TM 5-236

WAR DEPARTMENT

TECHNICAL MANUAL

SURVEYING TABLES

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TECHNICAL MANUAL

SURVEYING TABLES

CHANGES
No. 1

WAR DEPARTMENT,
WASHINGTON, July 29, 1942.

TM 5–236, July 10, 1940, is changed as follows:

Table No.	Page	Column	Line	Change—	To—
II	66	7	18	9. 80 485	9. 89 485
LIII	366	5	5	7. 69098	7. 69097
		2	9	0 30 32. 5	0 30 22. 5
	367	3	4	8. 72119	8. 72419
		3	9	8. 76260	8. 76261
		5	19	8. 83150	8. 83151
		6	19	1. 16850	1. 16849
		6	38	1. 06243	1. 06244
	368	5	25	9. 09109	9. 09110
		6	25	0. 90891	0. 90890
		4	42	9. 95577	9. 99577
	369	5	9	9. 19695	9. 19694
		6	9	0. 80305	0. 80306
	371	6	13	0. 57823	0. 57824
		5	24	9. 44011	9. 44041
		2	31	15 18 22. 5	15 48 22. 5
		3	39	9. 44705	9. 44706
	372	4	13	9. 97917	9. 97916
	373	6	4	0. 44000	0. 44100
		5	9	9. 56552	9. 56562
		3	25	9. 55617	9. 55618
	374	6	6	0. 37558	0. 37559
		3	11	9. 59339	9. 59399
		4	14	9. 96309	9. 96310
		5	17	9. 63740	9. 63739
		6	17	0. 36260	0. 36261
		5	26	9. 64781	9. 64782
		6	26	0. 35219	0. 35218
		5	29	9. 65125	9. 65126
		4	45	9. 95716	9. 95717
	375	3	8	9. 63814	9. 63813
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	377	3	45	9. 74152	9. 74153
	378	5	6	9. 83042	9. 83041
		6	6	0. 16958	0. 16959
		3	18	9. 75501	9. 75601
		3	23	9. 75096	9. 75906
		6	29	0. 14861	0. 14864
		5	39	9. 86037	9. 86036
		6	39	0. 13963	0. 13964
		2	43	36 10 06. 5	36 10 07. 5

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		3	50	9.80205	9.80236
		4	50	9.88839	9.88819
	380	4	0	9.88818	9.88819
		5	41	9.94957	9.94958
		6	41	0.05043	0.05042
	381	5	6	9.96242	9.96243
		4	33	9.85649	9.85661
LV	386	9	8	83224	83225
		8	13	68535	68536
		4	16	21426	21427
		6	27	44445	44444
		3	29	12663	12633
		7	34	57692	57691
		5	35	34019	35018
		7	35	57823	57822
		5	36	34129	34128
		7	36	57954	57953
		3	48	14532	14533
		3	51	14833	14834
	387	3	1	.14833	.14834
		4	13	.26305	.26304
		7	13	.61551	.61550
		3	14	.16141	.16140
		4	14	.26410	.26409
		6	29	.50706	.50705
		5	36	.39707	.39706
		6	41	.52196	.52195
		6	42	.52321	.52320

[A. G. 062.11 (6-9-42).] (C 1, July 29, 1942.)

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TABLE LV

NATURAL TANGENTS AND COTANGENTS OF ANGLES IN MILS

* * * * * * *

Tan	800	900	1000	1100	1200	1300	1400	1500	Mils
0	1.00000	1.21850	1.49661	1.87087	2.41421	3.29656	5.02734	10.15317	100
1	1.00197	1.22095	1.49979	1.87529	2.42093	3.30825	5.05326	10.25639	99
2	1.00393	1.22339	1.50299	1.87974	2.42769	3.32001	5.07944	10.36170	98
3	1.00591	1.22585	1.50619	1.88420	2.43447	3.33185	5.10589	10.46918	97
4	1.00788	1.22831	1.50940	1.88867	2.44129	3.34377	5.13260	10.57890	96
5	1.00987	1.23077	1.51263	1.89316	2.44813	3.35577	5.15958	10.69091	95
6	1.01185	1.23325	1.51586	1.89767	2.45502	3.36785	5.18683	10.80530	94
7	1.01384	1.23572	1.51910	1.90220	2.46193	3.38000	5.21437	10.92215	93
8	1.01583	1.23821	1.52235	1.90674	2.46888	3.39224	5.24218	11.04152	92
9	1.01783	1.24070	1.52562	1.91130	2.47586	3.40456	5.27029	11.16352	91
10	1.01983	1.24319	1.52889	1.91588	2.48288	3.41697	5.29869	11.28822	90
11	1.02184	1.24570	1.53217	1.92047	2.48993	3.42945	5.32738	11.41571	89
12	1.02384	1.24820	1.53546	1.92508	2.49702	3.44202	5.35638	11.54609	88
13	1.02586	1.25072	1.53876	1.92971	2.50414	3.45468	5.38568	11.67947	87
14	1.02787	1.25324	1.54207	1.93436	2.51129	3.46742	5.41530	11.81593	86
15	1.02989	1.25577	1.54540	1.93902	2.51849	3.48025	5.44523	11.95560	85
16	1.03192	1.25830	1.54873	1.94370	2.52571	3.49317	5.47548	12.09859	84
17	1.03395	1.26084	1.55207	1.94840	2.53297	3.50617	5.50606	12.24501	83
18	1.03598	1.26338	1.55542	1.95312	2.54027	3.51927	5.53697	12.39500	82
19	1.03802	1.26594	1.55878	1.95786	2.54761	3.53245	5.56822	12.54869	81
20	1.04006	1.26849	1.56215	1.96261	2.55498	3.54573	5.59981	12.70620	80
21	1.04211	1.27106	1.56554	1.96738	2.56239	3.55910	5.63176	12.86770	79
22	1.04416	1.27363	1.56893	1.97217	2.56984	3.57257	5.66406	13.03333	78
23	1.04621	1.27621	1.57233	1.97698	2.57732	3.58613	5.69671	13.20325	77
24	1.04827	1.27879	1.57575	1.98181	2.58484	3.59978	5.72974	13.37764	76
25	1.05033	1.28138	1.57917	1.98666	2.59240	3.61354	5.76314	13.55667	75
26	1.05240	1.28398	1.58261	1.99152	2.60000	3.62739	5.79692	13.74053	74
27	1.05447	1.28658	1.58605	1.99641	2.60764	3.64134	5.83109	13.92941	73
28	1.05655	1.28919	1.58951	2.00131	2.61532	3.65538	5.86565	14.12354	72
29	1.05863	1.29181	1.59298	2.00624	2.62303	3.66953	5.90061	14.32312	71
30	1.06071	1.29443	1.59646	2.01118	2.63079	3.68379	5.93598	14.52839	70
31	1.06280	1.29706	1.59995	2.01614	2.63859	3.69814	5.97176	14.73961	69
32	1.06489	1.29970	1.60345	2.02113	2.64642	3.71260	6.00797	14.95703	68
33	1.06699	1.30234	1.60696	2.02613	2.65430	3.72717	6.04460	15.18093	67
34	1.06909	1.30499	1.61048	2.03115	2.66222	3.74185	6.08167	15.41160	66
35	1.07120	1.30765	1.61401	2.03619	2.67018	3.75663	6.11919	15.64936	65
36	1.07331	1.31031	1.61756	2.04125	2.67818	3.77152	6.15716	15.89454	64
37	1.07542	1.31298	1.62112	2.04634	2.68623	3.78652	6.19560	16.14750	63
38	1.07754	1.31566	1.62468	2.05144	2.69432	3.80163	6.23450	16.40860	62
39	1.07967	1.31835	1.62826	2.05656	2.70245	3.81686	6.27388	16.67826	61
40	1.08179	1.32104	1.63185	2.06171	2.71062	3.83220	6.31375	16.95689	60
41	1.08393	1.32374	1.63545	2.06687	2.71884	3.84766	6.35412	17.24495	59
42	1.08606	1.32644	1.63907	2.07206	2.72710	3.86324	6.39499	17.54294	58
43	1.08821	1.32916	1.64269	2.07727	2.73540	3.87893	6.43638	17.85137	57
44	1.09035	1.33187	1.64633	2.08250	2.74375	3.89474	6.47830	18.17081	56
45	1.09250	1.33460	1.64998	2.08775	2.75215	3.91068	6.52076	18.50185	55
46	1.09466	1.33734	1.65364	2.09302	2.76059	3.92674	6.56376	18.84513	54
47	1.09682	1.34008	1.65731	2.09831	2.76907	3.94292	6.60732	19.20136	53
48	1.09899	1.34283	1.66099	2.10363	2.77761	3.95923	6.65144	19.57128	52
49	1.10116	1.34558	1.66469	2.10896	2.78619	3.97566	6.69615	19.95569	51
50	1.10333	1.34834	1.66840	2.11432	2.79481	3.99222	6.74145	20.35547	50
Mils	700	600	500	400	300	200	100	000	Cot

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TABLE LV.—*Natural tangents and cotangents of angles in mils*—Continued

Tan	800	900	1000	1100	1200	1300	1400	1500	Mils
50	1.10333	1.34834	1.66840	2.11432	2.79481	3.99222	6.74145	20.35547	50
51	1.10551	1.35111	1.67212	2.11970	2.80349	4.00892	6.78736	20.77155	49
52	1.10769	1.35389	1.67585	2.12511	2.81221	4.02574	6.83387	21.20495	48
53	1.10988	1.35668	1.67960	2.13053	2.82098	4.04270	6.88102	21.65678	47
54	1.11208	1.35947	1.68336	2.13598	2.82980	4.05980	6.92881	22.12824	46
55	1.11427	1.36227	1.68713	2.14146	2.83867	4.07703	6.97725	22.62064	45
56	1.11648	1.36508	1.69091	2.14695	2.84758	4.09440	7.02637	23.13541	44
57	1.11868	1.36789	1.69470	2.15247	2.85655	4.11191	7.07616	23.67410	43
58	1.12090	1.37071	1.69851	2.15801	2.86557	4.12956	7.12665	24.23844	42
59	1.12312	1.37354	1.70233	2.16358	2.87464	4.14736	7.17785	24.83028	41
60	1.12534	1.37638	1.70616	2.16917	2.88376	4.16530	7.22978	25.45170	40
61	1.12757	1.37923	1.71001	2.17478	2.89293	4.18339	7.28245	26.10497	39
62	1.12980	1.38208	1.71387	2.18042	2.90215	4.20163	7.33588	26.79261	38
63	1.13203	1.38494	1.71774	2.18608	2.91143	4.22002	7.39009	27.51739	37
64	1.13428	1.38781	1.72163	2.19176	2.92076	4.23856	7.44509	28.28243	36
65	1.13652	1.39069	1.72552	2.19748	2.93014	4.25725	7.50089	29.09116	35
66	1.13878	1.39357	1.72944	2.20321	2.93958	4.27611	7.55753	29.94745	34
67	1.14103	1.39646	1.73336	2.20897	2.94908	4.29512	7.61501	30.85561	33
68	1.14330	1.39936	1.73730	2.21475	2.95862	4.31430	7.67336	31.82052	32
69	1.14556	1.40227	1.74125	2.22056	2.96823	4.33363	7.73259	32.84765	31
70	1.14784	1.40519	1.74522	2.22640	2.97789	4.35313	7.79273	33.94324	30
71	1.15011	1.40811	1.74919	2.23226	2.98760	4.37280	7.85380	35.11436	29
72	1.15240	1.41104	1.75319	2.23815	2.99738	4.39264	7.91581	36.36911	28
73	1.15469	1.41399	1.75719	2.24406	3.00721	4.41266	7.97880	37.71678	27
74	1.15698	1.41693	1.76121	2.25000	3.01710	4.43284	8.04278	39.16809	26
75	1.15928	1.41989	1.76525	2.25596	3.02704	4.45320	8.10779	40.73548	25
76	1.16158	1.42286	1.76929	2.26196	3.03705	4.47374	8.17383	42.43346	24
77	1.16389	1.42583	1.77336	2.26797	3.04712	4.49446	8.24094	44.27907	23
78	1.16620	1.42881	1.77743	2.27402	3.05725	4.51537	8.30915	46.29242	22
79	1.16852	1.43180	1.78152	2.28009	3.06743	4.53646	8.37848	48.49749	21
80	1.17085	1.43480	1.78563	2.28619	3.07768	4.55774	8.44896	50.92304	20
81	1.17318	1.43781	1.78975	2.29232	3.08800	4.57921	8.52062	53.60387	19
82	1.17552	1.44082	1.79388	2.29847	3.09837	4.60088	8.59348	56.58253	18
83	1.17786	1.44385	1.79803	2.30465	3.10881	4.62274	8.66759	59.91159	17
84	1.18020	1.44688	1.80219	2.31086	3.11931	4.64480	8.74297	63.65674	16
85	1.18256	1.44992	1.80637	2.31710	3.12988	4.66707	8.81965	67.90120	15
86	1.18491	1.45297	1.81056	2.32337	3.14051	4.68954	8.89768	72.75196	14
87	1.18728	1.45603	1.81477	2.32966	3.15121	4.71221	8.97708	78.34895	13
88	1.18964	1.45910	1.81899	2.33599	3.16197	4.73510	9.05789	84.87871	12
89	1.19203	1.46217	1.82323	2.34234	3.17280	4.75820	9.14015	92.59564	11
90	1.19440	1.46526	1.82748	2.34873	3.18370	4.78152	9.22390	101.8559	10
91	1.19678	1.46835	1.83175	2.35514	3.19467	4.80506	9.30918	113.1739	9
92	1.19917	1.47146	1.83604	2.36158	3.20570	4.82882	9.39603	127.3213	8
93	1.20157	1.47457	1.84033	2.36805	3.21681	4.85280	9.48451	145.5108	7
94	1.20397	1.47769	1.84465	2.37455	3.22798	4.87702	9.57464	169.7633	6
95	1.20638	1.48082	1.84898	2.38109	3.23923	4.90147	9.66649	203.7167	5
96	1.20879	1.48396	1.85333	2.38765	3.25055	4.92616	9.76009	254.6466	4
97	1.21121	1.48711	1.85769	2.39424	3.26194	4.95108	9.85551	339.5296	3
98	1.21364	1.49026	1.86206	2.40087	3.27341	4.97625	9.95279	509.2952	2
99	1.21607	1.49343	1.86646	2.40753	3.28495	5.00167	10.0520	1018.591	1
100	1.21850	1.49661	1.87087	2.41421	3.29656	5.02734	10.1532	∞	0
Mils	700	600	500	400	300	200	100	000	Cot

[A. G. 062.11 (6-9-42).] (C1, July 29, 1942.)

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

U. S. GOVERNMENT PRINTING OFFICE: 1942

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TM 5–236
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TECHNICAL MANUAL

SURVEYING TABLES

CHANGES No. 2

WAR DEPARTMENT,
WASHINGTON 25, D. C., 7 September 1944.

TM 5–236, 10 July 1940, is changed as follows:

SUMMARY OF TABLES

* * * * * * *

Table VIII.—Coefficients for temperature corrections, barometric: Barometric coefficients to four places of decimals for every ten degrees from 0° to 180° Fahrenheit.

* * * * * * *

TABLE VIII (Superseded)

COEFFICIENTS (C) FOR TEMPERATURE CORRECTIONS, BAROMETRIC

(Argument $(t+t')$ = sum of temperatures in degrees Fahrenheit at the two stations)

$t+t'$ (Fahrenheit)	Coefficient C	$t+t'$ (Fahrenheit)	Coefficient C	$t+t'$ (Fahrenheit)	Coefficient C
°		°		°	
0	−0. 1024	60	−0. 0380	120	+0. 0262
10	−0. 0915	70	−0. 0273	130	+0. 0368
20	−0. 0806	80	−0. 0166	140	+0. 0472
30	−0. 0698	90	−0. 0058	150	+0. 0575
40	−0. 0592	100	+0. 0049	160	+0. 0677
50	−0. 0486	110	+0. 0156	170	+0. 0779
60	−0. 0380	120	+0. 0262	180	+0. 0879

Table No.	Page	Column	Line	Change—	To—
II	66	10	[1] 16	1. 8	4. 8
XLI	244	9	65	28. 6653	28. 6356
LI	261	8	32	131226	121226
	264	5	7	4259	2459
	264	13	15	3763	3673
	265	10	11	32592	32602
	265	13	10	3881	5881
	265	13	18	3938	5938
	266	5	14	6791	6793
	267	5	9	9843	9841
	268	5	52	14997	14197
	270	4	3	9646	8646
	270	9	26	36879	26879
	270	4	38	8240	8340
	271	5	7	33680	31580
	271	13	8	27595	37595
	271	11	24	39417	36417
	271	7	45	39901	33901
	273	9	39	60538	60533
	274	9	55	85100	85109
	275	13	18	199082	190282
	275	13	21	193522	193422
	275	13	56	283304	283730
LVI	391	3	15	89 18. 75	79 18. 75

[1] 3 of Prop. Pts.

AGO 131C—598803°—44

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SURVEYING TABLES

[A. G. 300.7 (24 Aug 44).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

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IB 6: T/O & E 6-10, 6-110, 6-150, 6-160, 6-200, 6-270T.

IR 5: T/O & E 5-21, 5-251, 5-411.

IBn 5: T/O & E 5-15, 5-35, 5-55, 5-75, 5-95, 5-115, 5-215, 5-225, 5-235, 5-275, 5-385, 5-455, 5-465, 5-475T.

IBn 6: T/O & E 6-35, 6-55, 6-65, 6-75, 6-145, 6-45, 6-325, 6-355, 6-365, 6-395, 6-95.

IC 5: T/O & E 5-87, 5-88, 5-167, 5-186, 5-187, 5-188, 5-189, 5-327, 5-400 Aviation Topographic Orgn, Bn Hq AA, Hq Plat Hq & Sv Co AB, Hq Plat Photomapping Co AC, Hq Plat Reprod AD, Hq Plat Engr Aviation AE, Operation Sec Topo Co AF, Photoprinting Sec Topo Co AG, Geodetic Control Plat AM; 5-500 Engr Sv Orgn, Plat Hq Sep AA, Co Hq AB, Bn Hq AC, Survey Liaison Det OA; 5-627.

IC 6: T/O & E 6-12, 6-20-1, 6-50-1, 6-78S, 6-212-S, 6-270 IT, 6-277T.

For explanation of symbols, see FM 21-6.

AGO 131C
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TECHNICAL MANUAL
No. 5–236

WAR DEPARTMENT,
WASHINGTON, *July 10, 1940.*

SURVEYING TABLES

Prepared under direction of the Chief of Engineers

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TABLE I

COMMON LOGARITHMS OF NUMBERS

1. **Mantissa.**—The mantissa or decimal part of a logarithm is always positive, and depends only upon the digits of a number. It remains unchanged as long as the sequence of the digits remains unchanged.

2. **Characteristic.**—*a.* For numbers greater than unity, the characteristic or integral part of the logarithm is one less than the number of integral digits and is always positive. Thus:

$$\text{Log } 1359 = 3.13322$$
$$\text{Log } 135.9 = 2.13322$$
$$\text{Log } 13.59 = 1.13322$$
$$\text{Log } 1.359 = 0.13322$$

b. For numbers less than unity, the characteristic is negative. It is one more than the number of ciphers between the decimal point and the first significant figure. Since the mantissa is positive, the negative sign is placed above the characteristic to show that it only is negative. Thus:

$$\text{Log } 0.1359 = \bar{1}.13322 \text{ or } 9.13322-10$$
$$\text{Log } 0.01359 = \bar{2}.13322 \text{ or } 8.13322-10$$
$$\text{Log } 0.001359 = \bar{3}.13322 \text{ or } 7.13322-10$$
$$\text{Log } 0.0001359 = \bar{4}.13322 \text{ or } 6.13322-10$$

3. **Multiplication and division of numbers by logarithms.**—Since logarithms are exponents, the logarithm of a product is the sum of the logarithm of the factors. Thus:

$$\text{Log } 20 = \log (10 \times 2) = \log 10 + \log 2 = 0.30103 + 1.00000 = 1.30103$$
$$\text{Log } 2000 = \log (2 \times 1000) = \log 2 + \log 1000 = 0.30103 + 3.00000 = 3.30103$$
$$\text{Log } 0.2 = \log (2 \times 0.1) = \log 2 + \log 0.1 = 0.30103 + \bar{1}.00000 = \bar{1}.30103 = 9.30103-10$$

$$\text{Log } 0.02 = \log (2 \times 0.01) = \log 2 + \log 0.01 = 0.30103$$
$$\bar{2}.00000 = \bar{2}.30103 = 8.30103 - 10$$

For division, the logarithms of the two numbers are substracted, the divisor being subtracted from the dividend.

4. **Powers and roots.**—The logarithm of any power of a number is equal to the logarithm of the number multiplied by the exponent of the power. The logarithm of the root of a number is equal to the logarithm of the number divided by the index of the root.

5. **Proportional parts.**—Suppose it is required to find the logarithm of 2245.7. First find the mantissa for 2245. This is 35122. Next find the mantissa of the next greater number, or 2246. This is 35141. The difference is:

$$\begin{array}{r} 35141 \\ 35122 \\ \hline 19 \end{array}$$

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Under the column head "Proportional parts," find that group headed by 19. Since 2245.7 is seven-tenths greater than 2245, find the number opposite 7 in this group or 13.3. Add this to the mantissa of 2245 or

$$\begin{array}{r} 35122 \\ 13.3 \\ \hline 35135.3 \end{array} = \text{mantissa of } 22457.$$

The logarithm of 2245.7 is, therefore, 3.351353.

If it is required to find a number, given a logarithm, the method is reversed. Thus, suppose it is required to find the number whose logarithm is 3.35135. This mantissa cannot be found in the table. Therefore, find the two mantissas between which the given mantissa lies. They are 35122 and 35141. The difference between them is 19. The difference between the smaller mantissa and that given is—

$$\begin{array}{r} 35135 \\ 35122 \\ \hline 13 \end{array}$$

Then find what number is opposite 13 in the group of proportional parts headed by 19. This is found to be 7. The number required is therefore 2245.7.

Had the given logarithm above been 35136, the difference would have been 14 instead of 13. Since 14 does not appear in the column of proportional parts, take the number closest thereto. In this case 13.3 is closer to 14 than is 15.2, so that line would be used giving the number 2245.7, same as above.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L. 0	1	2	3	4	5	6	7	8	9
0		00 000	30 103	47 712	60 206	69 897	77 815	84 510	90 309	95 424
1	00 000	04 139	07 918	11 394	14 613	17 609	20 412	23 045	25 527	27 875
2	30 103	32 222	34 242	36 173	38 021	39 794	41 497	43 136	44 716	46 240
3	47 712	49 136	50 515	51 851	53 148	54 407	55 630	56 820	57 978	59 106
4	60 206	61 278	62 325	63 347	64 345	65 321	66 276	67 210	68 124	69 020
5	69 897	70 757	71 600	72 428	73 239	74 036	74 819	75 587	76 343	77 085
6	77 815	78 533	79 239	79 934	80 618	81 291	81 954	82 607	83 251	83 885
7	84 510	85 126	85 733	86 332	86 923	87 506	88 081	88 649	89 209	89 763
8	90 309	90 849	91 381	91 908	92 428	92 942	93 450	93 952	94 448	94 939
9	95 424	95 904	96 379	96 848	97 313	97 772	98 227	98 677	99 123	99 564
10	00 000	00 432	00 860	01 284	01 703	02 119	02 531	02 938	03 342	03 743
11	04 139	04 532	04 922	05 308	05 690	06 070	06 446	06 819	07 188	07 555
12	07 918	08 279	08 636	08 991	09 342	09 691	10 037	10 380	10 721	11 059
13	11 394	11 727	12 057	12 385	12 710	13 033	13 354	13 672	13 988	14 301
14	14 613	14 922	15 229	15 534	15 836	16 137	16 435	16 732	17 026	17 319
15	17 609	17 898	18 184	18 469	18 752	19 033	19 312	19 590	19 866	20 140
16	20 412	20 683	20 952	21 219	21 484	21 748	22 011	22 272	22 531	22 789
17	23 045	23 300	23 553	23 805	24 055	24 304	24 551	24 797	25 042	25 285
18	25 527	25 768	26 007	26 245	26 482	26 717	26 951	27 184	27 416	27 646
19	27 875	28 103	28 330	28 556	28 780	29 003	29 226	29 447	29 667	29 885
20	30 103	30 320	30 535	30 750	30 963	31 175	31 387	31 597	31 806	32 015
21	32 222	32 428	32 634	32 838	33 041	33 244	33 445	33 646	33 846	34 044
22	34 242	34 439	34 635	34 830	35 025	35 218	35 411	35 603	35 793	35 984
23	36 173	36 361	36 549	36 736	36 922	37 107	37 291	37 475	37 658	37 840
24	38 021	38 202	38 382	38 561	38 739	38 917	39 094	39 270	39 445	39 620
25	39 794	39 967	40 140	40 312	40 483	40 654	40 824	40 993	41 162	41 330
26	41 497	41 664	41 830	41 996	42 160	42 325	42 488	42 651	42 813	42 975
27	43 136	43 297	43 457	43 616	43 775	43 933	44 091	44 248	44 404	44 560
28	44 716	44 871	45 025	45 179	45 332	45 484	45 637	45 788	45 939	46 090
29	46 240	46 389	46 538	46 687	46 835	46 982	47 129	47 276	47 422	47 567
30	47 712	47 857	48 001	48 144	48 287	48 430	48 572	48 714	48 855	48 996
31	49 136	49 276	49 415	49 554	49 693	49 831	49 969	50 106	50 243	50 379
32	50 515	50 651	50 786	50 920	51 055	51 188	51 322	51 455	51 587	51 720
33	51 851	51 983	52 114	52 244	52 375	52 504	52 634	52 763	52 892	53 020
34	53 148	53 275	53 403	53 529	53 656	53 782	53 908	54 033	54 158	54 283
35	54 407	54 531	54 654	54 777	54 900	55 023	55 145	55 267	55 388	55 509
36	55 630	55 751	55 871	55 991	56 110	56 229	56 348	56 467	56 585	56 703
37	56 820	56 937	57 054	57 171	57 287	57 403	57 519	57 634	57 749	57 864
38	57 978	58 092	58 206	58 320	58 433	58 546	58 659	58 771	58 883	58 995
39	59 106	59 218	59 329	59 439	59 550	59 660	59 770	59 879	59 988	60 097
40	60 206	60 314	60 423	60 531	60 638	60 746	60 853	60 959	61 066	61 172
41	61 278	61 384	61 490	61 595	61 700	61 805	61 909	62 014	62 118	62 221
42	62 325	62 428	62 531	62 634	62 737	62 839	62 941	63 043	63 144	63 246
43	63 347	63 448	63 548	63 649	63 749	63 849	63 949	64 048	64 147	64 246
44	64 345	64 444	64 542	64 640	64 738	64 836	64 933	65 031	65 128	65 225
45	65 321	65 418	65 514	65 610	65 706	65 801	65 896	65 992	66 087	66 181
46	66 276	66 370	66 464	66 558	66 652	66 745	66 839	66 932	67 025	67 117
47	67 210	67 302	67 394	67 486	67 578	67 669	67 761	67 852	67 943	68 034
48	68 124	68 215	68 305	68 395	68 485	68 574	68 664	68 753	68 842	68 931
49	69 020	69 108	69 197	69 285	69 373	69 461	69 548	69 636	69 723	69 810
50	69 897	69 984	70 070	70 157	70 243	70 329	70 415	70 501	70 586	70 672
N.	L. 0	1	2	3	4	5	6	7	8	9

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L. 0	1	2	3	4	5	6	7	8	9
50	69 897	69 984	70 070	70 157	70 243	70 329	70 415	70 501	70 586	70 672
51	70 757	70 842	70 927	71 012	71 096	71,181	71 265	71 349	71 433	71 517
52	71 600	71 684	71 767	71 850	71 933	72 016	72 099	72 181	72 263	72 346
53	72 428	72 509	72 591	72 673	72 754	72 835	72 916	72 997	73 078	73 159
54	73 239	73 320	73 400	73 480	73 560	73 640	73 719	73 799	73 878	73 957
55	74 036	74 115	74 194	74 273	74 351	74 429	74 507	74 586	74 663	74 741
56	74 819	74 896	74 974	75 051	75 128	75 205	75 282	75 358	75 435	75 511
57	75 587	75 664	75 740	75 815	75 891	75 967	76 042	76 118	76 193	76 268
58	76 343	76 418	76 492	76 567	76 641	76 716	76 790	76 864	76 938	77 012
59	77 085	77 159	77 232	77 305	77 379	77 452	77 525	77 597	77 670	77 743
60	77 815	77 887	77 960	78 032	78 104	78 176	78 247	78 319	78 390	78 462
61	78 533	78 604	78 675	78 746	78 817	78 888	78 958	79 029	79 099	79 169
62	79 239	79 309	79 379	79 449	79 518	79 588	79 657	79 727	79 796	79 865
63	79 934	80 003	80 072	80 140	80 209	80 277	80 346	80 414	80 482	80 550
64	80 618	80 686	80 754	80 821	80 889	80 956	81 023	81 090	81 158	81 224
65	81 291	81 358	81 425	81 491	81 558	81 624	81 690	81 757	81 823	81 889
66	81 954	82 020	82 086	82 151	82 217	82 282	82 347	82 413	82 478	82 543
67	82 607	82 672	82 737	82 802	82 866	82 930	82 995	83 059	83 123	83 187
68	83 251	83 315	83 378	83 442	83 506	83 569	83 632	83 696	83 759	83 822
69	83 885	83 948	84 011	84 073	84 136	84 198	84 261	84 323	84 386	84 448
70	84 510	84 572	84 634	84 696	84 757	84 819	84 880	84 942	85 003	85 065
71	85 126	85 187	85 248	85 309	85 370	85 431	85 491	85 552	85 612	85 673
72	85 733	85 794	85 854	85 914	85 974	86 034	86 094	86 153	86 213	86 273
73	86 332	86 392	86 451	86 510	86 570	86 629	86 688	86 747	86 806	86 864
74	86 923	86 982	87 040	87 099	87 157	87 216	87 274	87 332	87 390	87 448
75	87 506	87 564	87 622	87 679	87 737	87 795	87 852	87 910	87 967	88 024
76	88 081	88 138	88 195	88 252	88 309	88 366	88 423	88 480	88 536	88 593
77	88 649	88 705	88 762	88 818	88 874	88 930	88 986	89 042	89 098	89 154
78	89 209	89 265	89 321	89 376	89 432	89 487	89 542	89 597	89 653	89 708
79	89 763	89 818	89 873	89 927	89 982	90 037	90 091	90 146	90 200	90 255
80	90 309	90 363	90 417	90 472	90 526	90 580	90 634	90 687	90 741	90 795
81	90 849	90 902	90 956	91 009	91 062	91 116	91 169	91 222	91 275	91 328
82	91 381	91 434	91 487	91 540	91 593	91 645	91 698	91 751	91 803	91 855
83	91 908	91 960	92 012	92 065	92 117	92 169	92 221	92 273	92 324	92 376
84	92 428	92 480	92 531	92 583	92 634	92 686	92 737	92 788	92 840	92 891
85	92 942	92 993	93 044	93 095	93 146	93 197	93 247	93 298	93 349	93 399
86	93 450	93 500	93 551	93 601	93 651	93 702	93 752	93 802	93 852	93 902
87	93 952	94 002	94 052	94 101	94 151	94 201	94 250	94 300	94 349	94 399
88	94 448	94 498	94 547	94 596	94 645	94 694	94 743	94 792	94 841	94 890
89	94 939	94 988	95 036	95 085	95 134	95 182	95 231	95 279	95 328	95 376
90	95 424	95 472	95 521	95 569	95 617	95 665	95 713	95 761	95 809	95 856
91	95 904	95 952	95 999	96 047	96 095	96 142	96 190	96 237	96 284	96 332
92	96 379	96 426	96 473	96 520	96 567	96 614	96 661	96 708	96 755	96 802
93	96 848	96 895	96 942	96 988	97 035	97 081	97 128	97 174	97 220	97 267
94	97 313	97 359	97 405	97 451	97 497	97 543	97 589	97 635	97 681	97 727
95	97 772	97 818	97 864	97 909	97 955	98 000	98 046	98 091	98 137	98 182
96	98 227	98 272	98 318	98 363	98 408	98 453	98 498	98 543	98 588	98 632
97	98 677	98 722	98 767	98 811	98 856	98 900	98 945	98 989	99 034	99 078
98	99 123	99 167	99 211	99 255	99 300	99 344	99 388	99 432	99 476	99 520
99	99 564	99 607	99 651	99 695	99 739	99 782	99 826	99 870	99 913	99 957
100	00 000	00 043	00 087	00 130	00 173	00 217	00 260	00 303	00 346	00 389
N.	L. 0	1	2	3	4	5	6	7	8	9

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.		
100	00	000	043	087	130	173	217	260	303	346	389			
101		432	475	518	561	604	647	689	732	775	817		**44**	**43**	**42**
102		860	903	945	988	*030	*072	*115	*157	*199	*242	1	4,4	4,3	4,2
103	01	284	326	368	410	452	494	536	578	620	662	2	8,8	8,6	8,4
104		703	745	787	828	870	912	953	995	*036	*078	3	13,2	12,9	12,6
105	02	119	160	202	243	284	325	366	407	449	490	4	17,6	17,2	16,8
106		531	572	612	653	694	735	776	816	857	898	5	22,0	21,5	21,0
107		938	979	*019	*060	*100	*141	*181	*222	*262	*302	6	26,4	25,8	25,2
108	03	342	383	423	463	503	543	583	623	663	703	7	30,8	30,1	29,4
109		743	782	822	862	902	941	981	*021	*060	*100	8	35,2	34,4	33,6
110	04	139	179	218	258	297	336	376	415	454	493	9	39,6	38,7	37,8
111		532	571	610	650	689	727	766	805	844	883		**41**	**40**	**39**
112		922	961	999	*038	*077	*115	*154	*192	*231	*269	1	4,1	4,0	3,9
113	05	308	346	385	423	461	500	538	576	614	652	2	8,2	8,0	7,8
114		690	729	767	805	843	881	918	956	994	*032	3	12,3	12,0	11,7
115	06	070	108	145	183	221	258	296	333	371	408	4	16,4	16,0	15,6
116		446	483	521	558	595	633	670	707	744	781	5	20,5	20,0	19,5
117		819	856	893	930	967	*004	*041	*078	*115	*151	6	24,6	24,0	23,4
118	07	188	225	262	298	335	372	408	445	482	518	7	28,7	28,0	27,3
119		555	591	628	664	700	737	773	809	846	882	8	32,8	32,0	31,2
120		918	954	990	*027	*063	*099	*135	*171	*207	*243	9	36,9	36,0	35,1
121	08	279	314	350	386	422	458	493	529	565	600		**38**	**37**	**36**
122		636	672	707	743	778	814	849	884	920	955	1	3,8	3,7	3,6
123		991	*026	*061	*096	*132	*167	*202	*237	*272	*307	2	7,6	7,4	7,2
124	09	342	377	412	447	482	517	552	587	621	656	3	11,4	11,1	10,8
125		691	726	760	795	830	864	899	934	968	*003	4	15,2	14,8	14,4
126	10	037	072	106	140	175	209	243	278	312	346	5	19,0	18,5	18,0
127		380	415	449	483	517	551	585	619	653	687	6	22,8	22,2	21,6
128		721	755	789	823	857	890	924	958	992	*025	7	26,6	25,9	25,2
129	11	059	093	126	160	193	227	261	294	327	361	8	30,4	29,6	28,8
130		394	428	461	494	528	561	594	628	661	694	9	34,2	33,3	32,4
131		727	760	793	826	860	893	926	959	992	*024		**35**	**34**	**33**
132	12	057	090	123	156	189	222	254	287	320	352	1	3,5	3,4	3,3
133		385	418	450	483	516	548	581	613	646	678	2	7,0	6,8	6,6
134		710	743	775	808	840	872	905	937	969	*001	3	10,5	10,2	9,9
135	13	033	066	098	130	162	194	226	258	290	322	4	14,0	13,6	13,2
136		354	386	418	450	481	513	545	577	609	640	5	17,5	17,0	16,5
137		672	704	735	767	799	830	862	893	925	956	6	21,0	20,4	19,8
138		988	*019	*051	*082	*114	*145	*176	*208	*239	*270	7	24,5	23,8	23,1
139	14	301	333	364	395	426	457	489	520	551	582	8	28,0	27,2	26,4
140		613	644	675	706	737	768	799	829	860	891	9	31,5	30,6	29,7
141		922	953	983	*014	*045	*076	*106	*137	*168	*198		**32**	**31**	**30**
142	15	229	259	290	320	351	381	412	442	473	503	1	3,2	3,1	3,0
143		534	564	594	625	655	685	715	746	776	806	2	6,4	6,2	6,0
144		836	866	897	927	957	987	*017	*047	*077	*107	3	9,6	9,3	9,0
145	16	137	167	197	227	256	286	316	346	376	406	4	12,8	12,4	12,0
146		435	465	495	524	554	584	613	643	673	702	5	16,0	15,5	15,0
147		732	761	791	820	850	879	909	938	967	997	6	19,2	18,6	18,0
148	17	026	056	085	114	143	173	202	231	260	289	7	22,4	21,7	21,0
149		319	348	377	406	435	464	493	522	551	580	8	25,6	24,8	24,0
150		609	638	667	696	725	754	782	811	840	869	9	28,8	27,9	27,0
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.		

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
150	17	609	638	667	696	725	754	782	811	840	869	
151		898	926	955	984	*013	*041	*070	*099	*127	*156	**29** **28**
152	18	184	213	241	270	298	327	355	384	412	441	1 2,9 2,8
153		469	498	526	554	583	611	639	667	696	724	2 5,8 5,6
154		752	780	808	837	865	893	921	949	977	*005	3 8,7 8,4
155	19	033	061	089	117	145	173	201	229	257	285	4 11,6 11,2
156		312	340	368	396	424	451	479	507	535	562	5 14,5 14,0
157		590	618	645	673	700	728	756	783	811	838	6 17,4 16,8
158		866	893	921	948	976	*003	*030	*058	*085	*112	7 20,3 19,6
159	20	140	167	194	222	249	276	303	330	358	385	8 23,2 22,4
160		412	439	466	493	520	548	575	602	629	656	9 26,1 25,2
161		683	710	737	763	790	817	844	871	898	925	
162		952	978	*005	*032	*059	*085	*112	*139	*165	*192	**27** **26**
163	21	219	245	272	299	325	352	378	405	431	458	1 2,7 2,6
164		484	511	537	564	590	617	643	669	696	722	2 5,4 5,2
165		748	775	801	827	854	880	906	932	958	985	3 8,1 7,8
166	22	011	037	063	089	115	141	167	194	220	246	4 10,8 10,4
167		272	298	324	350	376	401	427	453	479	505	5 13,5 13,0
168		531	557	583	608	634	660	686	712	737	763	6 16,2 15,6
169		789	814	840	866	891	917	943	968	994	*019	7 18,9 18,2
170	23	045	070	096	121	147	172	198	223	249	274	8 21,6 20,8
171		300	325	350	376	401	426	452	477	502	528	9 24,3 23,4
172		553	578	603	629	654	679	704	729	754	779	
173		805	830	855	880	905	930	955	980	*005	*030	**25**
174	24	055	080	105	130	155	180	204	229	254	279	1 2,5
175		304	329	353	378	403	428	452	477	502	527	2 5,0
176		551	576	601	625	650	674	699	724	748	773	3 7,5
177		797	822	846	871	895	920	944	969	993	*018	4 10,0
178	25	042	066	091	115	139	164	188	212	237	261	5 12,5
179		285	310	334	358	382	406	431	455	479	503	6 15,0
180		527	551	575	600	624	648	672	696	720	744	7 17,5
181		768	792	816	840	864	888	912	935	959	983	8 20,0
182	26	007	031	055	079	102	126	150	174	198	221	9 22,5
183		245	269	293	316	340	364	387	411	435	458	
184		482	505	529	553	576	600	623	647	670	694	**24** **23**
185		717	741	764	788	811	834	858	881	905	928	1 2,4 2,3
186		951	975	998	*021	*045	*068	*091	*114	*138	*161	2 4,8 4,6
187	27	184	207	231	254	277	300	323	346	370	393	3 7,2 6,9
188		416	439	462	485	508	531	554	577	600	623	4 9,6 9,2
189		646	669	692	715	738	761	784	807	830	852	5 12,0 11,5
190		875	898	921	944	967	989	*012	*035	*058	*081	6 14,4 13,8
191	28	103	123	149	171	194	217	240	262	285	307	7 16,8 16,1
192		330	353	375	398	421	443	466	488	511	533	8 19,2 18,4
193		556	578	601	623	646	668	691	713	735	758	9 21,6 20,7
194		780	803	825	847	870	892	914	937	959	981	
195	29	003	026	048	070	092	115	137	159	181	203	**22** **21**
196		226	248	270	292	314	336	358	380	403	425	1 2,2 2,1
197		447	469	491	513	535	557	579	601	623	645	2 4,4 4,2
198		667	688	710	732	754	776	798	820	842	863	3 6,6 6,3
199		885	907	929	951	973	994	*016	*038	*060	*081	4 8,8 8,4
200	30	103	125	146	168	190	211	233	255	276	298	5 11,0 10,5
												6 13,2 12,6
												7 15,4 14,7
												8 17,6 16,8
												9 19,8 18,9
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
200	30	103	125	146	168	190	211	233	255	276	298	
201		320	341	363	384	406	428	449	471	492	514	**22** **21**
202		535	557	578	600	621	643	664	685	707	728	1 2,2 2,1
203		750	771	792	814	835	856	878	899	920	942	2 4,4 4,2
204		963	984	*006	*027	*048	*069	*091	*112	*133	*154	3 6,6 6,3
205	31	175	197	218	239	260	281	302	323	345	366	4 8,8 8,4
206		387	408	429	450	471	492	513	534	555	576	5 11,0 10,5
207		597	618	639	660	681	702	723	744	765	785	6 13,2 12,6
208		806	827	848	869	890	911	931	952	973	994	7 15,4 14,7
209	32	015	035	056	077	098	118	139	160	181	201	8 17,6 16,8
												9 19,8 18,9
210		222	243	263	284	305	325	346	366	387	408	
211		428	449	469	490	510	531	552	572	593	613	**20**
212		634	654	675	695	715	736	756	777	797	818	1 2,0
213		838	858	879	899	919	940	960	980	*001	*021	2 4,0
214	33	041	062	082	102	122	143	163	183	203	224	3 6,0
215		244	264	284	304	325	345	365	385	405	425	4 8,0
216		445	465	486	506	526	546	566	586	606	626	5 10,0
217		646	666	686	706	726	746	766	786	806	826	6 12,0
218		846	866	885	905	925	945	965	985	*005	*025	7 14,0
219	34	044	064	084	104	124	143	163	183	203	223	8 16,0
												9 18,0
220		242	262	282	301	321	341	361	380	400	420	
221		439	459	479	498	518	537	557	577	596	616	**19**
222		635	655	674	694	713	733	753	772	792	811	1 1,9
223		830	850	869	889	908	928	947	967	986	*005	2 3,8
224	35	025	044	064	083	102	122	141	160	180	199	3 5,7
225		218	238	257	276	295	315	334	353	372	392	4 7,6
226		411	430	449	468	488	507	526	545	564	583	5 9,5
227		603	622	641	660	679	698	717	736	755	774	6 11,4
228		793	813	832	851	870	889	908	927	946	965	7 13,3
229		984	*003	*021	*040	*059	*078	*097	*116	*135	*154	8 15,2
												9 17,1
230	36	173	192	211	229	248	267	286	305	324	342	
231		361	380	399	418	436	455	474	493	511	530	**18**
232		549	568	586	605	624	642	661	680	698	717	1 1,8
233		736	754	773	791	810	829	847	866	884	903	2 3,6
234		922	940	959	977	996	*014	*033	*051	*070	*088	3 5,4
235	37	107	125	144	162	181	199	218	236	254	273	4 7,2
236		291	310	328	346	365	383	401	420	438	457	5 9,0
237		475	493	511	530	548	566	585	603	621	639	6 10,8
238		658	676	694	712	731	749	767	785	803	822	7 12,6
239		840	858	876	894	912	931	949	967	985	*003	8 14,4
												9 16,2
240	38	021	039	057	075	093	112	130	148	166	184	
241		202	220	238	256	274	292	310	328	346	364	**17**
242		382	399	417	435	453	471	489	507	525	543	1 1,7
243		561	578	596	614	632	650	668	686	703	721	2 3,4
244		739	757	775	792	810	828	846	863	881	899	3 5,1
245		917	934	952	970	987	*005	*023	*041	*058	*076	4 6,8
246	39	094	111	129	146	164	182	199	217	235	252	5 8,5
247		270	287	305	322	340	358	375	393	410	428	6 10,2
248		445	463	480	498	515	533	550	568	585	602	7 11,9
249		620	637	655	672	690	707	724	742	759	777	8 13,6
												9 15,3
250		794	811	829	846	863	881	898	915	933	950	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
250	39	794	811	829	846	863	881	898	915	933	950	
251		967	985	*002	*019	*037	*054	*071	*088	*106	*123	**18**
252	40	140	157	175	192	209	226	243	261	278	295	1 | 1,8
253		312	329	346	364	381	398	415	432	449	466	2 | 3,6
254		483	500	518	535	552	569	586	603	620	637	3 | 5,4
255		654	671	688	705	722	739	756	773	790	807	4 | 7,2
256		824	841	858	875	892	909	926	943	960	976	5 | 9,0
257		993	*010	*027	*044	*061	*078	*095	*111	*128	*145	6 | 10,8
258	41	162	179	196	212	229	246	263	280	296	313	7 | 12,6
259		330	347	363	380	397	414	430	447	464	481	8 | 14,4
260		497	514	531	547	564	581	597	614	631	647	9 | 16,2
261		664	681	697	714	731	747	764	780	797	814	**17**
262		830	847	863	880	896	913	929	946	963	979	1 | 1,7
263		996	*012	*029	*045	*062	*078	*095	*111	*127	*144	2 | 3,4
264	42	160	177	193	210	226	243	259	275	292	308	3 | 5,1
265		325	341	357	374	390	406	423	439	455	472	4 | 6,8
266		488	504	521	537	553	570	586	602	619	635	5 | 8,5
267		651	667	684	700	716	732	749	765	781	797	6 | 10,2
268		813	830	846	862	878	894	911	927	943	959	7 | 11,9
269		975	991	*008	*024	*040	*056	*072	*088	*104	*120	8 | 13,6
270	43	136	152	169	185	201	217	233	249	265	281	9 | 15,3
271		297	313	329	345	361	377	393	409	425	441	**16**
272		457	473	489	505	521	537	553	569	584	600	1 | 1,6
273		616	632	648	664	680	696	712	727	743	759	2 | 3,2
274		775	791	807	823	838	854	870	886	902	917	3 | 4,8
275		933	949	965	981	996	*012	*028	*044	*059	*075	4 | 6,4
276	44	091	107	122	138	154	170	185	201	217	232	5 | 8,0
277		248	264	279	295	311	326	342	358	373	389	6 | 9,6
278		404	420	436	451	467	483	498	514	529	545	7 | 11,2
279		560	576	592	607	623	638	654	669	685	700	8 | 12,8
280		716	731	747	762	778	793	809	824	840	855	9 | 14,4
281		871	886	902	917	932	948	963	979	994	*010	**15**
282	45	025	040	056	071	086	102	117	133	148	163	1 | 1,5
283		179	194	209	225	240	255	271	286	301	317	2 | 3,0
284		332	347	362	378	393	408	423	439	454	469	3 | 4,5
285		484	500	515	530	545	561	576	591	606	621	4 | 6,0
286		637	652	667	682	697	712	728	743	758	773	5 | 7,5
287		788	803	818	834	849	864	879	894	909	924	6 | 9,0
288		939	954	969	984	*000	*015	*030	*045	*060	*075	7 | 10,5
289	46	090	105	120	135	150	165	180	195	210	225	8 | 12,0
290		240	255	270	285	300	315	330	345	359	374	9 | 13,5
291		389	404	419	434	449	464	479	494	509	523	**14**
292		538	553	568	583	598	613	627	642	657	672	1 | 1,4
293		687	702	716	731	746	761	776	790	805	820	2 | 2,8
294		835	850	864	879	894	909	923	938	953	967	3 | 4,2
295		982	997	*012	*026	*041	*056	*070	*085	*100	*114	4 | 5,6
296	47	129	144	159	173	188	202	217	232	246	261	5 | 7,0
297		276	290	305	319	334	349	363	378	392	407	6 | 8,4
298		422	436	451	465	480	494	509	524	538	553	7 | 9,8
299		567	582	596	611	625	640	654	669	683	698	8 | 11,2
300		712	727	741	756	770	784	799	813	828	842	9 | 12,6
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
300	47	712	727	741	756	770	784	799	813	828	842	
301		857	871	885	900	914	929	943	958	972	986	
302	48	001	015	029	044	058	073	087	101	116	130	
303		144	159	173	187	202	216	230	244	259	273	
304		287	302	316	330	344	359	373	387	401	416	**15**
305		430	444	458	473	487	501	515	530	544	558	1 | 1,5
306		572	586	601	615	629	643	657	671	686	700	2 | 3,0
307		714	728	742	756	770	785	799	813	827	841	3 | 4,5
308		855	869	883	897	911	926	940	954	968	982	4 | 6,0
309		996	*010	*024	*038	*052	*066	*080	*094	*108	*122	5 | 7,5
310	49	136	150	164	178	192	206	220	234	248	262	6 | 9,0
311		276	290	304	318	332	346	360	374	388	402	7 | 10,5
312		415	429	443	457	471	485	499	513	527	541	8 | 12,0
313		554	568	582	596	610	624	638	651	665	679	9 | 13,5
314		693	707	721	734	748	762	776	790	803	817	
315		831	845	859	872	886	900	914	927	941	955	
316		969	982	996	*010	*024	*037	*051	*065	*079	*092	**14**
317	50	106	120	133	147	161	174	188	202	215	229	1 | 1,4
318		243	256	270	284	297	311	325	338	352	365	2 | 2,8
319		379	393	406	420	433	447	461	474	488	501	3 | 4,2
320		515	529	542	556	569	583	596	610	623	637	4 | 5,6
321		651	664	678	691	705	718	732	745	759	772	5 | 7,0
322		786	799	813	826	840	853	866	880	893	907	6 | 8,4
323		920	934	947	961	974	987	*001	*014	*028	*041	7 | 9,8
324	51	055	068	081	095	108	121	135	148	162	175	8 | 11,2
325		188	202	215	228	242	255	268	282	295	308	9 | 12,6
326		322	335	348	362	375	388	402	415	428	441	
327		455	468	481	495	508	521	534	548	561	574	**13**
328		587	601	614	627	640	654	667	680	693	706	1 | 1,3
329		720	733	746	759	772	786	799	812	825	838	2 | 2,6
330		851	865	878	891	904	917	930	943	957	970	3 | 3,9
331		983	996	*009	*022	*035	*048	*061	*075	*088	*101	4 | 5,2
332	52	114	127	140	153	166	179	192	205	218	231	5 | 6,5
333		244	257	270	284	297	310	323	336	349	362	6 | 7,8
334		375	388	401	414	427	440	453	466	479	492	7 | 9,1
335		504	517	530	543	556	569	582	595	608	621	8 | 10,4
336		634	647	660	673	686	699	711	724	737	750	9 | 11,7
337		763	776	789	802	815	827	840	853	866	879	
338		892	905	917	930	943	956	969	982	994	*007	
339	53	020	033	046	058	071	084	097	110	122	135	**12**
340		148	161	173	186	199	212	224	237	250	263	1 | 1,2
341		275	288	301	314	326	339	352	364	377	390	2 | 2,4
342		403	415	428	441	453	466	479	491	504	517	3 | 3,6
343		529	542	555	567	580	593	605	618	631	643	4 | 4,8
344		656	668	681	694	706	719	732	744	757	769	5 | 6,0
345		782	794	807	820	832	845	857	870	882	895	6 | 7,2
346		908	920	933	945	958	970	983	995	*008	*020	7 | 8,4
347	54	033	045	058	070	083	095	108	120	133	145	8 | 9,6
348		158	170	183	195	208	220	233	245	258	270	9 | 10,8
349		283	295	307	320	332	345	357	370	382	394	
350		407	419	432	444	456	469	481	494	506	518	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
350	54	407	419	432	444	456	469	481	494	506	518	
351		531	543	555	568	580	593	605	617	630	642	
352		654	667	679	691	704	716	728	741	753	765	
353		777	790	802	814	827	839	851	864	876	888	**13**
354		900	913	925	937	949	962	974	986	998	*011	1 | 1,3
355	55	023	035	047	060	072	084	096	108	121	133	2 | 2,6
356		145	157	169	182	194	206	218	230	242	255	3 | 3,9
												4 | 5,2
357		267	279	291	303	315	328	340	352	364	376	5 | 6,5
358		388	400	413	425	437	449	461	473	485	497	6 | 7,8
359		509	522	534	546	558	570	582	594	606	618	7 | 9,1
												8 | 10,4
360		630	642	654	666	678	691	703	715	727	739	9 | 11,7
361		751	763	775	787	799	811	823	835	847	859	
362		871	883	895	907	919	931	943	955	967	979	
363		991	*003	*015	*027	*038	*050	*062	*074	*086	*098	
364	56	110	122	134	146	158	170	182	194	205	217	
365		229	241	253	265	277	289	301	312	324	336	
366		348	360	372	384	396	407	419	431	443	455	**12**
												1 | 1,2
367		467	478	490	502	514	526	538	549	561	573	2 | 2,4
368		585	597	608	620	632	644	656	667	679	691	3 | 3,6
369		703	714	726	738	750	761	773	785	797	808	4 | 4,8
												5 | 6,0
370		820	832	844	855	867	879	891	902	914	926	6 | 7,2
												7 | 8,4
371		937	949	961	972	984	996	*008	*019	*031	*043	8 | 9,6
372	57	054	066	078	089	101	113	124	136	148	159	9 | 10,8
373		171	183	194	206	217	229	241	252	264	276	
374		287	299	310	322	334	345	357	368	380	392	
375		403	415	426	438	449	461	473	484	496	507	
376		519	530	542	553	565	576	588	600	611	623	
377		634	646	657	669	680	692	703	715	726	738	**11**
378		749	761	772	784	795	807	818	830	841	852	1 | 1,1
379		864	875	887	898	910	921	933	944	955	967	2 | 2,2
												3 | 3,3
380		978	990	*001	*013	*024	*035	*047	*058	*070	*081	4 | 4,4
												5 | 5,5
381	58	092	104	115	127	138	149	161	172	184	195	6 | 6,6
382		206	218	229	240	252	263	274	286	297	309	7 | 7,7
383		320	331	343	354	365	377	388	399	410	422	8 | 8,8
												9 | 9,9
384		433	444	456	467	478	490	501	512	524	535	
385		546	557	569	580	591	602	614	625	636	647	
386		659	670	681	692	704	715	726	737	749	760	
387		771	782	794	805	816	827	838	850	861	872	
388		883	894	906	917	928	939	950	961	973	984	
389		995	*006	*017	*028	*040	*051	*062	*073	*084	*095	**10**
390	59	106	118	129	140	151	162	173	184	195	207	1 | 1,0
												2 | 2,0
391		218	229	240	251	262	273	284	295	306	318	3 | 3,0
392		329	340	351	362	373	384	395	406	417	428	4 | 4,0
393		439	450	461	472	483	494	506	517	528	539	5 | 5,0
												6 | 6,0
394		550	561	572	583	594	605	616	627	638	649	7 | 7,0
395		660	671	682	693	704	715	726	737	748	759	8 | 8,0
396		770	780	791	802	813	824	835	846	857	868	9 | 9,0
397		879	890	901	912	923	934	945	956	966	977	
398		988	999	*010	*021	*032	*043	*054	*065	*076	*086	
399	60	097	108	119	130	141	152	163	173	184	195	
400		206	217	228	239	249	260	271	282	293	304	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
400	60	206	217	228	239	249	260	271	282	293	304	
401		314	325	336	347	358	369	379	390	401	412	
402		423	433	444	455	466	477	487	498	509	520	
403		531	541	552	563	574	584	595	606	617	627	
404		638	649	660	670	681	692	703	713	724	735	
405		746	756	767	778	788	799	810	821	831	842	
406		853	863	874	885	895	906	917	927	938	949	**11**
407		959	970	981	991	*002	*013	*023	*034	*045	*055	1 | 1,1
408	61	066	077	087	098	109	119	130	140	151	162	2 | 2,2
409		172	183	194	204	215	225	236	247	257	268	3 | 3,3
410		278	289	300	310	321	331	342	352	363	374	4 | 4,4 5 | 5,5
411		384	395	405	416	426	437	448	458	469	479	6 | 6,6 7 | 7,7
412		490	500	511	521	532	542	553	563	574	584	8 | 8,8
413		595	606	616	627	637	648	658	669	679	690	9 | 9,9
414		700	711	721	731	742	752	763	773	784	794	
415		805	815	826	836	847	857	868	878	888	899	
416		909	920	930	941	951	962	972	982	993	*003	
417	62	014	024	034	045	055	066	076	086	097	107	
418		118	128	138	149	159	170	180	190	201	211	
419		221	232	242	252	263	273	284	294	304	315	
420		325	335	346	356	366	377	387	397	408	418	
421		428	439	449	459	469	480	490	500	511	521	**10**
422		531	542	552	562	572	583	593	603	613	624	1 | 1,0
423		634	644	655	665	675	685	696	706	716	726	2 | 2,0 3 | 3,0
424		737	747	757	767	778	788	798	808	818	829	4 | 4,0
425		839	849	859	870	880	890	900	910	921	931	5 | 5,0
426		941	951	961	972	982	992	*002	*012	*022	*033	6 | 6,0 7 | 7,0
427	63	043	053	063	073	083	094	104	114	124	134	8 | 8,0
428		144	155	165	175	185	195	205	215	225	236	9 | 9,0
429		246	256	266	276	286	296	306	317	327	337	
430		347	357	367	377	387	397	407	417	428	438	
431		448	458	468	478	488	498	508	518	528	538	
432		548	558	568	579	589	599	609	619	629	639	
433		649	659	669	679	689	699	709	719	729	739	
434		749	759	769	779	789	799	809	819	829	839	
435		849	859	869	879	889	899	909	919	929	939	
436		949	959	969	979	988	998	*008	*018	*028	*038	**9**
437	64	048	058	068	078	088	098	108	118	128	137	1 | 0,9
438		147	157	167	177	187	197	207	217	227	237	2 | 1,8
439		246	256	266	276	286	296	306	316	326	335	3 | 2,7 4 | 3,6
440		345	355	365	375	385	395	404	414	424	434	5 | 4,5 6 | 5,4
441		444	454	464	473	483	493	503	513	523	532	7 | 6,3
442		542	552	562	572	582	591	601	611	621	631	8 | 7,2
443		640	650	660	670	680	689	699	709	719	729	9 | 8,1
444		738	748	758	768	777	787	797	807	816	826	
445		836	846	856	865	875	885	895	904	914	924	
446		933	943	953	963	972	982	992	*002	*011	*021	
447	65	031	040	050	060	070	079	089	099	108	118	
448		128	137	147	157	167	176	186	196	205	215	
449		225	234	244	254	263	273	283	292	302	312	
450		321	331	341	350	360	369	379	389	398	408	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
450	65	321	331	341	350	360	369	379	389	398	408	
451		418	427	437	447	456	466	475	485	495	504	
452		514	523	533	543	552	562	571	581	591	600	
453		610	619	629	639	648	658	667	677	686	696	
454		706	715	725	734	744	753	763	772	782	792	
455		801	811	820	830	839	849	858	868	877	887	
456		896	906	916	925	935	944	954	963	973	982	**10**
457		992	*001	*011	*020	*030	*039	*049	*058	*068	*077	1 | 1,0
458	66	087	096	106	115	124	134	143	153	162	172	2 | 2,0
459		181	191	200	210	219	229	238	247	257	266	3 | 3,0
460		276	285	295	304	314	323	332	342	351	361	4 | 4,0 5 | 5,0
461		370	380	389	398	408	417	427	436	445	455	6 | 6,0 7 | 7,0
462		464	474	483	492	502	511	521	530	539	549	8 | 8,0
463		558	567	577	586	596	605	614	624	633	642	9 | 9,0
464		652	661	671	680	689	699	708	717	727	736	
465		745	755	764	773	783	792	801	811	820	829	
466		839	848	857	867	876	885	894	904	913	922	
467		932	941	950	960	969	978	987	997	*006	*015	
468	67	025	034	043	052	062	071	080	089	099	108	
469		117	127	136	145	154	164	173	182	191	201	
470		210	219	228	237	247	256	265	274	284	293	
471		302	311	321	330	339	348	357	367	376	385	**9**
472		394	403	413	422	431	440	449	459	468	477	1 | 0,9
473		486	495	504	514	523	532	541	550	560	569	2 | 1,8
474		578	587	596	605	614	624	633	642	651	660	3 | 2,7 4 | 3,6
475		669	679	688	697	706	715	724	733	742	752	5 | 4,5
476		761	770	779	788	797	806	815	825	834	843	6 | 5,4 7 | 6,3
477		852	861	870	879	888	897	906	916	925	934	8 | 7,2
478		943	952	961	970	979	988	997	*006	*015	*024	9 | 8,1
479	68	034	043	052	061	070	079	088	097	106	115	
480		124	133	142	151	160	169	178	187	196	205	
481		215	224	233	242	251	260	269	278	287	296	
482		305	314	323	332	341	350	359	368	377	386	
483		395	404	413	422	431	440	449	458	467	476	
484		485	494	502	511	520	529	538	547	556	565	
485		574	583	592	601	610	619	628	637	646	655	
486		664	673	681	690	699	708	717	726	735	744	**8**
487		753	762	771	780	789	797	806	815	824	833	1 | 0,8
488		842	851	860	869	878	886	895	904	913	922	2 | 1,6
489		931	940	949	958	966	975	984	993	*002	*011	3 | 2,4 4 | 3,2
490	69	020	028	037	046	055	064	073	082	090	099	5 | 4,0 6 | 4,8
491		108	117	126	135	144	152	161	170	179	188	7 | 5,6
492		197	205	214	223	232	241	249	258	267	276	8 | 6,4
493		285	294	302	311	320	329	338	346	355	364	9 | 7,2
494		373	381	390	399	408	417	425	434	443	452	
495		461	469	478	487	496	504	513	522	531	539	
496		548	557	566	574	583	592	601	609	618	627	
497		636	644	653	662	671	679	688	697	705	714	
498		723	732	740	749	758	767	775	784	793	801	
499		810	819	827	836	845	854	862	871	880	888	
500		897	906	914	923	932	940	949	958	966	975	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
500	69	897	906	914	923	932	940	949	958	966	975	
501		984	992	*001	*010	*018	*027	*036	*044	*053	*062	
502	70	070	079	088	096	105	114	122	131	140	148	
503		157	165	174	183	191	200	209	217	226	234	
504		243	252	260	269	278	286	295	303	312	321	
505		329	338	346	355	364	372	381	389	398	406	
506		415	424	432	441	449	458	467	475	484	492	
507		501	509	518	526	535	544	552	561	569	578	**9**
508		586	595	603	612	621	629	638	646	655	663	
509		672	680	689	697	706	714	723	731	740	749	1 | 0,9
510		757	766	774	783	791	800	808	817	825	834	2 | 1,8 3 | 2,7 4 | 3,6
511		842	851	859	868	876	885	893	902	910	919	5 | 4,5
512		927	935	944	952	961	969	978	986	995	*003	6 | 5,4
513	71	012	020	029	037	046	054	063	071	079	088	7 | 6,3 8 | 7,2
514		096	105	113	122	130	139	147	155	164	172	9 | 8,1
515		181	189	198	206	214	223	231	240	248	257	
516		265	273	282	290	299	307	315	324	332	341	
517		349	357	366	374	383	391	399	408	416	425	
518		433	441	450	458	466	475	483	492	500	508	
519		517	525	533	542	550	559	567	575	584	592	
520		600	609	617	625	634	642	650	659	667	675	
521		684	692	700	709	717	725	734	742	750	759	**8**
522		767	775	784	792	800	809	817	825	834	842	1 | 0,8
523		850	858	867	875	883	892	900	908	917	925	2 | 1,6 3 | 2,4
524		933	941	950	958	966	975	983	991	999	*008	4 | 3,2
525	72	016	024	032	041	049	057	066	074	082	090	5 | 4,0
526		099	107	115	123	132	140	148	156	165	173	6 | 4,8 7 | 5,6
527		181	189	198	206	214	222	230	239	247	255	8 | 6,4
528		263	272	280	288	296	304	313	321	329	337	9 | 7,2
529		346	354	362	370	378	387	395	403	411	419	
530		428	436	444	452	460	469	477	485	493	501	
531		509	518	526	534	542	550	558	567	575	583	
532		591	599	607	616	624	632	640	648	656	665	
533		673	681	689	697	705	713	722	730	738	746	
534		754	762	770	779	787	795	803	811	819	827	
535		835	843	852	860	868	876	884	892	900	908	
536		916	925	933	941	949	957	965	973	981	989	**7**
537		997	*006	*014	*022	*030	*038	*046	*054	*062	*070	1 | 0,7
538	73	078	086	094	102	111	119	127	135	143	151	2 | 1,4
539		159	167	175	183	191	199	207	215	223	231	3 | 2,1 4 | 2,8
540		239	247	255	263	272	280	288	296	304	312	5 | 3,5 6 | 4,2
541		320	328	336	344	352	360	368	376	384	392	7 | 4,9
542		400	408	416	424	432	440	448	456	464	472	8 | 5,6
543		480	488	496	504	512	520	528	536	544	552	9 | 6,3
544		560	568	576	584	592	600	608	616	624	632	
545		640	648	656	664	672	679	687	695	703	711	
546		719	727	735	743	751	759	767	775	783	791	
547		799	807	815	823	830	838	846	854	862	870	
548		878	886	894	902	910	918	926	933	941	949	
549		957	965	973	981	989	997	*005	*013	*020	*028	
550	74	036	044	052	060	068	076	084	092	099	107	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
550	74	036	044	052	060	068	076	084	092	099	107	
551		115	123	131	139	147	155	162	170	178	186	
552		194	202	210	218	225	233	241	249	257	265	
553		273	280	288	296	304	312	320	327	335	343	
554		351	359	367	374	382	390	398	406	414	421	
555		429	437	445	453	461	468	476	484	492	500	
556		507	515	523	531	539	547	554	562	570	578	
557		586	593	601	609	617	624	632	640	648	656	
558		663	671	679	687	695	702	710	718	726	733	
559		741	749	757	764	772	780	788	796	803	811	
560		819	827	834	842	850	858	865	873	881	889	
561		896	904	912	920	927	935	943	950	958	966	**8**
562		974	981	989	997	*005	*012	*020	*028	*035	*043	
563	75	051	059	066	074	082	089	097	105	113	120	1 | 0,8
564		128	136	143	151	159	166	174	182	189	197	2 | 1,6 3 | 2,4
565		205	213	220	228	236	243	251	259	266	274	4 | 3,2
566		282	289	297	305	312	320	328	335	343	351	5 | 4,0 6 | 4,8
567		358	366	374	381	389	397	404	412	420	427	7 | 5,6
568		435	442	450	458	465	473	481	488	496	504	8 | 6,4
569		511	519	526	534	542	549	557	565	572	580	9 | 7,2
570		587	595	603	610	618	626	633	641	648	656	
571		664	671	679	686	694	702	709	717	724	732	
572		740	747	755	762	770	778	785	793	800	808	
573		815	823	831	838	846	853	861	868	876	884	
574		891	899	906	914	921	929	937	944	952	959	
575		967	974	982	989	997	*005	*012	*020	*027	*035	
576	76	042	050	057	065	072	080	087	095	103	110	
577		118	125	133	140	148	155	163	170	178	185	
578		193	200	208	215	223	230	238	245	253	260	
579		268	275	283	290	298	305	313	320	328	335	
580		343	350	358	365	373	380	388	395	403	410	
581		418	425	433	440	448	455	462	470	477	485	**7**
582		492	500	507	515	522	530	537	545	552	559	
583		567	574	582	589	597	604	612	619	626	634	1 | 0,7 2 | 1,4
584		641	649	656	664	671	678	686	693	701	708	3 | 2,1
585		716	723	730	738	745	753	760	768	775	782	4 | 2,8
586		790	797	805	812	819	827	834	842	849	856	5 | 3,5 6 | 4,2.
587		864	871	879	886	893	901	908	916	923	930	7 | 4,9
588		938	945	953	960	967	975	982	989	997	*004	8 | 5,6
589	77	012	019	026	034	041	048	056	063	070	078	9 | 6,3
590		085	093	100	107	115	122	129	137	144	151	
591		159	166	173	181	188	195	203	210	217	225	
592		232	240	247	254	262	269	276	283	291	298	
593		305	313	320	327	335	342	349	357	364	371	
594		379	386	393	401	408	415	422	430	437	444	
595		452	459	466	474	481	488	495	503	510	517	
596		525	532	539	546	554	561	568	576	583	590	
597		597	605	612	619	627	634	641	648	656	663	
598		670	677	685	692	699	706	714	721	728	735	
599		743	750	757	764	772	779	786	793	801	808	
600		815	822	830	837	844	851	859	866	873	880	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
600	77	815	822	830	837	844	851	859	866	873	880	
601		887	895	902	909	916	924	931	938	945	952	
602		960	967	974	981	988	996	*003	*010	*017	*025	
603	78	032	039	046	053	061	068	075	082	089	097	
604		104	111	118	125	132	140	147	154	161	168	
605		176	183	190	197	204	211	219	226	233	240	
606		247	254	262	269	276	283	290	297	305	312	
607		319	326	333	340	347	355	362	369	376	383	8
608		390	398	405	412	419	426	433	440	447	455	1 | 0,8
609		462	469	476	483	490	497	504	512	519	526	2 | 1,6
610		533	540	547	554	561	569	576	583	590	597	3 | 2,4 4 | 3,2 5 | 4,0
611		604	611	618	625	633	640	647	654	661	668	6 | 4,8
612		675	682	689	696	704	711	718	725	732	739	7 | 5,6
613		746	753	760	767	774	781	789	796	803	810	8 | 6,4
614		817	824	831	838	845	852	859	866	873	880	9 | 7,2
615		888	895	902	909	916	923	930	937	944	951	
616		958	965	972	979	986	993	*000	*007	*014	*021	
617	79	029	036	043	050	057	064	071	078	085	092	
618		099	106	113	120	127	134	141	148	155	162	
619		169	176	183	190	197	204	211	218	225	232	
620		239	246	253	260	267	274	281	288	295	302	
621		309	316	323	330	337	344	351	358	365	372	7
622		379	386	393	400	407	414	421	428	435	442	1 | 0,7
623		449	456	463	470	477	484	491	498	505	511	2 | 1,4
624		518	525	532	539	546	553	560	567	574	581	3 | 2,1 4 | 2,8
625		588	595	602	609	616	623	630	637	644	650	5 | 3,5
626		657	664	671	678	685	692	699	706	713	720	6 | 4,2
627		727	734	741	748	754	761	768	775	782	789	7 | 4,9
628		796	803	810	817	824	831	837	844	851	858	8 | 5,6
629		865	872	879	886	893	900	906	913	920	927	9 | 6,3
630		934	941	948	955	962	969	975	982	989	996	
631	80	003	010	017	024	030	037	044	051	058	065	
632		072	079	085	092	099	106	113	120	127	134	
633		140	147	154	161	168	175	182	188	195	202	
634		209	216	223	229	236	243	250	257	264	271	
635		277	284	291	298	305	312	318	325	332	339	
636		346	353	359	366	373	380	387	393	400	407	
637		414	421	428	434	441	448	455	462	468	475	6
638		482	489	496	502	509	516	523	530	536	543	1 | 0,6
639		550	557	564	570	577	584	591	598	604	611	2 | 1,2
640		618	625	632	638	645	652	659	665	672	679	3 | 1,8 4 | 2,4 5 | 3,0
641		686	693	699	706	713	720	726	733	740	747	6 | 3,6
642		754	760	767	774	781	787	794	801	808	814	7 | 4,2
643		821	828	835	841	848	855	862	868	875	882	8 | 4,8
644		889	895	902	909	916	922	929	936	943	949	9 | 5,4
645		956	963	969	976	983	990	996	*003	*010	*017	
646	81	023	030	037	043	050	057	064	070	077	084	
647		090	097	104	111	117	124	131	137	144	151	
648		158	164	171	178	184	191	198	204	211	218	
649		224	231	238	245	251	258	265	271	278	285	
650		291	298	305	311	318	325	331	338	345	351	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L. 0	1	2	3	4	5	6	7	8	9	Prop. Pts.
650	81 291	298	305	311	318	325	331	338	345	351	
651	358	365	371	378	385	391	398	405	411	418	
652	425	431	438	445	451	458	465	471	478	485	
653	491	498	505	511	518	525	531	538	544	551	
654	558	564	571	578	584	591	598	604	611	617	
655	624	631	637	644	651	657	664	671	677	684	
656	690	697	704	710	717	723	730	737	743	750	
657	757	763	770	776	783	790	796	803	809	816	
658	823	829	836	842	849	856	862	869	875	882	
659	889	895	902	908	915	921	928	935	941	948	
660	954	961	968	974	981	987	994	·000	·007	·014	
661	82 020	027	033	040	046	053	060	066	073	079	**7**
662	086	092	099	105	112	119	125	132	138	145	1 | 0,7
663	151	158	164	171	178	184	191	197	204	210	2 | 1,4
664	217	223	230	236	243	249	256	263	269	276	3 | 2,1
665	282	289	295	302	308	315	321	328	334	341	4 | 2,8
666	347	354	360	367	373	380	387	393	400	406	5 | 3,5
667	413	419	426	432	439	445	452	458	465	471	6 | 4,2
668	478	484	491	497	504	510	517	523	530	536	7 | 4,9
669	543	549	556	562	569	575	582	588	595	601	8 | 5,6
670	607	614	620	627	633	640	646	653	659	666	9 | 6,3
671	672	679	685	692	698	705	711	718	724	730	
672	737	743	750	756	763	769	776	782	789	795	
673	802	808	814	821	827	834	840	847	853	860	
674	866	872	879	885	892	898	905	911	918	924	
675	930	937	943	950	956	963	969	975	982	988	
676	995	·001	·008	·014	·020	·027	·033	·040	·046	·052	
677	83 059	065	072	078	085	091	097	104	110	117	
678	123	129	136	142	149	155	161	168	174	181	
679	187	193	200	206	213	219	225	232	238	245	
680	251	257	264	270	276	283	289	296	302	308	
681	315	321	327	334	340	347	353	359	366	372	**6**
682	378	385	391	398	404	410	417	423	429	436	1 | 0,6
683	442	448	455	461	467	474	480	487	493	499	2 | 1,2
684	506	512	518	525	531	537	544	550	556	563	3 | 1,8
685	569	575	582	588	594	601	607	613	620	626	4 | 2,4
686	632	639	645	651	658	664	670	677	683	689	5 | 3,0
687	696	702	708	715	721	727	734	740	746	753	6 | 3,6
688	759	765	771	778	784	790	797	803	809	816	7 | 4,2
689	822	828	835	841	847	853	860	866	872	879	8 | 4,8
690	885	891	897	904	910	916	923	929	935	942	9 | 5,4
691	948	954	960	967	973	979	985	992	998	·004	
692	84 011	017	023	029	036	042	048	055	061	067	
693	073	080	086	092	098	105	111	117	123	130	
694	136	142	148	155	161	167	173	180	186	192	
695	198	205	211	217	223	230	236	242	248	255	
696	261	267	273	280	286	292	298	305	311	317	
697	323	330	336	342	348	354	361	367	373	379	
698	386	392	398	404	410	417	423	429	435	442	
699	448	454	460	466	473	479	485	491	497	504	
700	510	516	522	528	535	541	547	553	559	566	
N.	L. 0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
700	84	510	516	522	528	535	541	547	553	559	566	
701		572	578	584	590	597	603	609	615	621	628	
702		634	640	646	652	658	665	671	677	683	689	
703		696	702	708	714	720	726	733	739	745	751	
704		757	763	770	776	782	788	794	800	807	813	
705		819	825	831	837	844	850	856	862	868	874	
706		880	887	893	899	905	911	917	924	930	936	**7**
707		942	948	954	960	967	973	979	985	991	997	1 | 0,7
708	85	003	009	016	022	028	034	040	046	052	058	2 | 1,4
709		065	071	077	083	089	095	101	107	114	120	3 | 2,1
710		126	132	138	144	150	156	163	169	175	181	4 | 2,8 5 | 3,5 6 | 4,2
711		187	193	199	205	211	217	224	230	236	242	7 | 4,9
712		248	254	260	266	272	278	285	291	297	303	8 | 5,6
713		309	315	321	327	333	339	345	352	358	364	9 | 6,3
714		370	376	382	388	394	400	406	412	418	425	
715		431	437	443	449	455	461	467	473	479	485	
716		491	497	503	509	516	522	528	534	540	546	
717		552	558	564	570	576	582	588	594	600	606	
718		612	618	625	631	637	643	649	655	661	667	
719		673	679	685	691	697	703	709	715	721	727	
720		733	739	745	751	757	763	769	775	781	788	
721		794	800	806	812	818	824	830	836	842	848	
722		854	860	866	872	878	884	890	896	902	908	**6**
723		914	920	926	932	938	944	950	956	962	968	1 | 0,6 2 | 1,2
724		974	980	986	992	998	*004	*010	*016	*022	*028	3 | 1,8
725	86	034	040	046	052	058	064	070	076	082	088	4 | 2,4
726		094	100	106	112	118	124	130	136	141	147	5 | 3,0 6 | 3,6
727		153	159	165	171	177	183	189	195	201	207	7 | 4,2
728		213	219	225	231	237	243	249	255	261	267	8 | 4,8
729		273	279	285	291	297	303	308	314	320	326	9 | 5,4
730		332	338	344	350	356	362	368	374	380	386	
731		392	398	404	410	415	421	427	433	439	445	
732		451	457	463	469	475	481	487	493	499	504	
733		510	516	522	528	434	540	546	552	558	564	
734		570	576	581	587	593	599	605	611	617	623	
735		629	635	641	646	652	658	664	670	676	682	
736		688	694	700	705	711	717	723	729	735	741	**5**
737		747	753	759	764	770	776	782	788	794	800	1 | 0,5
738		806	812	817	823	829	835	841	847	853	859	2 | 1,0
739		864	870	876	882	888	894	900	906	911	917	3 | 1,5
740		923	929	935	941	947	953	958	964	970	976	4 | 2,0 5 | 2,5 6 | 3,0
741		982	988	994	999	*005	*011	*017	*023	*029	*035	7 | 3,5
742	87	040	046	052	058	064	070	075	081	087	093	8 | 4,0
743		099	105	111	116	122	128	134	140	146	151	9 | 4,5
744		157	163	169	175	181	186	192	198	204	210	
745		216	221	227	233	239	245	251	256	262	268	
746		274	280	286	291	297	303	309	315	320	326	
747		332	338	344	349	355	361	367	373	379	384	
748		390	396	402	408	413	419	425	431	437	442	
749		448	454	460	466	471	477	483	489	495	500	
750		506	512	518	523	529	535	541	547	552	558	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
750	87	506	512	518	523	529	535	541	547	552	558	
751		564	570	576	581	587	593	599	604	610	616	
752		622	628	633	639	645	651	656	662	668	674	
753		679	685	691	697	703	708	714	720	726	731	
754		737	743	749	754	760	766	772	777	783	789	
755		795	800	806	812	818	823	829	835	841	846	
756		852	858	864	869	875	881	887	892	898	904	
757		910	915	921	927	933	938	944	950	955	961	
758		967	973	978	984	990	996	·001	·007	·013	·018	
759	88	024	030	036	041	047	053	058	064	070	076	
760		081	087	093	098	104	110	116	121	127	133	
761		138	144	150	156	161	167	173	178	184	190	**6**
762		195	201	207	213	218	224	230	235	241	247	
763		252	258	264	270	275	281	287	292	298	304	1 | 0,6
764		309	315	321	326	332	338	343	349	355	360	2 | 1,2
765		366	372	377	383	389	395	400	406	412	417	3 | 1,8
766		423	429	434	440	446	451	457	463	468	474	4 | 2,4
767		480	485	491	497	502	508	513	519	525	530	5 | 3,0
768		536	542	547	553	559	564	570	576	581	587	6 | 3,6
769		593	598	604	610	615	621	627	632	638	643	7 | 4,2
770		649	655	660	666	672	677	683	689	694	700	8 | 4,8
771		705	711	717	722	728	734	739	745	750	756	9 | 5,4
772		762	767	773	779	784	790	795	801	807	812	
773		818	824	829	835	840	846	852	857	863	868	
774		874	880	885	891	897	902	908	913	919	925	
775		930	936	941	947	953	958	964	969	975	981	
776		986	992	997	·003	·009	·014	·020	·025	·031	·037	
777	89	042	048	053	059	064	070	076	081	087	092	
778		098	104	109	115	120	126	131	137	143	148	
779		154	159	165	170	176	182	187	193	198	204	
780		209	215	221	226	232	237	243	248	254	260	
781		265	271	276	282	287	293	298	304	310	315	**5**
782		321	326	332	337	343	348	354	360	365	371	
783		376	382	387	393	398	404	409	415	421	426	1 | 0,5
784		432	437	443	448	454	459	465	470	476	481	2 | 1,0
785		487	492	498	504	509	515	520	526	531	537	3 | 1,5
786		542	548	553	559	564	570	575	581	586	592	4 | 2,0
787		597	603	609	614	620	625	631	636	642	647	5 | 2,5
788		653	658	664	669	675	680	686	691	697	702	6 | 3,0
789		708	713	719	724	730	735	741	746	752	757	7 | 3,5
790		763	768	774	779	785	790	796	801	807	812	8 | 4,0
791		818	823	829	834	840	845	851	856	862	867	9 | 4,5
792		873	878	883	889	894	900	905	911	916	922	
793		927	933	938	944	949	955	960	966	971	977	
794		982	988	993	998	·004	·009	·015	·020	·026	·031	
795	90	037	042	048	053	059	064	069	075	080	086	
796		091	097	102	108	113	119	124	129	135	140	
797		146	151	157	162	168	173	179	184	189	195	
798		200	206	211	217	222	227	233	238	244	249	
799		255	260	266	271	276	282	287	293	298	304	
800		309	314	320	325	331	336	342	347	352	358	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
800	90	309	314	320	325	331	336	342	347	352	358	
801		363	369	374	380	385	390	396	401	407	412	
802		417	423	428	434	439	445	450	455	461	466	
803		472	477	482	488	493	499	504	509	515	520	
804		526	531	536	542	547	553	558	563	569	574	
805		580	585	590	596	601	607	612	617	623	628	
806		634	639	644	650	655	660	666	671	677	682	
807		687	693	698	703	709	714	720	725	730	736	
808		741	747	752	757	763	768	773	779	784	789	
809		795	800	806	811	816	822	827	832	838	843	
810		849	854	859	865	870	875	881	886	891	897	
811		902	907	813	918	924	929	934	940	945	950	**6**
812		956	961	966	972	977	982	988	993	998	*004	1 | 0,6
813	91	009	014	020	025	030	036	041	046	052	057	2 | 1,2
814		062	068	073	078	084	089	094	100	105	110	3 | 1,8
815		116	121	126	132	137	142	148	153	158	164	4 | 2,4
816		169	174	180	185	190	196	201	206	212	217	5 | 3,0
817		222	228	233	238	243	249	254	259	265	270	6 | 3,6
818		275	281	286	291	297	302	307	312	318	323	7 | 4,2
819		328	334	339	344	350	355	360	365	371	376	8 | 4,8
820		381	387	392	397	403	408	413	418	424	429	9 | 5,4
821		434	440	445	450	455	461	466	471	477	482	
822		487	492	498	503	508	514	519	524	529	535	
823		540	545	551	556	561	566	572	577	582	587	
824		593	598	603	609	614	619	624	630	635	640	
825		645	651	656	661	666	672	677	682	687	693	
826		698	703	709	714	719	724	730	735	740	745	
827		751	756	761	766	772	777	782	787	793	798	
828		803	808	814	819	824	829	834	840	845	850	
829		855	861	866	871	876	882	887	892	897	903	
830		908	913	918	924	929	934	939	944	950	955	
831		960	965	971	976	981	986	991	997	*002	*007	**5**
832	92	012	018	023	028	033	038	044	049	054	059	1 | 0,5
833		065	070	075	080	085	091	096	101	106	111	2 | 1,0
834		117	122	127	132	137	143	148	153	158	163	3 | 1,5
835		169	174	179	184	189	195	200	205	210	215	4 | 2,0
836		221	226	231	236	241	247	252	257	262	267	5 | 2,5
837		273	278	283	288	293	298	304	309	314	319	6 | 3,0
838		324	330	335	340	345	350	355	361	366	371	7 | 3,5
839		376	381	387	392	397	402	407	412	418	423	8 | 4,0
840		428	433	438	443	449	454	459	464	469	474	9 | 4,5
841		480	485	490	495	500	505	511	516	521	526	
842		531	536	542	547	552	557	562	567	572	578	
843		583	588	593	598	603	609	614	619	624	629	
844		634	639	645	650	655	660	665	670	675	681	
845		686	691	696	701	706	711	716	722	727	732	
846		737	742	747	752	758	763	768	773	778	783	
847		788	793	799	804	809	814	819	824	829	834	
848		840	845	850	855	860	865	870	875	881	886	
849		891	896	901	906	911	916	921	927	932	937	
850		942	947	952	957	962	967	973	978	983	988	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
850	92	942	947	952	957	962	967	973	978	983	988	
851		993	998	*003	*008	*013	*018	*024	*029	*034	*039	
852	93	044	049	054	059	064	069	075	080	085	090	
853		095	100	105	110	115	120	125	131	136	141	
854		146	151	156	161	166	171	176	181	186	192	
855		197	202	207	212	217	222	227	232	237	242	
856		247	252	258	263	268	273	278	283	288	293	**6**
857		298	303	308	313	318	323	328	334	339	344	1 | 0,6
858		349	354	359	364	369	374	379	384	389	394	2 | 1,2
859		399	404	409	414	420	425	430	435	440	445	3 | 1,8
860		450	455	460	465	470	475	480	485	490	495	4 | 2,4 5 | 3,0
861		500	505	510	515	520	526	531	536	541	546	6 | 3,6 7 | 4,2
862		551	556	561	566	571	576	581	586	591	596	8 | 4,8
863		601	606	611	616	621	626	631	636	641	646	9 | 5,4
864		651	656	661	666	671	676	682	687	692	697	
865		702	707	712	717	722	727	732	737	742	747	
866		752	757	762	767	772	777	782	787	792	797	
867		802	807	812	817	822	827	832	837	842	847	
868		852	857	862	867	872	877	882	887	892	897	
869		902	907	912	917	922	927	932	937	942	947	
870		952	957	962	967	972	977	982	987	992	997	
871	94	002	007	012	017	022	027	032	037	042	047	**5**
872		052	057	062	067	072	077	082	086	091	096	1 | 0,5
873		101	106	111	116	121	126	131	136	141	146	2 | 1,0
874		151	156	161	166	171	176	181	186	191	196	3 | 1,5 4 | 2,0
875		201	206	211	216	221	226	231	236	240	245	5 | 2,5
876		250	255	260	265	270	275	280	285	290	295	6 | 3,0 7 | 3,5
877		300	305	310	315	320	325	330	335	340	345	8 | 4,0
878		349	354	359	364	369	374	379	384	389	394	9 | 4,5
879		399	404	409	414	419	424	429	433	438	443	
880		448	453	458	463	468	473	478	483	488	493	
881		498	503	507	512	517	522	527	532	537	542	
882		547	552	557	562	567	571	576	581	586	591	
883		596	601	606	611	616	621	626	630	635	640	
884		645	650	655	660	665	670	675	680	685	689	
885		694	699	704	709	714	719	724	729	734	738	
886		743	748	753	758	763	768	773	778	783	787	**4**
887		792	797	802	807	812	817	822	827	832	836	1 | 0,4
888		841	846	851	856	861	866	871	876	880	885	2 | 0,8
889		890	895	900	905	910	915	919	924	929	934	3 | 1,2 4 | 1,6
890		939	944	949	954	959	963	968	973	978	983	5 | 2,0 6 | 2,4
891		988	993	998	*002	*007	*012	*017	*022	*027	*032	7 | 2,8
892	95	036	041	046	051	056	061	066	071	075	080	8 | 3,2
893		085	090	095	100	105	109	114	119	124	129	9 | 3,6
894		134	139	143	148	153	158	163	168	173	177	
895		182	187	192	197	202	207	211	216	221	226	
896		231	236	240	245	250	255	260	265	270	274	
897		279	284	289	294	299	303	308	313	318	323	
898		328	332	337	342	347	352	357	361	366	371	
899		376	381	386	390	395	400	405	410	415	419	
900		424	429	434	439	444	448	453	458	463	468	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
900	95	424	429	434	439	444	448	453	458	463	468	
901		472	477	482	487	492	497	501	506	511	516	
902		521	525	530	535	540	545	550	554	559	564	
903		569	574	578	583	588	593	598	602	607	612	
904		617	622	626	631	636	641	646	650	655	660	
905		665	670	674	679	684	689	694	698	703	708	
906		713	718	722	727	732	737	742	746	751	756	
907		761	766	770	775	780	785	789	794	799	804	
908		809	813	818	823	828	832	837	842	847	852	
909		856	861	866	871	875	880	885	890	895	899	
910		904	909	914	918	923	928	933	938	942	947	
911		952	957	961	966	971	976	980	985	990	995	**5**
912		999	*004	*009	*014	*019	*023	*028	*033	*038	*042	1 | 0,5
913	96	047	052	057	061	066	071	076	080	085	090	2 | 1,0
914		095	099	104	109	114	118	123	128	133	137	3 | 1,5
915		142	147	152	156	161	166	171	175	180	185	4 | 2,0
916		190	194	199	204	209	213	218	223	227	232	5 | 2,5
917		237	242	246	251	256	261	265	270	275	280	6 | 3,0
918		284	289	294	298	303	308	313	317	322	327	7 | 3,5
919		332	336	341	346	350	355	360	365	369	374	8 | 4,0
920		379	384	388	393	398	402	407	412	417	421	9 | 4,5
921		426	431	435	440	445	450	454	459	464	468	
922		473	478	483	487	492	497	501	506	511	515	
923		520	525	530	534	539	544	548	553	558	562	
924		567	572	577	581	586	591	595	600	605	609	
925		614	619	624	628	633	638	642	647	652	656	
926		661	666	670	675	680	685	689	694	699	703	
927		708	713	717	722	727	731	736	741	745	750	
928		755	759	764	769	774	778	783	788	792	797	
929		802	806	811	816	820	825	830	834	839	844	
930		848	853	858	862	867	872	876	881	886	890	
931		895	900	904	909	914	918	923	928	932	937	
932		942	946	951	956	960	965	970	974	979	984	
933		988	993	997	*002	*007	*011	*016	*021	*025	*030	**4**
934	97	035	039	044	049	053	058	063	067	072	077	1 | 0,4
935		081	086	090	095	100	104	109	114	118	123	2 | 0,8
936		128	132	137	142	146	151	155	160	165	169	3 | 1,2
937		174	179	183	188	192	197	202	206	211	216	4 | 1,6
938		220	225	230	234	239	243	248	253	257	262	5 | 2,0
939		267	271	276	280	285	290	294	299	304	308	6 | 2,4
940		313	317	322	327	331	336	340	345	350	354	7 | 2,8
941		359	364	368	373	377	382	387	391	396	400	8 | 3,2
942		405	410	414	419	424	428	433	437	442	447	9 | 3,6
943		451	456	460	465	470	474	479	483	488	493	
944		497	502	506	511	516	520	525	529	534	539	
945		543	548	552	557	562	566	571	575	580	585	
946		589	594	598	603	607	612	617	621	626	630	
947		635	640	644	649	653	658	663	667	672	676	
948		681	685	690	695	699	704	708	713	717	722	
949		727	731	736	740	745	749	754	759	763	768	
950		772	777	782	786	791	795	800	804	809	813	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE I.—*Common logarithms of numbers*—Continued

N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.
950	97	772	777	782	786	791	795	800	804	809	813	
951		818	823	827	832	836	841	845	850	855	859	
952		864	868	873	877	882	886	891	896	900	905	
953		909	914	918	923	928	932	937	941	946	950	
954		955	959	964	968	973	978	982	987	991	996	
955	98	000	005	009	014	019	023	028	032	037	041	
956		046	050	055	059	064	068	073	078	082	087	
957		091	096	100	105	109	114	118	123	127	132	
958		137	141	146	150	155	159	164	168	173	177	
959		182	186	191	195	200	204	209	214	218	223	
960		227	232	236	241	245	250	254	259	263	268	**5**
961		272	277	281	286	290	295	299	304	308	313	1 | 0,5
962		318	322	327	331	336	340	345	349	354	358	2 | 1,0
963		363	367	372	376	381	385	390	394	399	403	3 | 1,5
964		408	412	417	421	426	430	435	439	444	448	4 | 2,0
965		453	457	462	466	471	475	480	484	489	493	5 | 2,5
966		498	502	507	511	516	520	525	529	534	538	6 | 3,0
967		543	547	552	556	561	565	570	574	579	583	7 | 3,5
968		588	592	597	601	605	610	614	619	623	628	8 | 4,0
969		632	637	641	646	650	655	659	664	668	673	9 | 4,5
970		677	682	686	691	695	700	704	709	713	717	
971		722	726	731	735	740	744	749	753	758	762	
972		767	771	776	780	784	789	793	798	802	807	
973		811	816	820	825	829	834	838	843	847	851	
974		856	860	865	869	874	878	883	887	892	896	
975		900	905	909	914	918	923	927	932	936	941	
976		945	949	954	958	963	967	972	976	981	985	
977		989	994	998	·003	·007	·012	·016	·021	·025	·029	
978	99	034	038	043	047	052	056	061	065	069	074	
979		078	083	087	092	096	100	105	109	114	118	
980		123	127	131	136	140	145	149	154	158	162	**4**
981		167	171	176	180	185	189	193	198	202	207	1 | 0,4
982		211	216	220	224	229	233	238	242	247	251	2 | 0,8
983		255	260	264	269	273	277	282	286	291	295	3 | 1,2
984		300	304	308	313	317	322	326	330	335	339	4 | 1,6
985		344	348	352	357	361	366	370	374	379	383	5 | 2,0
986		388	392	396	401	405	410	414	419	423	427	6 | 2,4
987		432	436	441	445	449	454	458	463	467	471	7 | 2,8
988		476	480	484	489	493	498	502	506	511	515	8 | 3,2
989		520	524	528	533	537	542	546	550	555	559	9 | 3,6
990		564	568	572	577	581	585	590	594	599	603	
991		607	612	616	621	625	629	634	638	642	647	
992		651	656	660	664	669	673	677	682	686	691	
993		695	699	704	708	712	717	721	726	730	734	
994		739	743	747	752	756	760	765	769	774	778	
995		782	787	791	795	800	804	808	813	817	822	
996		826	830	835	839	843	848	852	856	861	865	
997		870	874	878	883	887	891	896	900	904	909	
998		913	917	922	926	930	935	939	944	948	952	
999		957	961	965	970	974	978	983	987	991	996	
1000	00	000	004	009	013	017	022	026	030	035	039	
N.	L.	0	1	2	3	4	5	6	7	8	9	Prop. Pts.

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TABLE II

COMMON LOGARITHMS OF CIRCULAR FUNCTIONS

(Sines, cosines, tangents, and cotangents for every minute of the quadrant)

0°

	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
0	—		—		—	0.00 000	60			
1	6.46 373	30103	6.46 373	30103	3.53 627	0.00 000	59		3476	3218	2997
2	6.76 476	17609	6.76 476	17609	3.23 524	0.00 000	58	1	348	322	300
3	6.94 085	12494	6.94 085	12494	3.05 915	0.00 000	57	2	695	644	599
4	7.06 579	9691	7.06 579	9691	2.93 421	0.00 000	56	3	1043	965	899
								4	1390	1287	1199
5	7.16 270	7918	7.16 270	7918	2.83 730	0.00 000	55	5	1738	1609	1498
6	7.24 188	6694	7.24 188	6694	2.75 812	0.00 000	54				
7	7.30 882	5800	7.30 882	5800	2.69 118	0.00 000	53				
8	7.36 682	5115	7.36 682	5115	2.63 318	0.00 000	52		2802	2633	2483
9	7.41 797	4576	7.41 797	4576	2.58 203	0.00 000	51	1	280	263	248
								2	560	527	497
10	7.46 373	4139	7.46 373	4139	2.53 627	0.00 000	50	3	841	790	745
11	7.50 512	3779	7.50 512	3779	2.49 488	0.00 000	49	4	1121	1053	993
12	7.54 291	3476	7.54 291	3476	2.45 709	0.00 000	48	5	1401	1316	1242
13	7.57 767	3218	7.57 767	3219	2.42 233	0.00 000	47				
14	7.60 985	2997	7.60 986	2996	2.39 014	0.00 000	46				
									2227	2021	1848
15	7.63 982	2802	7.63 982	2803	2.36 018	0.00 000	45	1	223	202	185
16	7.66 784	2633	7.66 785	2633	2.33 215	0.00 000	44	2	445	404	370
17	7.69 417	2483	7.69 418	2482	2.30 582	9.99 999	43	3	668	606	554
18	7.71 900	2348	7.71 900	2348	2.28 100	9.99 999	42	4	891	808	739
19	7.74 248	2227	7.74 248	2228	2.25 752	9.99 999	41	5	1113	1010	924
20	7.76 475	2119	7.76 476	2119	2.23 524	9.99 999	40				
21	7.78 594	2021	7.78 595	2020	2.21 405	9.99 999	39		1704	1579	1472
22	7.80 615	1930	7.80 615	1931	2.19 385	9.99 999	38	1	170	158	147
23	7.82 545	1848	7.82 546	1848	2.17 454	9.99 999	37	2	341	316	294
24	7.84 393	1773	7.84 394	1773	2.15 606	9.99 999	36	3	511	474	442
								4	682	632	589
25	7.86 166	1704	7.86 167	1704	2.13 833	9.99 999	35	5	852	789	736
26	7.87 870	1639	7.87 871	1639	2.12 129	9.99 999	34				
27	7.89 509	1579	7.89 510	1579	2.10 490	9.99 999	33				
28	7.91 088	1524	7.91 089	1524	2.08 911	9.99 999	32		1379	1297	1223
29	7.92 612	1472	7.92 613	1473	2.07 387	9.99 998	31	1	138	130	122
								2	276	259	245
30	7.94 084	1424	7.94 086	1424	2.05 914	9.99 998	30	3	414	389	367
31	7.95 508	1379	7.95 510	1379	2.04 490	9.99 998	29	4	552	519	489
32	7.96 887	1336	7.96 889	1336	2.03 111	9.99 998	28	5	690	649	612
33	7.98 223	1297	7.98 225	1297	2.01 775	9.99 998	27				
34	7.99 520	1259	7.99 522	1259	2.00 478	9.99 998	26				
									1158	1100	1046
35	8.00 779	1223	8.00 781	1223	1.99 219	9.99 998	25	1	116	110	105
36	8.02 002	1190	8.02 004	1190	1.97 996	9.99 998	24	2	232	220	209
37	8.03 192	1158	8.03 194	1159	1.96 806	9.99 997	23	3	347	330	314
38	8.04 350	1128	8.04 353	1128	1.95 647	9.99 997	22	4	463	440	418
39	8.05 478	1100	8.05 481	1100	1.94 519	9.99 997	21	5	579	550	523
40	8.06 578	1072	8.06 581	1072	1.93 419	9.99 997	20				
41	8.07 650	1046	8.07 653	1047	1.92 347	9.99 997	19		999	954	914
42	8.08 696	1022	8.08 700	1022	1.91 300	9.99 997	18	1	100	95	91
43	8.09 718	999	8.09 722	998	1.90 278	9.99 997	17	2	200	191	183
44	8.10 717	976	8.10 720	976	1.89 280	9.99 996	16	3	300	286	274
								4	400	382	366
45	8.11 693	954	8.11 696	955	1.88 304	9.99 996	15	5	500	477	457
46	8.12 647	934	8.12 651	934	1.87 349	9.99 996	14				
47	8.13 581	914	8.13 585	915	1.86 415	9.99 996	13				
48	8.14 495	896	8.14 500	895	1.85 500	9.99 996	12		877	843	812
49	8.15 391	877	8.15 395	878	1.84 605	9.99 996	11	1	88	84	81
								2	175	169	162
50	8.16 268	860	8.16 273	860	1.83 727	9.99 995	10	3	263	253	244
51	8.17 128	843	8.17 133	843	1.82 867	9.99 995	9	4	351	337	325
52	8.17 971	827	8.17 976	828	1.82 024	9.99 995	8	5	438	422	406
53	8.18 798	812	8.18 804	812	1.81 196	9.99 995	7				
54	8.19 610	797	8.19 616	797	1.80 384	9.99 995	6				
									782	755	730
55	8.20 407	782	8.20 413	782	1.79 587	9.99 994	5	1	78	75	73
56	8.21 189	769	8.21 195	769	1.78 805	9.99 994	4	2	156	151	146
57	8.21 958	755	8.21 964	756	1.78 036	9.99 994	3	3	235	226	219
58	8.22 713	743	8.22 720	742	1.77 280	9.99 994	2	4	313	302	292
59	8.23 456	730	8.23 462	730	1.76 538	9.99 994	1	5	391	377	365
60	8.24 186		8.24 192		1.75 808	9.99 993	0				
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.			

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TABLE II.—*Common logarithms of circular functions*—Continued

1°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
0	8. 24 186	717	8. 24 192	718	1. 75 808	9. 99 993	60		717	695	673
1	8. 24 903	706	8. 24 910	706	1. 75 090	9. 99 993	59	1	71. 7	69. 5	67. 3
2	8. 25 609	695	8. 25 616	696	1. 74 384	9. 99 993	58	2	143. 4	139. 0	134. 6
3	8. 26 304	684	8. 26 312	684	1. 73 688	9. 99 993	57	3	215. 1	208. 5	201. 9
4	8. 26 988	673	8. 26 996	673	1. 73 004	9. 99 992	56	4	286. 8	278. 0	269. 2
5	8. 27 661	663	8. 27 669	663	1. 72 331	9. 99 992	55	5	358. 5	347. 5	336. 5
6	8. 28 324	653	8. 28 332	654	1. 71 668	9. 99 992	54				
7	8. 28 977	644	8. 28 986	643	1. 71 014	9. 99 992	53		653	634	616
8	8. 29 621	634	8. 29 629	634	1. 70 371	9. 99 992	52	1	65. 3	63. 4	61. 6
9	8. 30 255	624	8. 30 263	625	1. 69 737	9. 99 991	51	2	130. 6	126. 8	123. 2
10	8. 30 879	616	8. 30 888	617	1. 69 112	9. 99 991	50	3	195. 9	190. 2	184. 8
11	8. 31 495	608	8. 31 505	607	1. 68 495	9. 99 991	49	4	261. 2	253. 6	246. 4
12	8. 32 103	599	8. 32 112	599	1. 67 888	9. 99 990	48	5	326. 5	317. 0	308. 0
13	8. 32 702	590	8. 32 711	591	1. 67 289	9. 99 990	47				
14	8. 33 292	583	8. 33 302	584	1. 66 698	9. 99 990	46		599	583	568
15	8. 33 875	575	8. 33 886	575	1. 66 114	9. 99 990	45	1	59. 9	58. 3	56. 8
16	8. 34 450	568	8. 34 461	568	1. 65 539	9. 99 989	44	2	119. 8	116. 6	113. 6
17	8. 35 018	560	8. 35 029	561	1. 64 971	9. 99 989	43	3	179. 7	174. 9	170. 4
18	8. 35 578	553	8. 35 590	553	1. 64 410	9. 99 989	42	4	239. 6	233. 2	227. 2
19	8. 36 131	547	8. 36 143	546	1. 63 857	9. 99 989	41	5	299. 5	291. 5	284. 0
20	8. 36 678	539	8. 36 689	540	1. 63 311	9. 99 988	40				
21	8. 37 217	533	8. 37 229	533	1. 62 771	9. 99 988	39		553	539	526
22	8. 37 750	526	8. 37 762	527	1. 62 238	9. 99 988	38	1	55. 3	53. 9	52. 6
23	8. 38 276	520	8. 38 289	520	1. 61 711	9. 99 987	37	2	110. 6	107. 8	105. 2
24	8. 38 796	514	8. 38 809	514	1. 61 191	9. 99 987	36	3	165. 9	161. 7	157. 8
25	8. 39 310	508	8. 39 323	509	1. 60. 677	9. 99 987	35	4	221. 2	215. 6	210. 4
26	8. 39 818	502	8. 39 832	502	1. 60 168	9. 99 986	34	5	276. 5	269. 5	263. 0
27	8. 40 320	496	8. 40 334	496	1. 59 666	9. 99 986	33				
28	8. 40 816	491	8. 40 830	491	1. 59 170	9. 99 986	32		514	502	490
29	8. 41 307	485	8. 41 321	486	1. 58 679	9. 99 985	31	1	51. 4	50. 2	49
30	8. 41 792	480	8. 41 807	480	1. 58 193	9. 99 985	30	2	102. 8	100. 4	98
31	8. 42 272	474	8. 42 287	475	1. 57 713	9. 99 985	29	3	154. 2	150. 6	147
32	8. 42 746	470	8. 42 762	470	1. 57 238	9. 99 984	28	4	205. 6	200. 8	196
33	8. 43 216	464	8. 43 232	464	1. 56 768	9. 99 984	27	5	257. 0	251. 0	245
34	8. 43 680	459	8. 43 696	460	1. 56 304	9. 99 984	26				
35	8. 44 139	455	8. 44 156	455	1. 55 844	9. 99 983	25		480	470	460
36	8. 44 594	450	8. 44 611	450	1. 55 389	9. 99 983	24	1	48	47	46
37	8. 45 044	445	8. 45 061	446	1. 54 939	9. 99 983	23	2	96	94	92
38	8. 45 489	441	8. 45 507	441	1. 54 493	9. 99 982	22	3	144	141	138
39	8. 45 930	436	8. 45 948	437	1. 54 052	9. 99 982	21	4	192	188	184
40	8. 46 366	433	8. 46 385	432	1. 53 615	9. 99 982	20	5	240	235	230
41	8. 46 799	427	8. 46 817	428	1. 53 183	9. 99 981	19				
42	8. 47 226	424	8. 47 245	424	1. 52 755	9. 99 981	18		450	440	430
43	8. 47 650	419	8. 47 669	420	1. 52 331	9. 99 981	17	1	45	44	43
44	8. 48 069	416	8. 48 089	416	1. 51 911	9. 99 980	16	2	90	88	86
45	8. 48 485	411	8. 48 505	412	1. 51 495	9. 99 980	15	3	135	132	129
46	8. 48 896	408	8. 48 917	408	1. 51 083	9. 99 979	14	4	180	176	172
47	8. 49 304	404	8. 49 325	404	1. 50 675	9. 99 979	13	5	225	220	215
48	8. 49 708	400	8. 49 729	401	1. 50 271	9. 99 979	12				
49	8. 50 108	396	8. 50 130	397	1. 49 870	9. 99 978	11		420	410	400
50	8. 50 504	393	8. 50 527	393	1. 49 473	9. 99 978	10	1	42	41	40
51	8. 50 897	390	8. 50 920	390	1. 49 080	9. 99 977	9	2	84	82	80
52	8. 51 287	386	8. 51 310	386	1. 48 690	9. 99 977	8	3	126	123	120
53	8. 51 673	382	8. 51 696	383	1. 48 304	9. 99 977	7	4	168	164	160
54	8. 52 055	379	8. 52 079	380	1. 47 921	9. 99 976	6	5	210	205	200
55	8. 52 434	376	8. 52 459	376	1. 47 541	9. 99 976	5				
56	8. 52 810	373	8. 52 835	373	1. 47 165	9. 99 975	4		390	380	370
57	8. 53 183	369	8. 53 208	370	1. 46 792	9. 99 975	3	1	39	38	37
58	8. 53 552	367	8. 53 578	367	1. 46 422	9. 99 974	2	2	78	76	74
59	8. 53 919	363	8. 53 945	363	1. 46 055	9. 99 974	1	3	117	114	111
60	8. 54 282		8. 54 308		1. 45 692	9. 99 974	0	4	156	152	148
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	5	195	190	185

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TABLE II.—*Common logarithms of circular functions*—Continued

2°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
								360	350	340
0	8. 54 282	360	8. 54 308	361	1. 45 692	9. 99 974	60			
1	8. 54 642	357	8. 54 669	358	1. 45 331	9. 99 973	59			
2	8. 54 999	355	9. 55 027	355	1. 44 973	9. 99 973	58	1	36	35	34
3	8. 55 354	351	8. 55 382	352	1. 44 618	9. 99 972	57	2	72	70	68
4	8. 55 705	349	8. 55 734	349	1. 44 266	9. 99 972	56	3	108	105	102
								4	144	140	136
5	8. 56 054	346	8. 56 083	346	1. 43 917	9. 99 971	55	5	180	175	170
6	8. 56 400	343	8. 56 429	344	1. 43 571	9. 99 971	54	6	216	210	204
7	8. 56 743	341	8. 56 773	341	1. 43 227	9. 99 970	53	7	252	245	238
8	8. 57 084	337	8. 57 114	338	1. 42 886	9. 99 970	52	8	288	280	272
9	8. 57 421	336	8. 57 452	336	1. 42 548	9. 99 969	51	9	324	315	306
									330	320	310
10	8. 57 757	332	8. 57 788	333	1. 42 212	9. 99 969	50				
11	8. 58 089	330	8. 58 121	330	1. 41 879	9. 99 968	49				
12	8. 58 419	328	8. 58 451	328	1. 41 549	9. 99 968	48	1	33	32	31
13	8. 58 747	325	8. 58 779	326	1. 41 221	9. 99 967	47	2	66	64	62
14	8. 59 072	323	8. 59 105	323	1. 40 895	9. 99 967	46	3	99	96	93
								4	132	128	124
15	8. 59 395	320	8. 59 428	321	1. 40 572	9. 99 967	45	5	165	160	155
16	8. 59 715	318	8. 59 749	319	1. 40 251	9. 99 966	44	6	198	192	186
17	8. 60 033	316	8. 60 068	316	1. 39 932	9. 99 966	43	7	231	224	217
18	8. 60 349	313	8. 60 384	314	1. 39 616	9. 99 965	42	8	264	256	248
19	8. 60 662	311	8. 60 698	311	1. 39 302	9. 99 964	41	9	297	288	279
									300	290	285
20	8. 60 973	309	8. 61 009	310	1. 38 991	9. 99 964	40				
21	8. 61 282	307	8. 61 319	307	1. 38 681	9. 99 963	39				
22	8. 61 589	305	8. 61 626	305	1. 38 374	9. 99 963	38	1	30	29	28. 5
23	8. 61 894	302	8. 61 931	303	1. 38 069	9. 99 962	37	2	60	58	57. 0
24	8. 62 196	301	8. 62 234	301	1. 37 766	9. 99 962	36	3	90	87	85. 5
								4	120	116	114. 0
25	8. 62 497	298	8. 62 535	299	1. 37 465	9. 99 961	35	5	150	145	142. 5
26	8. 62 795	296	8. 62 834	297	1. 37 166	9. 99 961	34	6	180	174	171. 0
27	8. 63 091	294	8. 63 131	295	1. 36 869	9. 99 960	33	7	210	203	199. 5
28	8. 63 385	293	8. 63 426	292	1. 36 574	9. 99 960	32	8	240	232	228. 0
29	8. 63 678	290	8. 63 718	291	1. 36 282	9. 99 959	31	9	270	261	256. 5
									280	275	270
30	8. 63 968	288	8. 64 009	289	1. 35 991	9. 99 959	30				
31	8. 64 256	287	8. 64 298	287	1. 35 702	9. 99 958	29				
32	8. 64 543	284	8. 64 585	285	1. 35 415	9. 99 958	28	1	28. 0	27. 5	27. 0
33	8. 64 827	283	8. 64 870	284	1. 35 130	9. 99 957	27	2	56. 0	55. 0	54. 0
34	8. 65 110	281	8. 65 154	281	1. 34 846	9. 99 956	26	3	84. 0	82. 5	81. 0
								4	112. 0	110. 0	108. 0
35	8. 65 391	279	8. 65 435	280	1. 34 565	9. 99 956	25	5	140. 0	137. 5	135. 0
36	8. 65 670	277	8. 65 715	278	1. 34 285	9. 99 955	24	6	168. 0	165. 0	162. 0
37	8. 65 947	276	8. 65 993	276	1. 34 007	9. 99 955	23	7	196. 0	192. 5	189. 0
38	8. 66 223	274	8. 66 269	274	1. 33 731	9. 99 954	22	8	224. 0	220. 0	216. 0
39	8. 66 497	272	8. 66 543	273	1. 33 457	9. 99 954	21	9	252. 0	247. 5	243. 0
									265	260	255
40	8. 66 769	270	8. 66 816	271	1. 33 184	9. 99 953	20				
41	8. 67 039	269	8. 67 087	269	1. 32 913	9. 99 952	19				
42	8. 67 308	267	8. 67 356	268	1. 32 644	9. 99 952	18	1	26. 5	26. 0	25. 5
43	8. 67 575	266	8. 67 624	266	1. 32 376	9. 99 951	17	2	53. 0	52. 0	51. 0
44	8. 67 841	263	8. 67 890	264	1. 32 110	9. 99 951	16	3	79. 5	78. 0	76. 5
								4	106. 0	104. 0	102. 0
45	8. 68 104	263	8. 68 154	263	1. 31 846	9. 99 950	15	5	132. 5	130. 0	127. 5
46	8. 68 367	260	8. 68 417	261	1. 31 583	9. 99 949	14	6	159. 0	156. 0	153. 0
47	8. 68 627	259	8. 68 678	260	1. 31 322	9. 99 949	13	7	185. 5	182. 0	178. 5
48	8. 68 886	258	8. 68 938	258	1. 31 062	9. 99 948	12	8	212. 0	208. 0	204. 0
49	8. 69 144	256	8. 69 196	257	1. 30 804	9. 99 948	11	9	238. 5	234. 0	229. 5
									250	245	240
50	8. 69 400	254	8. 69 453	255	1. 30 547	9. 99 947	10				
51	8. 69 654	253	8. 69 708	254	1. 30 292	9. 99 946	9				
52	8. 69 907	252	8. 69 962	252	1. 30 038	9. 99 946	8	1	25. 0	24. 5	24. 0
53	8. 70 159	250	8. 70 214	251	1. 29 786	9. 99 945	7	2	50. 0	49. 0	48. 0
54	8. 70 409	249	8. 70 465	249	1. 29 535	9. 99 944	6	3	75. 0	73. 5	72. 0
								4	100. 0	198. 0	96. 0
55	8. 70 658	247	8. 70 714	248	1. 29 286	9. 99 944	5	5	125. 0	122. 5	120. 0
56	8. 70 905	246	8. 70 962	246	1. 29 038	9. 99 943	4	6	150. 0	147. 0	144. 0
57	8. 71 151	244	8. 71 208	245	1. 28 792	9. 99 942	3	7	175. 0	171. 5	168. 0
58	8. 71 395	243	8 71. 453	244	1. 28 547	9. 99 942	2	8	200. 0	196. 0	192. 0
59	8. 71 638	242	8. 71 967	243	1. 28 303	9. 99 941	1	9	225. 0	220. 5	216. 0
60	8. 71 880		8. 71 940		1. 28 060	9. 99 940	0				
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.		

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TABLE II.—*Common logarithms of circular functions*—Continued

3°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.			
0	8.71 880	240	8.71 940	241	1.28 060	9.99 940	60		238	234	229
1	8.72 120	239	8.72 181	239	1.27 819	9.99 940	59				
2	8.72 359	238	8.72 420	239	1.27 580	9.99 939	58	1	23.8	23.4	22.9
3	8.72 597	237	8.72 659	237	1.27 341	9.99 938	57	2	47.6	46.8	45.8
4	8.72 834	235	8.72 896	236	1.27 104	9.99 938	56	3	71.4	70.2	68.7
5	8.73 069	234	8.73 132	234	1.26 868	9.99 937	55	4	95.2	93.6	91.6
6	8.73 303	232	8.73 366	234	1.26 634	9.99 936	54	5	119.0	117.0	114.5
7	8.73 535	232	8.73 600	232	1.26 400	9.99 936	53	6	142.8	140.4	137.4
8	8.73 767	230	8.73 832	231	1.26 168	9.99 935	52	7	166.6	163.8	160.3
9	8.73 997	229	8.74 063	229	1.25 937	9.99 934	51	8	190.4	187.2	183.2
10	8.74 226	228	8.74 292	229	1.25 708	9.99 934	50	9	214.2	210.6	206.1
11	8.74 454	226	8.74 521	227	1.25 479	9.99 933	49		225	220	216
12	8.74 680	226	8.74 748	226	1.25 252	9.99 932	48	1	22.5	22.0	21.6
13	8.74 906	224	8.74 974	225	1.25 026	9.99 932	47	2	45.0	44.0	43.2
14	8.75 130	223	8.75 199	224	1.24 801	9.99 931	46	3	67.5	66.0	64.8
15	8.75 353	222	8.75 423	222	1.24 577	9.99 930	45	4	90.0	88.0	86.4
16	8.75 575	220	8.75 645	222	1.24 355	9.99 929	44	5	112.5	110.0	108.0
17	8.75 795	220	8.75 867	220	1.24 133	9.99 929	43	6	135.0	132.0	129.6
18	8.76 015	219	8.76 087	219	1.23 913	9.99 928	42	7	157.5	154.0	151.2
19	8.76 234	217	8.76 306	219	1.23 694	9.99 927	41	8	180.0	176.0	172.8
20	8.76 451	216	8.76 525	217	1.23 475	9.99 926	40	9	202.5	198.0	194.4
21	8.76 667	216	8.76 742	216	1.23 258	9.99 926	39		212	208	204
22	8.76 883	214	8.76 958	215	1.23 042	9.99 925	38	1	21.2	20.8	20.4
23	8.77 097	213	8.77 173	214	1.22 827	9.99 924	37	2	42.4	41.6	40.8
24	8.77 310	212	8.77 387	213	1.22 613	9.99 923	36	3	63.6	62.4	61.2
25	8.77 522	211	8.77 600	211	1.22 400	9.99 923	35	4	84.8	83.2	81.6
26	8.77 733	210	8.77 811	211	1.22 189	9.99 922	34	5	106.0	104.0	102.0
27	8.77 943	209	8.78 022	210	1.21 978	9.99 921	33	6	127.2	124.8	122.4
28	8.78 152	208	8.78 232	209	1.21 768	9.99 920	32	7	148.4	145.6	142.8
29	8.78 360	208	8.78 441	208	1.21 559	9.99 920	31	8	169.6	166.4	163.2
30	8.78 568	206	8.78 649	206	1.21 351	9.99 919	30	9	190.8	187.2	183.6
31	8.78 774	205	8.78 855	206	1.21 145	9.99 918	29		201	197	193
32	8.78 979	204	8.79 061	205	1.20 939	9.99 917	28	1	20.1	19.7	19.3
33	8.79 183	203	8.79 266	204	1.20 734	9.99 917	27	2	40.2	39.4	38.6
34	8.79 386	202	8.79 470	203	1.20 530	9.99 916	26	3	60.3	59.1	57.9
35	8.79 588	201	8.79 673	202	1.20 327	9.99 915	25	4	80.4	78.8	77.2
36	8.79 789	201	8.79 875	201	1.20 125	9.99 914	24	5	100.5	98.5	96.5
37	8.79 990	199	8.80 076	201	1.19 924	9.99 913	23	6	120.6	118.2	115.8
38	8.80 189	199	8.80 277	199	1.19 723	9.99 913	22	7	140.7	137.9	135.1
39	8.80 388	197	8.80 476	198	1.19 524	9.99 912	21	8	160.8	157.6	154.4
40	8.80 585	197	8.80 674	198	1.19 326	9.99 911	20	9	180.9	177.3	173.7
41	8.80 782	196	8.80 872	196	1.19 128	9.99 910	19		189	185	181
42	8.80 978	195	8.81 068	196	1.18 932	9.99 909	18	1	18.9	18.5	18.1
43	8.81 173	194	8.81 264	195	1.18 736	9.99 909	17	2	37.8	37.0	36.2
44	8.81 367	193	8.81 459	194	1.18 541	9.99 908	16	3	56.7	55.5	54.3
45	8.81 560	192	8.81 653	193	1.18 347	9.99 907	15	4	75.6	74.0	72.4
46	8.81 752	192	8.81 846	192	1.18 154	9.99 906	14	5	94.5	92.5	90.5
47	8.81 944	190	8.82 038	192	1.17 962	9.99 905	13	6	113.4	111.0	108.6
48	8.82 134	190	8.82 230	190	1.17 770	9.99 904	12	7	132.3	129.5	126.7
49	8.82 324	189	8.82 420	190	1.17 580	9.99 904	11	8	151.2	148.0	144.8
50	8.82 513	188	8.82 610	189	1.17 390	9.99 903	10	9	170.1	166.5	162.9
51	8.82 701	187	8.82 799	188	1.17 201	9.99 902	9		4	3	2	1
52	8.82 888	187	8.82 987	188	1.17 013	9.99 901	8	1	0.4	0.3	0.2	0.1
53	8.83 075	186	8.83 175	186	1.16 825	9.99 900	7	2	0.8	0.6	0.4	0.2
54	8.83 261	185	8.83 361	186	1.16 639	9.99 899	6	3	1.2	0.9	0.6	0.3
55	8.83 446	184	8.83 547	185	1.16 453	9.99 898	5	4	1.6	1.2	0.8	0.4
56	8.83 630	183	8.83 732	184	1.16 268	9.99 898	4	5	2.0	1.5	1.0	0.5
57	8.83 813	183	8.83 916	184	1.16 084	9.99 897	3	6	2.4	1.8	1.2	0.6
58	8.83 996	181	8.84 100	182	1.15 900	9.99 896	2	7	2.8	2.1	1.4	0.7
59	8.84 177	181	8.84 282	182	1.15 718	9.99 895	1	8	3.2	2.4	1.6	0.8
60	8.84 358		8.84 464		1.15 536	9.99 894	0	9	3.6	2.7	1.8	0.9
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.			

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TABLE II.—*Common logarithms of circular functions*—Continued

4°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
0	8.84 358	181	8.84 464	182	1.15 536	9.99 894	60		181	179	177
1	8.84 539	179	8.84 646	180	1.15 354	9.99 893	59				
2	8.84 718	179	8.84 826	180	1.15 174	9.99 892	58	1	18.1	17.9	17.7
3	8.84 897	178	8.85 006	179	1.14 994	9.99 891	57	2	36.2	35.8	35.4
4	8.85 075	177	8.85 185	178	1.14 815	9.99 891	56	3	54.3	53.7	53.1
5	8.85 252	177	8.85 363	177	1.14 637	9.99 890	55	4	72.4	71.6	70.8
6	8.85 429	176	8.85 540	177	1.14 460	9.99 889	54	5	90.5	89.5	88.5
7	8.85 605	175	8.85 717	176	1.14 283	9.99 888	53	6	108.6	107.4	106.2
8	8.85 780	175	8.85 893	176	1.14 107	9.99 887	52	7	126.7	125.3	123.9
9	8.85 955	173	8.86 069	174	1.13 931	9.99 886	51	8	144.8	143.2	141.6
								9	162.9	161.1	159.3
10	8.86 128	173	8.86 243	174	1.13 757	9.99 885	50		175	173	171
11	8.86 301	173	8.86 417	174	1.13 583	9.99 884	49				
12	8.86 474	171	8.86 591	172	1.13 409	9.99 883	48	1	17.5	17.3	17.1
13	8.86 645	171	8.86 763	172	1.13 237	9.99 882	47	2	35.0	34.6	34.2
14	8.86 816	171	8.86 935	171	1.13 065	9.99 881	46	3	52.5	51.9	51.3
15	8.86 987	169	8.87 106	171	1.12 894	9.99 880	45	4	70.0	69.2	68.4
16	8.87 156	169	8.87 277	170	1.12 723	9.99 879	44	5	87.5	86.5	85.5
17	8.87 325	169	8.87 447	169	1.12 553	9.99 879	43	6	105.0	103.8	102.6
18	8.87 494	167	8.87 616	169	1.12 384	9.99 878	42	7	122.5	121.1	119.7
19	8.87 661	168	8.87 785	168	1.12 215	9.99 877	41	8	140.0	138.4	136.8
								9	157.5	155.7	153.9
20	8.87 829	166	8.87 953	167	1.12 047	9.99 876	40		168	166	164
21	8.87 995	166	8.88 120	167	1.11 880	9.99 875	39				
22	8.88 161	165	8.88 287	166	1.11 713	9.99 874	38	1	16.8	16.6	16.4
23	8.88 326	164	8.88 453	165	1.11 547	9.99 873	37	2	33.6	33.2	32.8
24	8.88 490	164	8.88 618	165	1.11 382	9.99 872	36	3	50.4	49.8	49.2
25	8.88 654	163	8.88 783	165	1.11 217	9.99 871	35	4	67.2	66.4	65.6
26	8.88 817	163	8.88 948	163	1.11 052	9.99 870	34	5	84.0	83.0	82.0
27	8.88 980	162	8.89 111	163	1.10 889	9.99 869	33	6	100.8	99.6	98.4
28	8.89 142	162	8.89 274	163	1.10 726	9.99 868	32	7	117.6	116.2	114.8
29	8.89 304	160	8.89 437	161	1.10 563	9.99 867	31	8	34.4	132.8	131.2
								9	151.2	149.4	147.6
30	8.89 464	161	8.89 598	162	1.10 402	9.99 866	30		162	159	157
31	8.89 625	159	8.89 760	160	1.10 240	9.99 865	29				
32	8.89 784	159	8.89 920	160	1.10 080	9.99 864	28	1	16.2	15.9	15.7
33	8.89 943	159	8.90 080	160	1.09 920	9.99 863	27	2	32.4	31.8	31.4
34	8.90 102	158	8.90 240	159	1.09 760	9.99 862	26	3	48.6	47.7	47.1
35	8.90 260	157	8.90 399	158	1.09 601	9.99 861	25	4	64.8	63.6	62.8
36	8.90 417	157	8.90 557	158	1.09 443	9.99 860	24	5	81.0	79.5	78.5
37	8.90 574	156	8.90 715	157	1.09 285	9.99 859	23	6	97.2	95.4	94.2
38	8.90 730	155	8.90 872	157	1.09 128	9.99 858	22	7	113.4	111.3	109.9
39	8.90 885	155	8.91 029	156	1.08 971	9.99 857	21	8	129.6	127.2	125.6
								9	145.8	143.1	141.3
40	8.91 040	155	8.91 185	155	1.08 815	9.99 856	20		155	153	151
41	8.91 195	154	8.91 340	155	1.08 660	9.99 855	19				
42	8.91 349	153	8.91 495	155	1.08 505	9.99 854	18	1	15.5	15.3	15.1
43	8.91 502	153	8.91 650	153	1.08 350	9.99 853	17	2	31.0	30.6	30.2
44	8.91 655	152	8.91 803	154	1.08 197	9.99 852	16	3	46.5	45.9	45.3
45	8.91 807	152	8.91 957	153	1.08 043	9.99 851	15	4	62.0	61.2	60.4
46	8.91 959	151	8.92 110	152	1.07 890	9.99 850	14	5	77.5	76.5	75.5
47	8.92 110	151	8.92 262	152	1.07 738	9.99 848	13	6	93.0	91.8	90.6
48	8.92 261	150	8.92 414	151	1.07 586	9.99 847	12	7	108.5	107.1	105.7
49	8.92 411	150	8.92 565	151	1.07 435	9.99 846	11	8	124.0	122.4	120.8
								9	139.5	137.7	135.9
50	8.92 561	149	8.92 716	150	1.07 284	9.99 845	10		149	147	1
51	8.92 710	149	8.92 866	150	1.07.134	9.99 844	9				
52	8.92 859	148	8.93 016	149	1.06 984	9.99 843	8	1	14.9	14.7	0.1
53	8.93 077	147	8.93 165	148	1.06.835	9.99 842	7	2	29.8	29.4	0.2
54	8.93 154	147	8.93 313	149	1.06 687	9.99 841	6	3	44.7	44.1	0.3
55	8.93 301	147	8.93 462	147	1.06 538	9.99 840	5	4	59.6	58.8	0.4
56	8.93 448	146	8.93 609	147	1.06 391	9.99 839	4	5	74.5	73.5	0.5
57	8.93 594	146	8.93 756	147	1.06 244	9.99 838	3	6	89.4	88.2	0.6
58	8.93 740	145	8.93 903	146	1.06 097	9.99 837	2	7	104.3	102.9	0.7
59	8.93 885	145	8.94 049	146	1.05 951	9.99 836	1	8	119.2	117.6	0.8
								9	134.1	132.3	0.9
60	8.94 030		8.94 195		1.05 805	9.99 834	0				
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.		

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TABLE II.—*Common logarithms of circular functions*—Continued

5°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
								145	143	141
0	8.94 030	144	8.94 195	145	1.05 805	9.99 834	60			
1	8.94 174	143	8.94 340	145	1.05 660	9.99 833	59			
2	8.94 317	144	8.94 485	145	1.05 515	9.99 832	58	1 14.5	14.3	14.1
3	8.94 461	142	8.94 630	146	1.05 370	9.99 831	57	2 29.0	28.6	28.2
4	8.94 603	143	8.94 773	143	1.05 227	9.99 830	56	3 43.5	42.9	42.3
				144				4 58.0	57.2	56.4
5	8.94 746	141	8.94 917	143	1.05 083	9.99 829	55	5 72.5	71.5	70.5
6	8.94 887	142	8.95 060	142	1.04 940	9.99 828	54	6 87.0	85.8	84.6
7	8.95 029	141	8.95 202	142	1.04 798	9.99 827	53	7 101.5	100.1	98.7
8	8.95 170	140	8.95 344	142	1.04 656	9.99 825	52	8 116.0	114.4	112.8
9	8.95 310	140	8.95 486	141	1.04 514	9.99 824	51	9 130.5	128.7	126.9
								139	138	136
10	8.95 450	139	8.95 627	140	1.04 373	9.99 823	50			
11	8.95 589	139	8.95 767	141	1.04 233	9.99 822	49			
12	8.95 728	139	8.95 908	139	1.04 092	9.99 821	48	1 13.9	13.8	13.6
13	8.95 867	138	8.96 047	140	1.03 953	9.99 820	47	2 27.8	27.6	27.2
14	8.96 005	138	8.96 187	138	1.03 813	9.99 819	46	3 41.7	41.4	40.8
								4 55.6	55.2	54.4
15	8.96 143	137	8.96 325	139	1.03 675	9.99 817	45	5 69.5	69.0	68.0
16	8.96 280	137	8.96 464	138	1.03 536	9.99 816	44	6 83.4	82.8	81.6
17	8.96 417	136	8.96 602	137	1.03 398	9.99 815	43	7 97.3	96.6	95.2
18	8.96 553	136	8.96 739	138	1.03 261	9.99 814	42	8 111.2	110.4	108.8
19	8.96 689	136	8.96 877	136	1.03 123	9.99 813	41	9 125.1	124.2	122.4
								135	133	131
20	8.96 825	135	8.97 013	137	1.02 987	9.99 812	40			
21	8.96 960	135	8.97 150	135	1.02 850	9.99 810	39			
22	8.97 095	134	8.97 285	136	1.02 715	9.99 809	38	1 13.5	13.3	13.1
23	8.97 229	134	8.97 421	135	1.02 579	9.99 808	37	2 27.0	26.6	26.2
24	8.97 363	133	8.97 556	135	1.02 444	9.99 807	36	3 40.5	39.9	39.3
								4 54.0	53.2	52.4
25	8.97 496	133	8.97 691	134	1.02 309	9.99 806	35	5 67.5	66.5	65.5
26	8.97 629	133	8.97 825	134	1.02 175	9.99 804	34	6 81.0	79.8	78.6
27	8.97 762	132	8.97 959	134	1.02 041	9.99 803	33	7 94.5	93.1	91.7
28	8.97 894	132	8.98 092	133	1.01 908	9.99 802	32	8 108.0	106.4	104.8
29	8.98 026	131	8.98 225	133	1.01 775	9.99 801	31	9 121.5	119.7	117.9
								129	128	126
30	8.98 157	131	8.98 358	132	1.01 642	9.99 800	30			
31	8.98 288	131	8.98 490	132	1.01 510	9.99 798	29			
32	8.98 419	130	8.98 622	131	1.01 378	9.99 797	28	1 12.9	12.8	12.6
33	8.98 549	130	8.98 753	131	1.01 247	9.99 796	27	2 25.8	25.6	25.2
34	8.98 679	129	8.98 884	131	1.01 116	9.99 795	26	3 38.7	38.4	37.8
								4 51.6	51.2	50.4
35	8.98 808	129	8.99 015	130	1.00 985	9.99 793	25	5 64.5	64.0	63.0
36	8.98 937	129	8.99 145	130	1.00 855	9.99 792	24	6 77.4	76.8	75.6
37	8.99 066	128	8.99 275	130	1.00 725	9.99 791	23	7 90.3	89.6	88.2
38	8.99 194	128	8.99 405	129	1.00 595	9.99 790	22	8 103.2	102.4	100.8
39	8.99 322	128	8.99 534	128	1.00 466	9.99 788	21	9 116.1	115.2	113.4
								125	123	122
40	8.99 450	127	8.99 662	129	1.00 338	9.99 787	20			
41	8.99 577	127	8.99 791	128	1.00 209	9.99 786	19			
42	8.99 704	126	8.99 919	127	1.00 081	9.99 785	18	1 12.5	12.3	12.2
43	8.99 830	126	9.00 046	128	0.99 954	9.99 783	17	2 25.0	24.6	24.4
44	8.99 956	126	9.00 174	127	0.99 826	9.99 782	16	3 37.5	36.9	36.6
								4 50.0	49.2	48.8
45	9.00 082	125	9.00 301	126	0.99 699	9.99 781	15	5 62.5	61.5	61.0
46	9.00 207	125	9.00 427	126	0.99 573	9.99 780	14	6 75.0	73.8	73.2
47	9.00 332	124	9.00 553	126	0.99 447	9.99 778	13	7 87.5	86.1	85.4
48	9.00 456	125	9.00 679	126	0.99 321	9.99 777	12	8 100.0	98.4	97.6
49	9.00 581	123	9.00 805	125	0.99 195	9.99 776	11	9 112.5	110.7	109.8
								121	120	1
50	9.00 704	124	9.00 930	125	0.99 070	9.99 775	10			
51	9.00 828	123	9.01 055	124	0.98 945	9.99 773	9			
52	9.00 951	123	9.01 179	124	0.98 821	9.99 772	8	1 12.1	12.0	0.1
53	9.01 074	122	9.01 303	124	0.98 697	9.99 771	7	2 24.2	24.0	0.2
54	9.01 196	122	9.01 427	123	0.98 573	9.99 769	6	3 36.3	36.0	0.3
								4 48.4	48.0	0.4
55	9.01 318	122	9.01 550	123	0.98 450	9.99 768	5	5 60.5	60.0	0.5
56	9.01 440	121	9.01 673	123	0.98 327	9.99 767	4	6 72.6	72.0	0.6
57	9.01 561	121	9.01 796	122	0.98 204	9.99 765	3	7 84.7	84.0	0.7
58	9.01 682	121	9.01 918	122	0.98 082	9.99 764	2	8 96.8	96.0	0.8
59	9.01 803	120	9.02 040	122	0.97 960	9.99 763	1	9 108.9	108.0	0.9
60	9.01 923		9.02 162		0.97 838	9.99 761	0			
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.		

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TABLE II.—*Common logarithms of circular functions*—Continued

6°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
									121	120	119
0	9.01 923	120	9.02 162	121	0.97 838	9.99 761	60				
1	9.02 043	120	9.02 283	121	0.97 717	9.99 760	59				
2	9.02 163	120	9.02 404	121	0.97 596	9.99 759	58	1	12.1	12.0	11.9
3	9.02 283	119	9.02 525	120	0.97 475	9.99 757	57	2	24.2	24.0	23.8
4	9.02 402	118	9.02 645	121	0.97 355	9.99 756	56	3	36.3	36.0	35.7
								4	48.4	48.0	47.6
5	9.02 520	119	9.02 766	119	0.97 234	9.99 755	55	5	60.5	60.0	59.5
6	9.02 639	118	9.02 885	120	0.97 115	9.99 753	54	6	72.6	72.0	71.4
7	9.02 757	117	9.03 005	119	0.96 995	9.99 752	53	7	84.7	84.0	83.3
8	9.02 874	118	9.03 124	118	0.96 876	9.99 751	52	8	96.8	96.0	95.2
9	9.02 992	117	9.03 242	119	0.96 758	9.99 749	51	9	108.9	108.0	107.1
									118	117	116
10	9.03 109	117	9.03 361	118	0.96 639	9.99 748	50				
11	9.03 226	116	9.03 479	118	0.96 521	9.99 747	49				
12	9.03 342	116	9.03 597	117	0.96 403	9.99 745	48	1	11.8	11.7	11.6
13	9.03 458	116	9.03 714	118	0.96 286	9.99 744	47	2	23.6	23.4	23.2
14	9.03 574	116	9.03 832	116	0.96 168	9.99 742	46	3	35.4	35.1	34.8
								4	47.2	46.8	46.4
15	9.03 690	115	9.03 948	117	0.96 052	9.99 741	45	5	59.0	58.5	58.0
16	9.03 805	115	9.04 065	116	0.95 935	9.99 740	44	6	70.8	70.2	69.6
17	9.03 920	114	9.04 181	116	0.95 819	9.99 738	43	7	82.6	81.9	81.2
18	9.04 034	115	9.04 297	116	0.95 703	9.99 737	42	8	94.4	93.6	92.8
19	9.04 149	113	9.04 413	115	0.95 587	9.99 736	41	9	106.2	105.3	104.4
									115	114	113
20	9.04 262	114	9.04 528	115	0.95 472	9.99 734	40				
21	9.04 376	114	9.04 643	115	0.95 357	9.99 733	39				
22	9.04 490	113	9.04 758	115	0.95 242	9.99 731	38	1	11.5	11.4	11.3
23	9.04 603	112	9.04 873	114	0.95 127	9.99 730	37	2	23.0	22.8	22.6
24	9.04 715	113	9.04 987	114	0.95 013	9.99 728	36	3	34.5	34.2	33.9
								4	46.0	45.6	45.2
25	9.04 828	112	9.05 101	113	0.94 899	9.99 727	35	5	57.5	57.0	56.5
26	9.04 940	112	9.05 214	114	0.94 786	9.99 726	34	6	69.0	68.4	67.8
27	9.05 052	112	9.05 328	113	0.94 672	9.99 724	33	7	80.5	79.8	79.1
28	9.05 164	111	9.05 441	112	0.94 559	9.99 723	32	8	92.0	91.2	90.4
29	9.05 275	111	9.05 553	113	0.94 447	9.99 721	31	9	103.5	102.6	101.7
									112	111	110
30	9.05 386	111	9.05 666	112	0.94 334	9.99 720	30				
31	9.05 497	110	9.05 778	112	0.94 222	9.99 718	29				
32	9.05 607	110	9.05 890	112	0.94 110	9.99 717	28	1	11.2	11.1	11.0
33	9.05 717	110	9.06 002	111	0.93 998	9.99 716	27	2	22.4	22.2	22.0
34	9.05 827	110	9.06 113	111	0.93 887	9.99 714	26	3	33.6	33.3	33.0
								4	44.8	44.4	44.0
35	9.05 937	109	9.06 224	111	0.93 776	9.99 713	25	5	56.0	55.5	55.0
36	9.06 046	109	9.06 335	110	0.93 665	9.99 711	24	6	67.2	66.6	66.0
37	9.06 155	109	9.06 445	111	0.93 555	9.99 710	23	7	78.4	77.7	77.0
38	9.06 264	108	9.06 556	110	0.93 444	9.99 708	22	8	89.6	88.8	88.0
39	9.06 372	109	9.06 666	109	0.93 334	9.99 707	21	9	100.8	99.9	99.0
									109	108	107
40	9.06 481	108	9.06 775	110	0.93 225	9.99 705	20				
41	9.06 589	107	9.06 885	109	0.93 115	9.99 704	19				
42	9.06 696	108	9.06 994	109	0.93 006	9.99 702	18	1	10.9	10.8	10.7
43	9.06 804	107	9.07 103	108	0.92 897	9.99 701	17	2	21.8	21.6	21.4
44	9.06 911	107	9.07 211	109	0.92 789	9.99 699	16	3	32.7	32.4	32.1
								4	43.6	43.2	42.8
45	9.07 018	106	9.07 320	108	0.92 680	9.99 698	15	5	54.5	54.0	53.5
46	9.07 124	107	9.07 428	108	0.92 572	9.99 696	14	6	65.4	64.8	64.2
47	9.07 231	106	9.07 536	107	0.92 464	9.99 695	13	7	76.3	75.6	74.9
48	9.07 337	105	9.07 643	108	0.92 357	9.99 693	12	8	87.2	86.4	85.6
49	9.07 442	106	9.07 751	107	0.92 249	9.99 692	11	9	98.1	97.2	96.3
									106	105	104
50	9.07 548	105	9.07 858	106	0.92 142	9.99 690	10				
51	9.07 653	105	9.07 964	107	0.92 036	9.99 689	9				
52	9.07 758	105	9.08 071	106	0.91 929	9.99 687	8	1	10.6	10.5	10.4
53	9.07 863	105	9.08 177	106	0.91 823	9.99 686	7	2	21.2	21.0	20.8
54	9.07 968	104	9.08 283	106	0.91 717	9.99 684	6	3	31.8	31.5	31.2
								4	42.4	42.0	41.6
55	9.08 072	104	9.08 389	106	0.91 611	9.99 683	5	5	53.0	52.5	52.0
56	9.08 176	104	9.08 495	105	0.91 505	9.99 681	4	6	63.6	63.0	62.4
57	9.08 280	103	9.08 600	105	0.91 400	9.99 680	3	7	74.2	73.5	72.8
58	9.08 383	103	9.08 705	105	0.91 295	9.99 678	2	8	84.8	84.0	83.2
59	9.08 486	103	9.08 810	104	0.91 190	9.99 677	1	9	95.4	94.5	93.6
60	9.08 589		9.08 914		0.91 086	9.99 675	0				
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.			

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TABLE II.—*Common logarithms of circular functions*—Continued

7°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.
0	9.08 589	103	9.08 914	105	0.91 086	9.99 675	60	
1	9.08 692	103	9.09 019	104	0.90 981	9.99 674	59	105 104 103
2	9.08 795	102	9.09 123	104	0.90 877	9.99 672	58	1 10.5 10.4 10.3
3	9.08 897	102	9.09 227	103	0.90 773	9.99 670	57	2 21.0 20.8 20.6
4	9.08 999	102	9.09 330	104	0.90 670	9.99 669	56	3 31.5 31.2 30.9
								4 42.0 41.6 41.2
5	9.09 101	101	9.09 434	103	0.90 566	9.99 667	55	5 52.5 52.0 51.5
6	9.09 202	102	9.09 537	103	0.90 463	9.99 666	54	6 63.0 62.4 61.8
7	9.09 304	101	9.09 640	102	0.90 360	9.99 664	53	7 73.5 72.8 72.1
8	9.09 405	101	9.09 742	103	0.90 258	9.99 663	52	8 84.0 83.2 82.4
9	9.09 506	100	9.09 845	102	0.90 155	9.99 661	51	9 94.5 93.6 92.7
10	9.09 606	101	9.09 947	102	0.90 053	9.99 659	50	
11	9.09 707	100	9.10 049	101	0.89 951	9.99 658	49	102 101 100
12	9.09 807	100	9.10 150	102	0.89 850	9.99 656	48	1 10.2 10.1 10.0
13	9.09 907	99	9.10 252	101	0.89 748	9.99 655	47	2 20.4 20.2 20.0
14	9.10 006	100	9.10 353	101	0.89 647	9.99 653	46	3 30.6 30.3 30.0
								4 40.8 40.4 40.0
15	9.10 106	99	9.10 454	101	0.89 546	9.99 651	45	5 51.0 50.5 50.0
16	9.10 205	99	9.10 555	101	0.89 445	9.99 650	44	6 61.2 60.6 60.0
17	9.10 304	98	9.10 656	100	0.89 344	9.99 648	43	7 71.4 70.7 70.0
18	9.10 402	99	9.10 756	100	0.89 244	9.99 647	42	8 81.6 80.8 80.0
19	9.10 501	98	9.10 856	100	0.89 144	9.99 645	41	9 91.8 90.9 90.0
20	9.10 599	98	9.10 956	100	0.89 044	9.99 643	40	
21	9.10 697	98	9.11 056	99	0.88 944	9.99 642	39	99 98
22	9.10 795	98	9.11 155	99	0.88 845	9.99 640	38	1 9.9 9.8
23	9.10 893	97	9.11 254	99	0.88 746	9.99 638	37	2 19.8 19.6
24	9.10 990	97	9.11 353	99	0.88 647	9.99 637	36	3 29.7 29.4
								4 39.6 39.2
25	9.11 087	97	9.11 452	99	0.88 548	9.99 635	35	5 49.5 49.0
26	9.11 184	97	9.11 551	98	0.88 449	9.99 633	34	6 59.4 58.8
27	9.11 281	96	9.11 649	98	0.88 351	9.99 632	33	7 69.3 68.6
28	9.11 377	97	9.11 747	98	0.88 253	9.99 630	32	8 79.2 78.4
29	9.11 474	96	9.11 845	98	0.88 155	9.99 629	31	9 89.1 88.2
30	9.11 570	96	9.11 943	97	0.88 057	9.99 627	30	
31	9.11 666	95	9.12 040	98	0.87 960	9.99 625	29	97 96 95
32	9.11 761	96	9.12 138	97	0.87 862	9.99 624	28	1 9.7 9.6 9.5
33	9.11 857	95	9.12 235	97	0.87 765	9.99 622	27	2 19.4 19.2 19.0
34	9.11 952	95	9.12 332	96	0.87 668	9.99 620	26	3 29.1 28.8 28.5
								4 38.8 38.4 38.0
35	9.12 047	95	9.12 428	97	0.87 572	9.99 618	25	5 48.5 48.0 47.5
36	9.12 142	94	9.12 525	96	0.87 475	9.99 617	24	6 58.2 57.6 57.0
37	9.12 236	95	9.12 621	96	0.87 379	9.99 615	23	7 67.9 67.2 66.5
38	9.12 331	94	9.12 717	96	0.87 283	9.99 613	22	8 77.6 76.8 76.0
39	9.12 425	94	9.12 813	96	0.87 187	9.99 612	21	9 87.3 86.4 85.5
40	9.12 519	93	9.12 909	95	0.87 091	9.99 610	20	
41	9.12 612	94	9.13 004	95	0.86 996	9.99 608	19	94 93 92
42	9.12 706	93	9.13 099	95	0.86 901	9.99 607	18	1 9.4 9.3 9.2
43	9.12 799	93	9.13 194	95	0.86 806	9.99 605	17	2 18.8 18.6 18.4
44	9.12 892	93	9.13 289	95	0.86 711	9.99 603	16	3 28.2 27.9 27.6
								4 37.6 37.2 36.8
45	9.12 985	93	9.13 384	94	0.86 616	9.99 601	15	5 47.0 46.5 46.0
46	9.13 078	93	9.13 478	95	0.86 522	9.99 600	14	6 56.4 55.8 55.2
47	9.13 171	92	9.13 573	94	0.86 427	9.99 598	13	7 65.8 65.1 64.4
48	9.13 263	92	9.13 667	94	0.86 333	9.99 596	12	8 75.2 74.4 73.6
49	9.13 355	92	9.13 761	93	0.86 239	9.99 595	11	9 84.6 83.7 82.8
50	9.13 447	92	9.13 854	94	0.86 146	9.99 593	10	
51	9.13 539	91	9.13 948	93	0.86 052	9.99 591	9	91 90 2
52	9.13 630	92	9.14 041	93	0.85 959	9.99 589	8	1 9.1 9.0 0.2
53	9.13 722	91	9.14 134	93	0.85 866	9.99 588	7	2 18.2 18.0 0.4
54	9.13 813	91	9.14 227	93	0.85 773	9.99 586	6	3 27.3 27.0 0.6
								4 36.4 36.0 0.8
55	9.13 904	90	9.14 320	92	0.85 680	9.99 584	5	5 45.5 45.0 1.0
56	9.13 994	91	9.14 412	92	0.85 588	9.99 582	4	6 54.6 54.0 1.2
57	9.14 085	90	9.14 504	93	0.85 496	9.99 581	3	7 63.7 63.0 1.4
58	9.14 175	91	9.14 597	91	0.85 403	9.99 579	2	8 72.8 72.0 1.6
59	9.14 266	90	9.14 688	92	0.85 312	9.99 577	1	9 81.9 81.0 1.8
60	9.14 356		9.14 780		0.85 220	9.99 575	0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

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′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.
0	9.14 356		9.14 780		0.85 220	9.99 575	60	
1	9.14 445	89	9.14 872	92	0.85 128	9.99 574	59	92 91 90
2	9.14 535	90	9.14 963	91	0.85 037	9.99 572	58	1 9.2 9.1 9.0
3	9.14 624	89	9.15 054	91	0.84 946	9.99 570	57	2 18.4 18.2 18.0
4	9.14 714	90	9.15 145	91	0.84 855	9.99 568	56	3 27.6 27.3 27.0
		89						4 36.8 36.4 36.0
5	9.14 803		9.15 236		0.84 764	9.99 566	55	5 46.0 45.5 45.0
6	9.14 891	88	9.15 327	91	0.84 673	9.99 565	54	6 55.2 54.6 54.0
7	9.14 980	89	9.15 417	90	0.84 583	9.99 563	53	7 64.4 63.7 63.0
8	9.15 069	89	9.15 508	91	0.84 492	9.99 561	52	8 73.6 72.8 72.0
9	9.15 157	88	9.15 598	90	0.84 402	9.99 559	51	9 82.8 81.9 81.0
		88		90				
10	9.15 245		9.15 688		0.84 312	9.99 557	50	89 88
11	9.15 333	88	9.15 777	89	0.84 223	9.99 556	49	
12	9.15 421	88	9.15 867	90	0.84 133	9.99 554	48	1 8.9 8.8
13	9.15 508	87	9.15 956	89	0.84 044	9.99 552	47	2 17.8 17.6
14	9.15 596	88	9.16 046	90	0.83 954	9.99 550	46	3 26.7 26.4
		87		89				4 35.6 35.2
15	9.15 683		9.16 135		0.83 865	9.99 548	45	5 44.5 44.0
16	9.15 770	87	9.16 224	89	0.83 776	9.99 546	44	6 53.4 52.8
17	9.15 857	87	9.16 312	88	0.83 688	9.99 545	43	7 62.3 61.6
18	9.15 944	87	9.16 401	89	0.83 599	9.99 543	42	8 71.2 70.4
19	9.16 030	86	9.16 489	88	0.83 511	9.99 541	41	9 80.1 79.2
		86		88				
20	9.16 116		9.16 577		0.83 423	9.99 539	40	87 86
21	9.16 203	87	9.16 665	88	0.83 335	9.99 537	39	
22	9.16 289	86	9.16 753	88	0.83 247	9.99 535	38	1 8.7 8.6
23	9.16 374	85	9.16 841	88	0.83 159	9.99 533	37	2 17.4 17.2
24	9.16 460	86	9.16 928	87	0.83 072	9.99 532	36	3 26.1 25.8
		85		88				4 34.8 34.4
25	9.16 545		9.17 016		0.82 984	9.99 530	35	5 43.5 43.0
26	9.16 631	86	9.17 103	87	0.82 897	9.99 528	34	6 52.2 51.6
27	9.16 716	85	9.17 190	87	0.82 810	9.99 526	33	7 60.9 60.2
28	9.16 801	85	9.17 277	86	0.82 723	9.99 524	32	8 69.6 68.8
29	9.16 886	85	9.17 363	87	0.82 637	9.99 522	31	9 78.3 77.4
		84						
30	9.16 970		9.17 450		0.82 550	9.99 520	30	85 84
31	9.17 055	85	9.17 536	86	0.82 464	9.99 518	29	
32	9.17 139	84	9.17 622	86	0.82 378	9.99 517	28	1 8.5 8.4
33	9.17 223	84	9.17 708	86	0.82 292	9.99 515	27	2 17.0 16.8
34	9.17 307	84	9.17 794	86	0.82 206	9.99 513	26	3 25.5 25.2
		84		86				4 34.0 33.6
35	9.17 391		9.17 880		0.82 120	9.99 511	25	5 42.5 42.0
36	9.17 474	83	9.17 965	85	0.82 035	9.99 509	24	6 51.0 50.4
37	9.17 558	84	9.18 051	86	0.81 949	9.99 507	23	7 59.5 58.8
38	9.17 641	83	9.18 136	85	0.81 864	9.99 505	22	8 68.0 67.2
39	9.17 724	83	9.18 221	85	0.81 779	9.99 503	21	9 76.5 75.6
		83		85				
40	9.17 807		9.18 306		0.81 694	9.99 501	20	83 82
41	9.17 890	83	9.18 391	85	0.81 609	9.99 499	19	
42	9.17 973	83	9.18 475	84	0.81 525	9.99 497	18	1 8.3 8.2
43	9.18 055	82	9.18 560	85	0.81 440	9.99 495	17	2 16.6 16.4
44	9.18 137	82	9.18 644	84	0.81 356	9.99 494	16	3 24.9 24.6
		83		84				4 33.2 32.8
45	9.18 220		9.18 728		0.81 272	9.99 492	15	5 41.5 41.0
46	9.18 302	82	9.18 812	84	0.81 188	9.99 490	14	6 49.8 49.2
47	9.18 383	81	9.18 896	84	0.81 104	9.99 488	13	7 58.1 57.4
48	9.18 465	82	9.18 979	83	0.81 021	9.99 486	12	8 66.4 65.6
49	9.18 547	82	9.19 063	84	0.80 937	9.99 484	11	9 74.7 73.8
		81		83				
50	9.18 628		9.19 146		0.80 854	9.99 482	10	81 80 2
51	9.18 709	81	9.19 229	83	0.80 771	9.99 480	9	
52	9.18 790	81	9.19 312	83	0.80 688	9.99 478	8	1 8.1 8.0 0.2
53	9.18 871	81	9.19 395	83	0.80 605	9.99 476	7	2 16.2 16.0 0.4
54	9.18 952	81	9.19 478	83	0.80 522	9.99 474	6	3 24.3 24.0 0.6
		81		83				4 32.4 32.0 0.8
55	9.19 033		9.19 561		0.80 439	9.99 472	5	5 40.5 40.0 1.0
56	9.19 113	80	9.19 643	82	0.80 357	9.99 470	4	6 48.6 48.0 1.2
57	9.19 193	80	9.19 725	82	0.80 275	9.99 468	3	7 56.7 56.0 1.4
58	9.19 273	80	9.19 807	82	0.80 193	9.99 466	2	8 64.8 64.0 1.6
59	9.19 353	80	9.19 889	82	0.80 111	9.99 464	1	9 72.9 72.0 1.8
		80		82				
60	9.19 433		9.19 971		0.80 029	9.99 462	0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

9°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
									82	81	80
0	9.19 433	80	9.19 971	82	0.80 029	9.99 462	60				
1	9.19 513	79	9.20 053	81	0.79 947	9.99 460	59	1	8.2	8.1	8.0
2	9.19 592	80	9.20 134	82	0.79 866	9.99 458	58	2	16.4	16.2	16.0
3	9.19 672	79	9.20 216	81	0.79 784	9.99 456	57	3	24.6	24.3	24.0
4	9.19 751	79	9.20 297	81	0.79 703	9.99 454	56	4	32.8	32.4	32.0
5	9.19 830	79	9.20 378	81	0.79 622	9.99 452	55	5	41.0	40.5	40.0
6	9.19 909	79	9.20 459	81	0.79 541	9.99 450	54	6	49.2	48.6	48.0
7	9.19 988	79	9.20 540	81	0.79 460	9.99 448	53	7	57.4	56.7	56.0
8	9.20 067	78	9.20 621	80	0.79 379	9.99 446	52	8	65.6	64.8	64.0
9	9.20 145	78	9.20 701	81	0.79 299	9.99 444	51	9	73.8	72.9	72.0
									79	78	
10	9.20 223	79	9.20 782	80	0.79 218	9.99 442	50				
11	9.20 302	78	9.20 862	80	0.79 138	9.99 440	49	1	7.9	7.8	
12	9.20 380	78	9.20 942	80	0.79 058	9.99 438	48	2	15.8	15.6	
13	9.20 458	77	9.21 022	80	0.78 978	9.99 436	47	3	23.7	23.4	
14	9.20 535	78	9.21 102	80	0.78 898	9.99 434	46	4	31.6	31.2	
15	9.20 613	78	9.21 182	79	0.78 818	9.99 432	45	5	39.5	39.0	
16	9.20 691	77	9.21 261	80	0.78 739	9.99 429	44	6	47.4	46.8	
17	9.20 768	77	9.21 341	79	0.78 659	9.99 427	43	7	55.3	54.6	
18	9.20 845	77	9.21 420	79	0.78 580	9.99 425	42	8	63.2	62.4	
19	9.20 922	77	9.21 499	79	0.78 501	9.99 423	41	9	71.1	70.2	
									77	76	
20	9.20 999	77	9.21 578	79	0.78 422	9.99 421	40				
21	9.21 076	77	9.21 657	79	0.78 343	9.99 419	39	1	7.7	7.6	
22	9.21 153	76	9.21 736	78	0.78 264	9.99 417	38	2	15.4	15.2	
23	9.21 229	77	9.21 814	79	0.78 186	9.99 415	37	3	23.1	22.8	
24	9.21 306	76	9.21 893	78	0.78 107	9.99 413	36	4	30.8	30.4	
25	9.21 382	76	9.21 971	78	0.78 029	9.99 411	35	5	38.5	38.0	
26	9.21 458	76	9.22 049	78	0.77 951	9.99 409	34	6	46.2	45.6	
27	9.21 534	76	9.22 127	78	0.77 873	9.99 407	33	7	53.9	53.2	
28	9.21 610	75	9.22 205	78	0.77 795	9.99 404	32	8	61.6	60.8	
29	9.21 685	76	9.22 283	78	0.77 717	9.99 402	31	9	69.3	68.4	
									75	74	
30	9.21 761	75	9.22 361	77	0.77 639	9.99 400	30				
31	9.21 836	76	9.22 438	78	0.77 562	9.99 398	29	1	7.5	7.4	
32	9.21 912	75	9.22 516	77	0.77 484	9.99 396	28	2	15.0	14.8	
33	9.21 987	75	9.22 593	77	0.77 407	9.99 394	27	3	22.5	22.2	
34	9.22 062	75	9.22 670	77	0.77 330	9.99 392	26	4	30.0	29.6	
35	9.22 137	74	9.22 747	77	0.77 253	9.99 390	25	5	37.5	37.0	
36	9.22 211	75	9.22 824	77	0.77 176	9.99 388	24	6	45.0	44.4	
37	9.22 286	75	9.22 901	76	0.77 099	9.99 385	23	7	52.5	51.8	
38	9.22 361	74	9.22 977	77	0.77 023	9.99 383	22	8	60.0	59.2	
39	9.22 435	74	9.23 054	76	0.76 946	9.99 381	21	9	67.5	66.6	
									73	72	
40	9.22 509	74	9.23 130	76	0.76 870	9.99 379	20				
41	9.22 583	74	9.23 206	77	0.76 794	9.99 377	19	1	7.3	7.2	
42	9.22 657	74	9.23 283	76	0.76 717	9.99 375	18	2	14.6	14.4	
43	9.22 731	74	9.23 359	76	0.76 641	9.99 372	17	3	21.9	21.6	
44	9.22 805	73	9.23 435	75	0.76 565	9.99 370	16	4	29.2	28.8	
45	9.22 878	74	9.23 510	76	0.76 490	9.99 368	15	5	36.5	36.0	
46	9.22 952	73	9.23 586	75	0.76 414	9.99 366	14	6	43.8	43.2	
47	9.23 025	73	9.23 661	76	0.76 339	9.99 364	13	7	51.1	50.4	
48	9.23 098	73	9.23 737	75	0.76 263	9.99 362	12	8	58.4	57.6	
49	9.23 171	73	9.23 812	75	0.76 188	9.99 359	11	9	65.7	64.8	
									71	3	2
50	9.23 244	73	9.23 887	75	0.76 113	9.99 357	10				
51	9.23 317	73	9.23 962	75	0.76 038	9.99 355	9	1	7.1	0.3	0.2
52	9.23 390	72	9.24 037	75	0.75 963	9.99 353	8	2	14.2	0.6	0.4
53	9.23 462	73	9.24 112	74	0.75 888	9.99 351	7	3	21.3	0.9	0.6
54	9.23 535	72	9.24 186	75	0.75 814	9.99 348	6	4	28.4	1.2	0.8
55	9.23 607	72	9.24 261	74	0.75 739	9.99 346	5	5	35.5	1.5	1.0
56	9.23 679	73	9.24 335	75	0.75 665	9.99 344	4	6	42.6	1.8	1.2
57	9.23 752	71	9.24 410	74	0.75 590	9.99 342	3	7	49.7	2.1	1.4
58	9.23 823	72	9.24 484	74	0.75 516	9.99 340	2	8	56.8	2.4	1.6
59	9.23 895	72	9.24 558	74	0.75 442	9.99 337	1	9	63.9	2.7	1.8
60	9.23 967		9.24 632		0.75 368	9.99 335	0				
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.			

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TABLE II.—*Common logarithms of circular functions*—Continued

10°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
									74	73
0	9.23 967	72	9.24 632	74	0.75 368	9.99 335	60			
1	9.24 039	71	9.24 706	73	0.75 294	9.99 333	59			
2	9.24 110	71	9.24 779	74	0.75 221	9.99 331	58	1	7.4	7.3
3	9.24 181	72	9.24 853	73	0.75 147	9.99 328	57	2	14.8	14.6
4	9.24 253	71	9.24 926	74	0.75 074	9.99 326	56	3	22.2	21.9
								4	29.6	29.2
5	9.24 324	71	9.25 000	73	0.75 000	9.99 324	55	5	37.0	36.5
6	9.24 395	71	9.25 073	73	0.74 927	9.99 322	54	6	44.4	43.8
7	9.24 466	70	9.25 146	73	0.74 854	9.99 319	53	7	51.8	51.1
8	9.24 536	71	9.25 219	73	0.74 781	9.99 317	52	8	59.2	58.4
9	9.24 607	70	9.25 292	73	0.74 708	9.99 315	51	9	66.6	65.7
									72	71
10	9.24 677	71	9.25 365	72	0.74 635	9.99 313	50			
11	9.24 748	70	9.25 437	73	0.74 563	9.99 310	49			
12	9.24 818	70	9.25 510	72	0.74 490	9.99 308	48	1	7.2	7.1
13	9.24 888	70	9.25 582	73	0.74 418	9.99 306	47	2	14.4	14.2
14	9.24 958	70	9.25 655	72	0.74 345	9.99 304	46	3	21.6	21.3
								4	28.8	28.4
15	9.25 028	70	9.25 727	72	0.74 273	9.99 301	45	5	36.0	35.5
16	9.25 098	70	9.25 799	72	0.74 201	9.99 299	44	6	43.2	42.6
17	9.25 168	69	9.25 871	72	0.74 129	9.99 297	43	7	50.4	49.7
18	9.25 237	70	9.25 943	72	0.74 057	9.99 294	42	8	57.6	56.8
19	9.25 307	69	9.26 015	71	0.73 985	9.99 292	41	9	64.8	63.9
									70	69
20	9.25 376	69	9.26 086	72	0.73 914	9.99 290	40			
21	9.25 445	69	9.26 158	71	0.73 842	9.99 288	39			
22	9.25 514	69	9.26 229	72	0.73 771	9.99 285	38	1	7.0	6.9
23	9.25 583	69	9.26 301	71	0.73 699	9.99 283	37	2	14.0	13.8
24	9.25 652	69	9.26 372	71	0.73 628	9.99 281	36	3	21.0	20.7
								4	28.0	27.6
25	9.25 721	69	9.26 443	71	0.73 557	9.99 278	35	5	35.0	34.5
26	9.25 790	68	9.26 514	71	0.73 486	9.99 276	34	6	42.0	41.4
27	9.25 858	69	9.26 585	70	0.73 415	9.99 274	33	7	49.0	48.3
28	9.25 927	68	9.26 655	71	0.73 345	9.99 271	32	8	56.0	55.2
29	9.25 995	68	9.26 726	71	0.73 274	9.99 269	31	9	63.0	62.1
									68	67
30	9.26 063	68	9.26 797	70	0.73 203	9.99 267	30			
31	9.26 131	68	9.26 867	70	0.73 133	9.99 264	29			
32	9.26 199	68	9.26 937	71	0.73 063	9.99 262	28	1	6.8	6.7
33	9.26 267	68	9.27 008	70	0.72 992	9.99 260	27	2	13.6	13.4
34	9.26 335	68	9.27 078	70	0.72 922	9.99 257	26	3	20.4	20.1
								4	27.2	26.8
35	9.26 403	67	9.27 148	70	0.72 852	9.99 255	25	5	34.0	33.5
36	9.26 470	68	9.27 218	70	0.72 782	9.99 252	24	6	40.8	40.2
37	9.26 538	67	9.27 288	69	0.72 712	9.99 250	23	7	47.6	46.9
38	9.26 605	67	9.27 357	70	0.72 643	9.99 248	22	8	54.4	53.6
39	9.26 672	67	9.27 427	69	0.72 573	9.99 245	21	9	61.2	60.3
									66	65
40	9.26 739	67	9.27 496	70	0.72 504	9.99 243	20			
41	9.26 806	67	9.27 566	69	0.72 434	9.99 241	19			
42	9.26 873	67	9.27 635	69	0.72 365	9.99 238	18	1	6.6	6.5
43	9.26 940	67	9.27 704	69	0.72 296	9.99 236	17	2	13.2	13.0
44	9.27 007	66	9.27 773	69	0.72 227	9.99 233	16	3	19.8	19.5
								4	26.4	26.0
45	9.27 073	67	9.27 842	69	0.72 158	9.99 231	15	5	33.0	32.5
46	9.27 140	66	9.27 911	69	0.72 089	9.99 229	14	6	39.6	39.0
47	9.27 206	67	9.27 980	69	0.72 020	9.99 226	13	7	46.2	45.5
48	9.27 273	66	9.28 049	68	0.71 951	9.99 224	12	8	52.8	52.0
49	9.27 339	66	9.28 117	69	0.71 883	9.99 221	11	9	59.4	58.5
									3	2
50	9.27 405	66	9.28 186	68	0.71 814	9.99 219	10			
51	9.27 471	66	9.28 254	69	0.71 746	9.99 217	9			
52	9.27 537	65	9.28 323	68	0.71 677	9.99 214	8	1	0.3	0.2
53	9.27 602	66	9.28 391	68	0.71 609	9.99 212	7	2	0.6	0.4
54	9.27 668	66	9.28 459	68	0.71 541	9.99 209	6	3	0.9	0.6
								4	1.2	0.8
55	9.27 734	65	9.28 527	68	0.71 473	9.99 207	5	5	1.5	1.0
56	9.27 799	65	9.28 595	67	0.71 405	9 99 204	4	6	1.8	1.2
57	9.27 864	66	9.28 662	68	0.71 338	9.99 202	3	7	2.1	1.4
58	9.27 930	65	9.28 730	68	0.71 270	9.99 200	2	8	2.4	1.6
59	9.27 995	65	9.28 798	67	0.71 202	9.99 197	1	9	2.7	1.8
60	9.28 060		9.28 865		0.71 135	9.99 195	0			
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.		

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TABLE II.—*Common logarithms of circular functions*—Continued

11°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.	
								68	67
0	9.28 060	65	9.28 865	68	0.71 135	9.99 195	60		
1	9.28 125	65	9.28 933	67	0.71 067	9.99 192	59		
2	9.28 190	64	9.29 000	67	0.71 000	9.99 190	58	1 6.8	6.7
3	9.28 254	65	9.29 067	67	0.70 933	9.99 187	57	2 13.6	13.4
4	9.28 319	65	9.29 134	67	0.70 866	9.99 185	56	3 20.4	20.1
								4 27.2	26.8
5	9.28 384	64	9.29 201	67	0.70 799	9.99 182	55	5 34.0	33.5
6	9.28 448	64	9.29 268	67	0.70 732	9.99 180	54	6 40.8	40.2
7	9.28 512	65	9.29 335	67	0.70 665	9.99 177	53	7 47.6	46.9
8	9.28 577	64	9.29 402	66	0.70 598	9.99 175	52	8 54.4	53.6
9	9.28 641	64	9.29 468	67	0.70 532	9.99 172	51	9 61.2	60.3
								66	65
10	9.28 705	64	9.29 535	66	0.70 465	9.99 170	50		
11	9.28 769	64	9.29 601	67	0.70 399	9.99 167	49		
12	9.28 833	63	9.29 668	66	0.70 332	9.99 165	48	1 6.6	6.5
13	9.28 896	64	9.29 734	66	0.70 266	9.99 162	47	2 13.2	13.0
14	9.28 960	64	9.29 800	66	0.70 200	9.99 160	46	3 19.8	19.5
								4 26.4	26.0
15	9.29 024	63	9.29 866	66	0.70 134	9.99 157	45	5 33.0	32.5
16	9.29 087	63	9.29 932	66	0.70 068	9.99 155	44	6 39.6	39.0
17	9.29 150	64	9.29 998	66	0.70 002	9.99 152	43	7 46.2	45.5
18	9.29 214	63	9.30 064	66	0.69 936	9.99 150	42	8 52.8	52.0
19	9.29 277	63	9.30 130	65	0.69 870	9.99 147	41	9 59.4	58.5
								64	63
20	9.29 340	63	9.30 195	66	0.69 805	9.99 145	40		
21	9.29 403	63	9.30 261	65	0.69 739	9.99 142	39		
22	9.29 466	63	9.30 326	65	0.69 674	9.99 140	38	1 6.4	6.3
23	9.29 529	62	9.30 391	66	0.69 609	9.99 137	37	2 12.8	12.6
24	9.29 591	63	9.30 457	65	0.69 543	9.99 135	36	3 19.2	18.9
								4 25.6	25.2
25	9.29 654	62	9.30 522	65	0.69 478	9.99 132	35	5 32.0	31.5
26	9.29 716	63	9.30 587	65	0.69 413	9.99 130	34	6 38.4	37.8
27	9.29 779	62	9.30 652	65	0.69 348	9.99 127	33	7 44.8	44.1
28	9.29 841	62	9.30 717	65	0.69 283	9.99 124	32	8 51.2	50.4
29	9.29 903	63	9.30 782	64	0.69 218	9.99 122	31	9 57.6	56.7
								62	61
30	9.29 966	62	9.30 846	65	0.69 154	9.99 119	30		
31	9.30 028	62	9.30 911	64	0.69 089	9.99 117	29		
32	9.30 090	61	9.30 975	65	0.69 025	9.99 114	28	1 6.2	6.1
33	9.30 151	62	9.31 040	64	0.68 960	9.99 112	27	2 12.4	12.2
34	9.30 213	62	9.31 104	64	0.68 896	9.99 109	26	3 18.6	18.3
								4 24.8	24.4
35	9.30 275	61	9.31 168	65	0.68 832	9.99 106	25	5 31.0	30.5
36	9.30 336	62	9.31 233	64	0.68 767	9.99 104	24	6 37.2	36.6
37	9.30 398	61	9.31 297	64	0.68 703	9.99 101	23	7 43.4	42.7
38	9.30 459	62	9.31 361	64	0.68 639	9.99 099	22	8 49.6	48.8
39	9.30 521	61	9.31 425	64	0.68 575	9.99 096	21	9 55.8	54.9
								60	59
40	9.30 582	61	9.31 489	63	0.68 511	9.99 093	20		
41	9.30 643	61	9.31 552	64	0.68 448	9.99 091	19		
42	9.30 704	61	9.31 616	63	0.68 384	9.99 088	18	1 6.0	5.9
43	9.30 765	61	9.31 679	64	0.68 321	9.99 086	17	2 12.0	11.8
44	9.30 826	61	9.31 743	63	0.68 257	9.99 083	16	3 18.0	17.7
								4 24.0	23.6
45	9.30 887	60	9.31 806	64	0.68 194	9.99 080	15	5 30.0	29.5
46	9.30 947	61	9.31 870	63	0.68 130	9.99 078	14	6 36.0	35.4
47	9.31 008	60	9.31 933	63	0.68 067	9.99 075	13	7 42.0	41.3
48	9.31 068	61	9.31 996	63	0.68 004	9.99 072	12	8 48.0	47.2
49	9.31 129	60	9.32 059	63	0.67 941	9.99 070	11	9 54.0	53.1
								3	2
50	9.31 189	61	9.32 122	63	0.67 878	9.99 067	10		
51	9.31 250	60	9.32 185	63	0.67 815	9.99 064	9		
52	9.31 310	60	9.32 248	63	0.67 752	9.99 062	8	1 0.3	0.2
53	9.31 370	60	9.32 311	62	0.67 689	9.99 059	7	2 0.6	0.4
54	9.31 430	60	9.32 373	63	0.67 627	9.99 056	6	3 0.9	0.6
								4 1.2	0.8
55	9.31 490	59	9.32 436	62	0.67 564	9.99 054	5	5 1.5	1.0
56	9.31 549	60	9.32 498	63	0.67 502	9.99 051	4	6 1.8	1.2
57	9.31 609	60	9.32 561	62	0.67 439	9.99 048	3	7 2.1	1.4
58	9.31 669	59	9.32 623	62	0.67 377	9.99 046	2	8 2.4	1.6
59	9.31 728	60	9.32 685	62	0.67 315	9.99 043	1	9 2.7	1.8
60	9.31 788		9.32 747		0.67 253	9.99 040	0		
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.	

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TABLE II.—*Common logarithms of circular functions*—Continued

12°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
0	9.31 788	59	9.32 747	63	0.67 253	9.99.040	60		63	62
1	9.31 847	60	9.32 810	62	0.67 190	9.99 038	59			
2	9.31 907	59	9.32 872	61	0.67 128	9.99 035	58	1	6.3	6.2
3	9.31 966	59	9.32 933	62	0.67 067	9.99 032	57	2	12.6	12.4
4	9.32 025	59	9.32 995	62	0.67 005	9.99 030	56	3	18.9	18.6
5	9.32 084	59	9.33 057	62	0.66 943	9.99 027	55	4	25.2	24.8
6	9.32 143	59	9.33 119	61	0.66 881	9.99 024	54	5	31.5	31.0
7	9.32 202	59	9.33 180	62	0.66 820	9.99 022	53	6	37.8	37.2
8	9.32 261	58	9.33 242	61	0.66 758	9.99 019	52	7	44.1	43.4
9	9.32 319	59	9.33 303	62	0.66 697	9.99 016	51	8	50.4	49.6
10	9.32 378	59	9.33 365	61	0.66 635	9.99 013	50	9	56.7	55.8
11	9.32 437	58	9.33 426	61	0.66 574	9.99 011	49		61	60
12	9.32 495	58	9.33 487	61	0.66 513	9.99 008	48	1	6.1	6.0
13	9.32 553	59	9.33 548	61	0.66 452	9.99 005	47	2	12.2	12.0
14	9.32 612	58	9.33 609	61	0.66 391	9.99 002	46	3	18.3	18.0
15	9.32 670	58	9.33 670	61	0.66 330	9.99 000	45	4	24.4	24.0
16	9.32 728	58	9.33 731	61	0.66 269	9.98 997	44	5	30.5	30.0
17	9.32 786	58	9.33 792	61	0.66 208	9.98 994	43	6	36.6	36.0
18	9.32 844	58	9.33 853	60	0.66 147	9.98 991	42	7	42.7	42.0
19	9.32 902	58	9.33 913	61	0.66 087	9.98 989	41	8	48.8	48.0
20	9.32 960	58	9.33 974	60	0.66 026	9.98 986	40	9	54.9	54.0
21	9.33 018	57	9.34 034	61	0.65 966	9.98 983	39			59
22	9.33 075	58	9.34 095	60	0.65 905	9.98 980	38		1	5.9
23	9.33 133	57	9.34 155	60	0.65 845	9.98 978	37		2	11.8
24	9.33 190	58	9.34 215	61	0.65 785	9.98 975	36		3	17.7
25	9.33 248	57	9.34 276	60	0.65 724	9.98 972	35		4	23.6
26	9.33 305	57	9.34 336	60	0.65 664	9.98 969	34		5	29.5
27	9.33 362	58	9.34 396	60	0.65 604	9.98 967	33		6	35.4
28	9.33 420	57	9.34 456	60	0.65 544	9.98 964	32		7	41.3
29	9.33 477	57	9.34 516	60	0.65 484	9.98 961	31		8	47.2
30	9.33 534	57	9.34 576	59	0.65 424	9.98 958	30		9	53.1
31	9.33 591	56	9 34 635	60	0.65 365	9.98 955	29		58	57
32	9.33 647	57	9.34 695	60	0.65 305	9.98 953	28	1	5.8	5.7
33	9.33 704	57	9.34 755	59	0.65 245	9.98 950	27	2	11.6	11.4
34	9.33 761	57	9.34 814	60	0.65 186	9.98 947	26	3	17.4	17.1
35	9.33 818	56	9.34 874	59	0.65 126	9.98 944	25	4	23.2	22.8
36	9.33 874	57	9.34 933	59	0.65 067	9.98 941	24	5	29.0	28.5
37	9.33 931	56	9.34 992	59	0.65 008	9.98 938	23	6	34.8	34.2
38	9.33 987	56	9.35 051	60	0.64 949	9.98 936	22	7	40.6	39.9
39	9.34 043	57	9.35 111	59	0.64 889	9.98 933	21	8	46.4	45.6
40	9.34 100	56	9.35 170	59	0.64 830	9.98 930	20	9	52.2	51.3
41	9.34 156	56	9.35 229	59	0.64 771	9.98 927	19		56	55
42	9.34 212	56	9.35 288	59	0.64 712	9.98 924	18	1	5.6	5.5
43	9.34 268	56	9.35 347	58	0.64 653	9.98 921	17	2	11.2	11.0
44	9.34 324	56	9.35 405	59	0.64 595	9.98 919	16	3	16.8	16.5
45	9.34 380	56	9.35 464	59	0.64 536	9.98 916	15	4	22.4	22.0
46	9.34 436	55	9.35 523	58	0.64 477	9.98 913	14	5	28.0	27.5
47	9.34 491	56	9.35 581	59	0.64 419	9.98 910	13	6	33.6	33.0
48	9.34 547	55	9.35 640	58	0.64 360	9.98 907	12	7	39.2	38.5
49	9.34 602	56	9.35 698	59	0.64 302	9.98 904	11	8	44.8	44.0
50	9.34 658	55	9.35 757	58	0.64 243	9.98 901	10	9	50.4	49.5
51	9.34 713	56	9.35 815	58	0.64 185	9.98 898	9		3	2
52	9.34 769	55	9.35 873	58	0.64 127	9.98 896	8	1	0.3	0.2
53	9.34 824	55	9.35 931	58	0.64 069	9.98 893	7	2	0.6	0.4
54	9.34 879	55	9.35 989	58	0.64 011	9.98 890	6	3	0.9	0.6
55	9.34 934	55	9.36 047	58	0.63 953	9.98 887	5	4	1.2	0.8
56	9.34 989	55	9.36 105	58	0.63 895	9.98 884	4	5	1.5	1.0
57	9.35 044	55	9.36 163	58	0.63 837	9.98 881	3	6	1.8	1.2
58	9.35 099	55	9.36 221	58	0.63 779	9.98 878	2	7	2.1	1.4
59	9.35 154	55	9.36 279	57	0.63 721	9.98 875	1	8	2.4	1.6
60	9.35 209		9.36 336		0.63 664	9.98 872	0	9	2.7	1.8
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.		

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TABLE II.—*Common logarithms of circular functions*—Continued

13°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.		Prop. Pts.		
									58	57
0	9.35 209		9.36 336		0.63 664	9.98 872	60			
1	9.35 263	54	9.36 394	58	0.63 606	9.98 869	59			
2	9.35 318	55	9.36 452	58	0.63 548	9.98 867	58	1	5.8	5.7
3	9.35 373	55	9.36 509	57	0.63 491	9.98 864	57	2	11.6	11.4
4	9.35 427	54	9.36 566	57	0.63 434	9.98 861	56	3	17.4	17.1
		54		58				4	23.2	22.8
5	9.35 481		9.36 624		0.63 376	9.98 858	55	5	29.0	28.5
6	9.35 536	55	9.36 681	57	0.63 319	9.98 855	54	6	34.8	34.2
7	9.35 590	54	9.36 738	57	0.63 262	9.98 852	53	7	40.6	39.9
8	9.35 644	54	9.36 795	57	0.63 205	9.98 849	52	8	46.4	45.6
9	9.35 698	54	9.36 852	57	0.63 148	9.98 846	51	9	52.2	51.3
		54		57						
10	9.35 752		9.36 909		0.63 091	9.98 843	50			
11	9.35 806	54	9.36 966	57	0.63 034	9.98 840	49		56	55
12	9.35 860	54	9.37 023	57	0.62 977	9.98 837	48	1	5.6	5.5
13	9.35 914	54	9.37 080	57	0.62 920	9.98 834	47	2	11.2	11.0
14	9.35 968	54	9.37 137	57	0.62 863	9.98 831	46	3	16.8	16.5
		54		56				4	22.4	22.0
15	9.36 022		9.37 193		0.62 807	9.98 828	45	5	28.0	27.5
16	9.36 075	53	9.37 250	57	0.62 750	9.98 825	44	6	33.6	33.0
17	9.36 129	54	9.37 306	56	0.62 694	9.98 822	43	7	39.2	38.5
18	9.36 182	53	9.37 363	57	0.62 637	9.98 819	42	8	44.8	44.0
19	9.36 236	54	9.37 419	56	0.62 581	9.98 816	41	9	50.4	49.5
		53		57						
20	9.36 289		9.37 476		0.62 524	9.98 813	40			
21	9.36 342	53	9.37 532	56	0.62 468	9.98 810	39		54	
22	9.36 395	53	9.37 588	56	0.62 412	9.98 807	38	1	5.4	
23	9.36 449	54	9.37 644	56	0.62 356	9.98 804	37	2	10.8	
24	9.36 502	53	9.37 700	56	0.62 300	9.98 801	36	3	16.2	
		53		56				4	21.6	
25	9.36 555		9.37 756		0.62 244	9.98 798	35	5	27.0	
26	9.36 608	53	9.37 812	56	0.62 188	9.98 795	34	6	32.4	
27	9.36 660	52	9.37 868	56	0.62 132	9.98 792	33	7	37.8	
28	9.36 713	53	9.37 924	56	0.62 076	9.98 789	32	8	43.2	
29	9.36 766	53	9.37 980	56	0.62 020	9.98 786	31	9	48.6	
		53		55						
30	9.36 819		9.38 035		0.61 965	9.98 783	30			
31	9.36 871	52	9.38 091	56	0.61 909	9.98 780	29		53	52
32	9.36 924	53	9.38 147	56	0.61 853	9.98 777	28	1	5.3	5.2
33	9.36 976	52	9.38 202	55	0.61 798	9.98 774	27	2	10.6	10.4
34	9.37 028	52	9.38 257	55	0.61 743	9.98 771	26	3	15.9	15.6
		53		56				4	21.2	20.8
35	9 37 081		9.38 313		0.61 687	9.98 768	25	5	26.5	26.0
36	9.37 133	52	9.38 368	55	0.61 632	9.98 765	24	6	31.8	31.2
37	9.37 185	52	9.38 423	55	0.61 577	9.98 762	23	7	37.1	36.4
38	9.37 237	52	9.38 479	56	0.61 521	9.98 759	22	8	42.4	41.6
39	9.37 289	52	9.38 534	55	0.61 466	9.98 756	21	9	47.7	46.8
		52		55						
40	9.37 341		9.38 589		0.61 411	9.98 753	20			
41	9.37 393	52	9.38 644	55	0.61 356	9.98 750	19		51	4
42	9.37 445	52	9.38 699	55	0.61 301	9.98 746	18	1	5.1	0.4
43	9.37 497	52	9.38 754	55	0.61 246	9.98 743	17	2	10.2	0.8
44	9.37 549	52	9.38 808	54	0.61 192	9.98 740	16	3	15.3	1.2
		51		55				4	20.4	1.6
45	9.37 600		9.38 863		0.61 137	9.98 737	15	5	25.5	2.0
46	9.37 652	52	9.38 918	55	0.61 082	9.98 734	14	6	30.6	2.4
47	9.37 703	51	9.38 972	54	0.61 028	9.98 731	13	7	35.7	2.8
48	9.37 755	52	9.39 027	55	0.60 973	9.98 728	12	8	40.8	3.2
49	9.37 806	51	9.39 082	55	0.60 918	9.98 725	11	9	45.9	3.6
		52		54						
50	9.37 858		9.39 136		0.60 864	9.98 722	10			
51	9.37 909	51	9.39 190	54	0.60 810	9.98 719	9		3	2
52	9.37 960	51	9.39 245	55	0.60 755	9.98 715	8	1	0.3	0.2
53	9.38 011	51	9.39 299	54	0.60 701	9.98 712	7	2	0.6	0.4
54	9.38 062	51	9.39 353	54	0.60 647	9.98 709	6	3	0.9	0.6
		51		54				4	1.2	0.8
55	9.38 113		9.39 407		0.60 593	9.98 706	5	5	1.5	1.0
56	9.38 164	51	9.39 461	54	0.60 539	9.98 703	4	6	1.8	1.2
57	9.38 215	51	9.39 515	54	0.60 485	9.98 700	3	7	2.1	1.4
58	9.38 266	51	9.39 569	54	0.60 431	9.98 697	2	8	2.4	1.6
59	9.38 317	51	9.39 623	54	0.60 377	9.98 694	1	9	2.7	1.8
60	9.38 368		9.39 677		0.60 323	9.98 690	0			
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	′	Prop. Pts.		

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TABLE II.—*Common logarithms of circular functions*—Continued

14°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.38 368		9.39 677		0.60 323	9.98 690		60	
1	9.38 418	50	9.39 731	54	0.60 269	9.98 687	3	59	
2	9.38 469	51	9.39 785	54	0.60 215	9.98 684	3	58	
3	9.38 519	50	9.39 838	53	0.60 162	9.98 681	3	57	54 53
4	9.38 570	51	9.39 892	54	0.60 108	9.98 678	3	56	1 5.4 5.3
		50		53			3		2 10.8 10.6
5	9.38 620		9.39 945		0.60 055	9.98 675		55	3 16.2 15.9
6	9.38 670	50	9.39 999	54	0.60 001	9.98 671	4	54	4 21.6 21.2
7	9 38 721	51	9.40 052	53	0.59 948	9.98 668	3	53	5 27.0 26.5
8	9.38 771	50	9.40 106	54	0.59 894	9.98 665	3	52	6 32.4 31.8
9	9.38 821	50	9.40 159	53	0.59 841	9.98 662	3	51	7 37.8 37.1
		50		53			3		8 43.2 42.4
10	9.38 871		9.40 212		0.59 788	9.98 659		50	9 48.6 47.7
11	9.38 921	50	9.40 266	54	0.59 734	9.98 656	3	49	
12	9.38 971	50	9.40 319	53	0.59 681	9.98 652	4	48	
13	9.39 021	50	9.40 372	53	0.59 628	9.98 649	3	47	
14	9.39 071	50	9.40 425	53	0.59 575	9.98 646	3	46	
		50		53			3		52 51
15	9.39 121		9.40 478		0.59 522	9.98 643		45	
16	9.39 170	49	9.40 531	53	0.59 469	9.98 640	3	44	1 5.2 5.1
17	9.39 220	50	9.40 584	53	0.59 416	9.98 636	4	43	2 10.4 10.2
18	9.39 270	50	9.40 636	52	0.59 364	9.98 633	3	42	3 15.6 15.3
19	9.39 319	49	9.40 689	53	0.59 311	9.98 630	3	41	4 20.8 20.4
		50		53			3		5 26.0 25.5
20	9.39 369		9.40 742		0.59 258	9.98 627		40	6 31.2 30.6
21	9.39 418	49	9.40 795	53	0.59 205	9.98 623	4	39	7 36.4 35.7
22	9.39 467	49	9.40 847	52	0.59 153	9.98 620	3	38	8 41.6 40.8
23	9.39 517	50	9.40 900	53	0.59 100	9.98 617	3	37	9 46.8 45.9
24	9.39 566	49	9.40 952	52	0.59 048	9.98 614	3	36	
		49		53			4		
25	9.39 615		9.41 005		0.58 995	9.98 610		35	
26	9.39 664	49	9.41 057	52	0.58 943	9.98 607	3	34	
27	9.39 713	49	9.41 109	52	0.58 891	9.98 604	3	33	50 49
28	9.39 762	49	9.41 161	52	0.58 839	9.98 601	3	32	1 5.0 4.9
29	9.39 811	49	9.41 214	53	0.58 786	9.98 597	4	31	2 10.0 9.8
		49		52			3		3 15.0 14.7
30	9.39 860		9.41 266		0.58 734	9.98 594		30	4 20.0 19.6
31	9.39 909	49	9.41 318	52	0.58 682	9.98 591	3	29	5 25.0 24.5
32	9.39 958	48	9.41 370	52	0.58 630	9.98 588	3	28	6 30.0 29.4
33	9.40 006	49	9.41 422	52	0.58 578	9.98 584	4	27	7 35.0 34.3
34	9.40 055	48	9.41 474	52	0.58 526	9.98 581	3	26	8 40.0 39.2
		49		52			3		9 45.0 44.1
35	9.40 103		9.41 526		0.58 474	9.98 578		25	
36	9.40 152	48	9.41 578	51	0.58 422	9.98 574	4	24	
37	9.40 200	49	9.41 629	52	0.58 371	9.98 571	3	23	
38	9.40 249	48	9.41 681	52	0.58 319	9.98 568	3	22	
39	9.40 297	49	9.41 733	51	0.58 267	9.98 565	3	21	48 47
		48		52			4		1 4.8 4.7
40	9.40 346		9.41 784		0.58 216	9.98 561		20	2 9.6 9.4
41	9.40 394	48	9.41 836	51	0.58 164	9.98 558	3	19	3 14.4 14.1
42	9.40 442	48	9.41 887	52	0.58 113	9.98 555	3	18	4 19.2 18.8
43	9.40 490	48	9.41 939	51	0.58 061	9.98 551	4	17	5 24.0 23.5
44	9.40 538	48	9.41 990	51	0.58 010	9.98 548	3	16	6 28.8 28.2
		48		51			3		7 33.6 32.9
45	9.40 586		9.42 041		0.57 959	9.98 545		15	8 38.4 37.6
46	9.40 634	48	9.42 093	52	0.57 907	9.98 541	4	14	9 43.2 42.3
47	9.40 682	48	9.42 144	51	0.57 856	9.98 538	3	13	
48	9.40 730	48	9.42 195	51	0.57 805	9.98 535	3	12	
49	9.40 778	48	9.42 246	51	0.57 754	9.98 531	4	11	
		47		51			3		
50	9.40 825		9.42 297		0.57 703	9.98 528		10	4 3
51	9.40 873	48	9.42 348	51	0.57 652	9.98 525	3	9	1 0.4 0.3
52	9.40 921	48	9.42 399	51	0.57 601	9.98 521	4	8	2 0.8 0.6
53	9.40 968	47	9.42 450	51	0.57 550	9.98 518	3	7	3 1.2 0.9
54	9.41 016	48	9.42 501	51	0.57 499	9.98 515	3	6	4 1.6 1.2
		47		51			4		5 2.0 1.5
55	9.41 063		9.42 552		0.57 448	9.98 511		5	6 2.4 1.8
56	9.41 111	48	9.42 603	51	0.57 397	9.98 508	3	4	7 2.8 2.1
57	9.41 158	47	9.42 653	50	0.57 347	9.98 505	3	3	8 3.2 2.4
58	9.41 205	47	9.42 704	51	0.57 296	9.98 501	4	2	9 3.6 2.7
59	9.41 252	47	9.42 755	51	0.57 245	9.98 498	3	1	
		48		50			4		
60	9.41 300		9.42 805		0.57 195	9.98 494		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
				15°					
0	9.41 300	47	9.42 805	51	0.57 195	9.98 494	3	60	
1	9.41 347	47	9.42 856	50	0.57 144	9.98 491	3	59	
2	9.41 394	47	9.42 906	51	0.57 094	9.98 488	4	58	
3	9.41 441	47	9.42 957	50	0.57 043	9.98 484	3	57	
4	9.41 488	47	9.43 007	50	0.56 993	9.98 481	4	56	51 50
5	9.41 535	47	9.43 057	51	0.56 943	9.98 477	3	55	1 5.1 5.0
6	9.41 582	46	9.43 108	50	0.56 892	9.98 474	3	54	2 10.2 10.0
7	9.41 628	47	9.43 158	50	0.56 842	9.98 471	4	53	3 15.3 15.0
8	9.41 675	47	9.43 208	50	0.56 792	9.98 467	3	52	4 20.4 20.0
9	9.41 722	46	9.43 258	50	0.56 742	9.98 464	4	51	5 25.5 25.0
10	9.41 768	47	9.43 308	50	0.56 692	9.98 460	3	50	6 30.6 30.0
11	9.41 815	46	9.43 358	50	0.56 642	9.98 457	4	49	7 35.7 35.0
12	9.41 861	47	9.43 408	50	0.56 592	9.98 453	3	48	8 40.8 40.0
13	9.41 908	46	9.43 458	50	0.56 542	9.98 450	3	47	9 45.9 45.0
14	9.41 954	47	9.43 508	50	0.56 492	9.98 447	4	46	
15	9.42 001	46	9.43 558	49	0.56 442	9.98 443	3	45	49 48
16	9.42 047	46	9.43 607	50	0.56 393	9.98 440	4	44	1 4.9 4.8
17	9.42 093	47	9.43 657	50	0.56 343	9.98 436	3	43	2 9.8 9.6
18	9.42 140	46	9.43 707	49	0.56 293	9.98 433	4	42	3 14.7 14.4
19	9.42 186	46	9.43 756	50	0.56 244	9.98 429	3	41	4 19.6 19.2
20	9.42 232	46	9.43 806	49	0.56 194	9.98 426	4	40	5 24.5 24.0
21	9.42 278	46	9.43 855	50	0.56 145	9.98 422	3	39	6 29.4 28.8
22	9.42 324	46	9.43 905	49	0.56 095	9.98 419	4	38	7 34.3 33.6
23	9.42 370	46	9.43 954	50	0.56 046	9.98 415	3	37	8 39.2 38.4
24	9.42 416	45	9.44 004	49	0.55 996	9.98 412	3	36	9 44.1 43.2
25	9.42 461	46	9.44 053	49	0.55 947	9.98 409	4	35	
26	9.42 507	46	9.44 102	49	0.55 898	9.98 405	3	34	47 46
27	9.42 553	46	9.44 151	50	0.55 849	9.98 402	4	33	1 4.7 4.6
28	9.42 599	45	9.44 201	49	0.55 799	9.98 398	3	32	2 9.4 9.2
29	9.42 644	46	9.44 250	49	0.55 750	9.98 395	4	31	3 14.1 13.8
30	9.42 690	45	9.44 299	49	0.55 701	9.98 391	3	30	4 18.8 18.4
31	9.42 735	46	9.44 348	49	0.55 652	9.98 388	4	29	5 23.5 23.0
32	9.42 781	45	9.44 397	49	0.55 603	9.98 384	3	28	6 28.2 27.6
33	9.42 826	46	9.44 446	49	0.55 554	9.98 381	4	27	7 32.9 32.2
34	9.42 872	45	9.44 495	49	0.55 505	9.98 377	4	26	8 37.6 36.8
35	9.42 917	45	9.44 544	48	0.55 456	9.98 373	3	25	9 42.3 41.4
36	9.42 962	46	9.44 592	49	0.55 408	9.98 370	4	24	
37	9.43 008	45	9.44 641	49	0.55 359	9.98 366	3	23	
38	9.43 053	45	9.44 690	48	0.55 310	9.98 363	4	22	
39	9.43 098	45	9.44 738	49	0.55 262	9.98 359	3	21	45 44
40	9.43 143	45	9.44 787	49	0.55 213	9.98 356	4	20	1 4.5 4.4
41	9.43 188	45	9.44 836	48	0.55 164	9.98 352	3	19	2 9.0 8.8
42	9.43 233	45	9.44 884	49	0.55 116	9.98 349	4	18	3 13.5 13.2
43	9.43 278	45	9.44 933	48	0.55 067	9.98 345	3	17	4 18.0 17.6
44	9.43 323	44	9.44 981	48	0.55 019	9.98 342	4	16	5 22.5 22.0
45	9.43 367	45	9.45 029	49	0.54 971	9.98 338	4	15	6 27.0 26.4
46	9.43 412	45	9.45 078	48	0.54 922	9.98 3 4	3	14	7 31.5 30.8
47	9.43 457	45	9.45 126	48	0.54 874	9.98 331	4	13	8 36.0 35.2
48	9.43 502	44	9.45 174	48	0.54 826	9.98 327	3	12	9 40.5 39.6
49	9.43 546	45	9.45 222	49	0.54 778	9.98 324	4	11	
50	9.43 591	44	9.45 271	48	0.54 729	9.98 320	3	10	4 3
51	9.43 635	45	9.45 319	48	0.54 681	9.98 317	4	9	1 0.4 0.3
52	9.43 680	44	9.45 367	48	0.54 633	9.98 313	4	8	2 0.8 0.6
53	9.43 724	45	9.45 415	48	0.54 585	9.98 309	3	7	3 1.2 0.9
54	9.43 769	44	9.45 463	48	0.54 537	9.98 306	4	6	4 1.6 1.2
55	9.43 813	44	9.45 511	48	0.54 489	9.98 302	3	5	5 2.0 1.5
56	9.43 857	44	9.45 559	47	0.54 441	9.98 299	4	4	6 2.4 1.8
57	9.43 901	45	9.45 606	48	0.54 394	9.98 295	4	3	7 2.8 2.1
58	9.43 946	44	9.45 654	48	0.54 346	9.98 291	3	2	8 3.2 2.4
59	9.43 990	44	9.45 702	48	0.54 298	9.98 288	4	1	9 3.6 2.7
60	9.44 034		9.45 750		0.54 250	9.98 284		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
				74°					

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TABLE II.—*Common logarithms of circular functions*—Continued

16°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.44 034		9.45 750		0.54 250	9.98 284		60	
1	9.44 078	44	9.45 797	47	0.54 203	9.98 281	3	59	
2	9.44 122	44	9.45 845	48	0.54 155	9.98 277	4	58	
3	9.44 166	44	9.45 892	47	0.54 108	9.98 273	4	57	
4	9.44 210	44	9.45 940	48	0.54 060	9.98 270	3	56	48 47
		43		47			4		1 4.8 4.7
5	9.44 253		9.45 987		0.54 013	9.98 266		55	2 9.6 9.4
6	9.44 297	44	9.46 035	48	0.53 965	9.98 262	4	54	3 14.4 14.1
7	9.44 341	44	9.46 082	47	0.53 918	9.98 259	3	53	4 19.2 18.8
8	9.44 385	44	9.46 130	48	0.53 870	9.98 255	4	52	5 24.0 23.5
9	9.44 428	43	9.46 177	47	0.53 823	9.98 251	4	51	6 28.8 28.2
		44		47			3		7 33.6 32.9
10	9.44 472		9.46 224		0.53 776	9.98 248		50	8 38.4 37.6
11	9.44 516	44	9.46 271	47	0.53 729	9.98 244	4	49	9 43.2 42.3
12	9.44 559	43	9.46 319	48	0.53 681	9.98 240	4	48	
13	9.44 602	43	9.46 366	47	0.53 634	9.98 237	3	47	
14	9.44 646	44	9.46 413	47	0.53 587	9.98 233	4	46	
		43		47			4		
15	9.44 689		9.46 460		0.53 540	9.98 229		45	46 45
16	9.44 733	44	9.46 507	47	0.53 493	9.98 226	3	44	1 4.6 4.5
17	9.44 776	43	9.46 554	47	0.53 446	9.98 222	4	43	2 9.2 9.0
18	9.44 819	43	9.46 601	47	0.53 399	9.98 218	4	42	3 13.8 13.5
19	9.44 862	43	9.46 648	47	0.53 352	9.98 215	3	41	4 18.4 18.0
		43		46			4		5 23.0 22.5
20	9.44 905		9.46 694		0.53 306	9.98 211		40	6 27.6 27.0
21	9.44 948	43	9.46 741	47	0.53 259	9.98 207	4	39	7 32.2 31.5
22	9.44 992	44	9.46 788	47	0.53 212	9.98 204	3	38	8 36.8 36.0
23	9.45 035	43	9.46 835	47	0.53 165	9.98 200	4	37	9 41.4 40.5
24	9.45 077	42	9.46 881	46	0.53 119	9.98 196	4	36	
		43		47			4		
25	9.45 120		9.46 928		0.53 072	9.98 192		35	
26	9.45 163	43	9.46 975	47	0.53 025	9.98 189	3	34	
27	9.45 206	43	9.47 021	46	0.52 979	9.98 185	4	33	
28	9.45 249	43	9.47 068	47	0.52 932	9.98 181	4	32	44 43
29	9.45 292	43	9.47 114	46	0.52 886	9.98 177	4	31	1 4.4 4.3
		42		46			3		2 8.8 8.6
30	9.45 334		9.47 160		0.52 840	9.98 174		30	3 13.2 12.9
31	9.45 377	43	9.47 207	47	0.52 793	9.98 170	4	29	4 17.6 17.2
32	9.45 419	42	9.47 253	46	0.52 747	9.98 166	4	28	5 22.0 21.5
33	9.45 462	43	9.47 299	46	0.52 701	9.98 162	4	27	6 26.4 25.8
34	9.45 504	42	9.47 346	47	0.52 654	9.98 159	3	26	7 30.8 30.1
		43		46			4		8 35.2 34.4
35	9.45 547		9.47 392		0.52 608	9.98 155		25	9 39.6 38.7
36	9.45 589	42	9.47 438	46	0.52 562	9.98 151	4	24	
37	9.45 632	43	9.47 484	46	0.52 516	9.98 147	4	23	
38	9.45 674	42	9.47 530	46	0.52 470	9.98 144	3	22	
39	9.45 716	42	9.47 576	46	0.52 424	9.98 140	4	21	42 41
		42		46			4		1 4.2 4.1
40	9.45 758		9.47 622		0.52 378	9.98 136		20	2 8.4 8.2
41	9.45 801	43	9.47 668	46	0.52 332	9.98 132	4	19	3 12.6 12.3
42	9.45 843	42	9.47 714	46	0 52 286	9.98 129	3	18	4 16.8 16.4
43	9.45 885	42	9.47 760	46	0.52 240	9.98 125	4	17	5 21.0 20.5
44	9.45 927	42	9.47 806	46	0.52 194	9.98 121	4	16	6 25.2 24.6
		42		46			4		7 29.4 28.7
45	9.45 969		9.47 852		0.52 148	9.98 117		15	8 33.6 32.8
46	9.46 011	42	9.47 897	45	0.52 103	9.98 113	4	14	9 37.8 36.9
47	9.46 053	42	9.47 943	46	0.52 057	9.98 110	3	13	
48	9.46 095	42	9.47 989	46	0.52 011	9.98 106	4	12	
49	9.46 136	41	9.48 035	46	0.51 965	9.98 102	4	11	
		42		45			4		4 3
50	9 46 178		9.48 080		0.51 920	9.98 098		10	
51	9.46 220	42	9.48 126	46	0.51 874	9.98 094	4	9	1 0.4 0.3
52	9.46 262	42	9.48 171	45	0.51 829	9.98 090	4	8	2 0.8 0.6
53	9.46 303	41	9.48 217	46	0.51 783	9.98 087	3	7	3 1.2 0.9
54	9.46 345	42	9.48 262	45	0.51 738	9.98 083	4	6	4 1.6 1.2
		41		45			4		5 2.0 1.5
55	9.46 386		9.48 307		0.51 693	9.98 079		5	6 2.4 1.8
56	9.46 428	42	9.48 353	46	0.51 647	9.98 075	4	4	7 2.8 2.1
57	9.46 469	41	9.48 398	45	0.51 602	9.98 071	4	3	8 3.2 2.4
58	9.46 511	42	9.48 443	45	0.51 557	9.98 067	4	2	9 3.6 2.7
59	9.46 552	41	9.48 489	46	0.51 511	9.98 063	4	1	
		42		45			3		
60	9.46 594		9.48 534		0.51 466	9.98 060		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
			17°						
0	9.46 594		9.48 534		0.51 466	9.98 060		60	
1	9.46 635	41	9.48 579	45	0.51 421	9.98 056	4	59	
2	9.46 676	41	9.48 624	45	0.51 376	9.98 052	4	58	
3	9.46 717	41	9.48 669	45	0.51 331	9.98 048	4	57	
4	9.46 758	41	9.48 714	45	0.51 286	9.98 044	4	56	45 44
5	9.46 800	42	9.48 759		0.51 241	9.98 040	4	55	1 4.5 4.4
6	9.46 841	41	9.48 804	45	0.51 196	9.98 036	4	54	2 9.0 8.8
7	9.46 882	41	9.48 849	45	0.51 151	9.98 032	4	53	3 13.5 13.2
8	9.46 923	41	9.48 894	45	0.51 106	9.98 029	3	52	4 18.0 17.6
9	9.46 964	41	9.48 939	45	0.51 061	9.98 025	4	51	5 22.5 22.0
10	9.47 005	41	9.48 984	45	0.51 016	9.98 021	4	50	6 27.0 26.4
11	9.47 045	40	9.49 029	44	0.50 971	9.98 017	4	49	7 31.5 30.8
12	9.47 086	41	9.49 073	45	0.50 927	9.98 013	4	48	8 36.0 35.2
13	9.47 127	41	9.49 118	45	0.50 882	9.98 009	4	47	9 40.5 39.6
14	9.47 168	41	9.49 163	44	0.50 837	9.98 005	4	46	
15	9.47 209	41	9.49 207	45	0.50 793	9.98 001	4	45	43 42
16	9.47 249	40	9.49 252	44	0.50 748	9.97 997	4	44	1 4.3 4.2
17	9.47 290	41	9.49 296	45	0.50 704	9.97 993	4	43	2 8.6 8.4
18	9.47 330	40	9.49.341	44	0.50 659	9.97 989	4	42	3 12.9 12.6
19	9.47 371	41	9.49 385	45	0.50 615	9.97 986	3	41	4 17.2 16.8
20	9.47 411	40	9.49 430		0.50 570	9.97 982	4	40	5 21.5 21.0
21	9.47 452	41	9.49 474	44	0.50 526	9.97 978	4	39	6 25.8 25.2
22	9.47 492	40	9.49 519	45	0.50 481	9.97 974	4	38	7 30.1 29.4
23	9.47 533	41	9.49 563	44	0.50 437	9.97 970	4	37	8 34.4 33.6
24	9.47 573	40	9.49 607	44	0.50 393	9.97 966	4	36	9 38.7 37.8
25	9.47 613	40	9.49 652	45	0.50 348	9.97 962	4	35	
26	9.47 654	41	9.49 696	44	0.50 304	9.97 958	4	34	
27	9.47 694	40	9.49 740	44	0.50 260	9.97 954	4	33	41 40
28	9.47 734	40	9.49 784	44	0.50 216	9.97 950	4	32	1 4.1 4.0
29	9.47 774	40	9.49 828	44	0.50 172	9.97 946	4	31	2 8.2 8.0
30	9.47 814	40	9.49 872		0.50 128	9.97 942	4	30	3 12.3 12.0
31	9.47 854	40	9.49 916	44	0.50 084	9.97 938	4	29	4 16.4 16.0
32	9.47 894	40	9.49 960	44	0.50 040	9.97 934	4	28	5 20.5 20.0
33	9.47 934	40	9.50 004	44	0.49 996	9.97 930	4	27	6 24.6 24.0
34	9.47 974	40	9.50 048	44	0.49 952	9.97 926	4	26	7 28.7 28.0
35	9.48 014	40	9.50 092	44	0.49 908	9.97 922	4	25	8 32.8 32.0
36	9.48 054	40	9.50 136	44	0.49 864	9.97 918	4	24	9 36.9 36.0
37	9.48 094	39	9.50 180	43	0.49 820	9.97 914	4	23	
38	9.48 133	40	9.50 223	44	0.49 777	9.97 910	4	22	
39	9.48 173	40	9.50 267	44	0.49 733	9.97 906	4	21	39 5
40	9.48 213	39	9.50 311	44	0.49 689	9.97 902	4	20	1 3.9 0.5
41	9.48 252	40	9.50 355	43	0.49 645	9.97 898	4	19	2 7.8 1.0
42	9.48 292	40	9.50 398	44	0.49 602	9.97 894	4	18	3 11.7 1.5
43	9.48 332	39	9.50 442	43	0.49 558	9.97 890	4	17	4 15.6 2.0
44	9.48 371	40	9.50 485	44	0.49 515	9.97 886	4	16	5 19.5 2.5
45	9.48 411	39	9.50 529	43	0.49 471	9.97 882	4	15	6 23.4 3.0
46	9.48 450	40	9.50 572	44	0.49 428	9.97 878	4	14	7 27.3 3.5
47	9.48 490	39	9.50 616	43	0.49 384	9.97 874	4	13	8 31.2 4.0
48	9.48 529	39	9.50 659	44	0.49 341	9.97 870	4	12	9 35.1 4.5
49	9.48 568	39	9.50 703	43	0.49 297	9.97 866	5	11	
50	9.48 607	40	9.50 746	43	0.49 254	9.97 861	4	10	4 3
51	9.48 647	39	9.50 789	44	0.49 211	9.97 857	4	9	1 0.4 0.3
52	9.48 686	39	9.50 833	43	0.49 167	9.97 853	4	8	2 0.8 0.6
53	9.48 725	39	9.50 876	43	0.49 124	9.97 849	4	7	3 1.2 0.9
54	9.48 764	39	9.50 919	43	0.49 081	9.97 845	4	6	4 1.6 1.2
55	9.48 803	39	9.50 962	43	0.49 038	9.97 841	4	5	5 2.0 1.5
56	9.48 842	39	9.51 005	43	0.48 995	9.97 837	4	4	6 2.4 1.8
57	9.48 881	39	9.51 048	44	0.48 952	9.97 833	4	3	7 2.8 2.1
58	9.48 920	39	9.51 092	43	0.48 908	9.97 829	4	2	8 3.2 2.4
59	9.48 959	39	9.51 135	43	0.48 865	9.97 825	4	1	9 3.6 2.7
60	9.48 998		9.51 178		0.48 822	9.97 821		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
			72°						

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TABLE II.—*Common logarithms of circular functions*—Continued

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′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.48 998		9.51 178		0.48 822	9.97 821		60	
1	9.49 037	39	9.51 221	43	0.48 779	9.97 817	4	59	
2	9.49 076	39	9.51 264	43	0.48 736	9.97 812	5	58	43 42
3	9.49 115	39	9.51 306	42	0.48 694	9.97 808	4	57	1 4.3 4.2
4	9.49 153	38	9.51 349	43	0.48 651	9.97 804	4	56	2 8.6 8.4
		39		43			4		3 12.9 12.6
5	9.49 192		9.51 392		0.48 608	9.97 800		55	4 17.2 16.8
6	9.49 231	39	9.51 435	43	0.48 565	9.97 796	4	54	5 21.5 21.0
7	9.49 269	38	9.51 478	43	0.48 522	9.97 792	4	53	6 25.8 25.2
8	9.49 308	39	9.51 520	42	0.48 480	9.97 788	4	52	7 30.1 29.4
9	9.49 347	39	9.51 563	43	0.48 437	9.97 784	4	51	8 34.4 33.6
		38		43			5		9 38.7 37.8
10	9.49 385		9.51 606		0.48 394	9.97 779		50	
11	9.49 424	39	9.51 648	42	0.48 352	9.97 775	4	49	
12	9.49 462	38	9.51 691	43	0.48 309	9.97 771	4	48	
13	9.49 500	38	9.51 734	43	0.48 266	9.97 767	4	47	41
14	9.49 539	39	9.51 776	42	0.48 224	9.97 763	4	46	1 4.1
		38		43			4		2 8.2
15	9.49 577		9.51 819		0.48 181	9.97 759		45	3 12.3
16	9.49 615	38	9.51 861	42	0.48 139	9.97 754	5	44	4 16.4
17	9.49 654	39	9.51 903	42	0.48 097	9.97 750	4	43	5 20.5
18	9.49 692	38	9.51 946	43	0.48 054	9.97 746	4	42	6 24.6
19	9.49 730	38	9.51 988	42	0.48 012	9.97 742	4	41	7 28.7
		38		43			4		8 32.8
20	9.49 768		9.52 031		0.47 969	9.97 738		40	9 36.9
21	9.49 806	38	9.52 073	42	0.47 927	9.97 734	4	39	
22	9.49 844	38	9.52 115	42	0.47 885	9.97 729	5	38	
23	9.49 882	38	9.52 157	42	0.47 843	9.97 725	4	37	
24	9.49 920	38	9.52 200	43	0.47 800	9.97 721	4	36	
		38		42			4		39 38
25	9.49 958		9.52 242		0.47 758	9.97 717		35	1 3.9 3.8
26	9.49 996	38	9.52 284	42	0.47 716	9.97 713	4	34	2 7.8 7.6
27	9.50 034	38	9.52 326	42	0.47 674	9.97 708	5	33	3 11.7 11.4
28	9.50 072	38	9.52 368	42	0.47 632	9.97 704	4	32	4 15.6 15.2
29	9.50 110	38	9.52 410	42	0.47 590	9.97 700	4	31	5 19.5 19.0
		38		42			4		6 23.4 22.8
30	9.50 148		9.52 452		0.47 548	9.97 696		30	7 27.3 26.6
31	9.50 185	37	9.52 494	42	0.47 506	9.97 691	5	29	8 31.2 30.4
32	9.50 223	38	9.52 536	42	0.47 464	9.97 687	4	28	9 35.1 34.2
33	9.50 261	38	9.52 578	42	0.47 422	9.97 683	4	27	
34	9.50 298	37	9.52 620	42	0.47 380	9.97 679	4	26	
		38		41			5		
35	9.50 336		9.52 661		0.47 339	9.97 674		25	
36	9.50 374	38	9.52 703	42	0.47 297	9.97 670	4	24	
37	9.50 411	37	9.52 745	42	0.47 255	9.97 666	4	23	37 36
38	9.50 449	38	9.52 787	42	0.47 213	9.97 662	4	22	1 3.7 3.6
39	9.50 486	37	9.52 829	42	0.47 171	9.97 657	5	21	2 7.4 7.2
		37		41			4		3 11.1 10.8
40	9.50 523		9.52 870		0.47 130	9.97 653		20	4 14.8 14.4
41	9.50 561	38	9.52 912	42	0.47 088	9.97 649	4	19	5 18.5 18.0
42	9.50 598	37	9.52 953	41	0.47 047	9.97 645	4	18	6 22.2 21.6
43	9.50 635	37	9.52 995	42	0.47 005	9.97 640	5	17	7 25.9 25.2
44	9.50 673	38	9.53 037	42	0.46 963	9.97 636	4	16	8 29.6 28.8
		37		41			4		9 33.3 32.4
45	9.50 710		9.53 078		0.46 922	9.97 632		15	
46	9.50 747	37	9.53 120	42	0.46 880	9.97 628	4	14	
47	9.50 784	37	9.53 161	41	0.46 839	9.97 623	5	13	
48	9.50 821	37	9.53 202	41	0.46 798	9.97 619	4	12	
49	9.50 858	37	9.53 244	42	0.46 756	9.97 615	4	11	
		38		41			5		5 4
50	9.50 896		9.53 285		0.46 715	9.97 610		10	1 0.5 0.4
51	9.50 933	37	9.53 327	42	0.46 673	9.97 606	4	9	2 1.0 0.8
52	9.50 970	37	9.53 368	41	0.46 632	9.97 602	4	8	3 1.5 1.2
53	9.51 007	37	9.53 409	41	0.46 591	9.97 597	5	7	4 2.0 1.6
54	9.51 043	36	9.53 450	41	0.46 550	9.97 593	4	6	5 2.5 2.0
		37		42			4		6 3.0 2.4
55	9.51 080		9.53 492		0.46 508	9.97 589		5	7 3.5 2.8
56	9.51 117	37	9.53 533	41	0.46 467	9.97 584	5	4	8 4.0 3.2
57	9.51 154	37	9.53 574	41	0.46 426	9.97 580	4	3	9 4.5 3.6
58	9.51 191	37	9.53 615	41	0.46 385	9.97 576	4	2	
59	9.51 227	36	9.53 656	41	0.46 344	9.97 571	5	1	
		37		41			4		
60	9.51 264		9.53 697		0.46 303	9.97 567		0	
	L. Cos.	d.	L. Cot.	c.d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

19°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.51 264		9.53 697		0.46 303	9.97 567		60	
1	9.51 301	37	9.53 738	41	0.46 262	9.97 563	4	59	
2	9.51 338	37	9.53 779	41	0.46 221	9.97 558	5	58	
3	9.51 374	36	9.53 820	41	0.46 180	9.97 554	4	57	41 40
4	9.51 411	37	9.53 861	41	0.46 139	9.97 550	4	56	1 4.1 4.0
		36		41			5		2 8.2 8.0
5	9.51 447		9.53 902		0.46 098	9.97 545		55	3 12.3 12.0
6	9.51 484	37	9.53 943	41	0.46 057	9.97 541	4	54	4 16.4 16.0
7	9.51 520	36	9.53 984	41	0.46 016	9.97 536	5	53	5 20.5 20.0
8	9.51 557	37	9.54 025	41	0.45 975	9.97 532	4	52	6 24.6 24.0
9	9.51 593	36	9.54 065	40	0.45 935	9.97 528	4	51	7 28.7 28.0
		36		41			5		8 32.8 32.0
10	9.51 629		9.54 106		0.45 894	9.97 523		50	9 36.9 36.0
11	9.51 666	37	9.54 147	41	0.45 853	9.97 519	4	49	
12	9.51 702	36	9.54 187	40	0.45 813	9.97 515	4	48	
13	9.51 738	36	9.54 228	41	0.45 772	9.97 510	5	47	
14	9.51 774	36	9.54 269	41	0.45 731	9.97 506	4	46	
		37		40			5		39
15	9.51 811		9.54 309		0.45 691	9.97 501		45	1 3.9
16	9.51 847	36	9.54 350	41	0.45 650	9.97 497	4	44	2 7.8
17	9.51 883	36	9.54 390	40	0.45 610	9.97 492	5	43	3 11.7
18	9.51 919	36	9.54 431	41	0.45 569	9.97 488	4	42	4 15.6
19	9.51 955	36	9.54 471	40	0.45 529	9.97 484	4	41	5 19.5
		36		41			5		6 23.4
20	9.51 991		9.54 512		0.45 488	9.97 479		40	7 27.3
21	9.52 027	36	9.54 552	40	0.45 448	9.97 475	4	39	8 31.2
22	9.52 063	36	9.54 593	41	0.45 407	9.97 470	5	38	9 35.1
23	9.52 099	36	9.54 633	40	0.45 367	9.97 466	4	37	
24	9.52 135	36	9.54 673	40	0.45 327	9.97 461	5	36	
		36		41			4		
25	9.52 171		9.54 714		0.45 286	9.97 457		35	37 36
26	9.52 207	36	9.54 754	40	0.45 246	9.97 453	4	34	
27	9.52 242	35	9.54 794	40	0.45 206	9.97 448	5	33	1 3.7 3.6
28	9.52 278	36	9.54 835	41	0.45 165	9.97 444	4	32	2 7.4 7.2
29	9.52 314	36	9.54 875	40	0.45 125	9.97 439	5	31	3 11.1 10.8
		36		40			4		4 14.8 14.4
30	9.52 350		9.54 915		0.45 085	9.97 435		30	5 18.5 18.0
31	9.52 385	35	9.54 955	40	0.45 045	9.97 430	5	29	6 22.2 21.6
32	9.52 421	36	9.54 995	40	0.45 005	9.97 426	4	28	7 25.9 25.2
33	9.52 456	35	9.55 035	40	0.44 965	9.97 421	5	27	8 29.6 28.8
34	9.52 492	36	9.55 075	40	0.44 925	9.97 417	4	26	9 33.3 32.4
		35		40			5		
35	9.52 527		9.55 115		0.44 885	9.97 412		25	
36	9.52 563	36	9.55 155	40	0.44 845	9.97 408	4	24	
37	9.52 598	35	9.55 195	40	0.44 805	9.97 403	5	23	
38	9.52 634	36	9.55 235	40	0.44 765	9.97 399	4	22	35 34
39	9.52 669	35	9.55 275	40	0.44 725	9.97 394	5	21	1 3.5 3.4
		36		40			4		2 7.0 6.8
40	9.52 705		9.55 315		0.44 685	9.97 390		20	3 10.5 10.2
41	9.52 740	35	9.55 355	40	0.44 645	9.97 385	5	19	4 14.0 13.6
42	9.52 775	35	9.55 395	40	0.44 605	9.97 381	4	18	5 17.5 17.0
43	9.52 811	36	9.55 434	39	0.44 566	9.97 376	5	17	6 21.0 20.4
44	9.52 846	35	9.55 474	40	0.44 526	9.97 372	4	16	7 24.5 23.8
		35		40			5		8 28.0 27.2
45	9.52 881		9.55 514		0.44 486	9.97 367		15	9 31.5 30.6
46	9.52 916	35	9.55 554	40	0.44 446	9.97 363	4	14	
47	9.52 951	35	9.55 593	39	0.44 407	9.97 358	5	13	
48	9.52 986	35	9.55 633	40	0.44 367	9.97 353	5	12	
49	9.53 021	35	9.55 673	40	0.44 327	9.97 349	4	11	
		35		39			5		5 4
50	9.53 056		9.55 712		0.44 288	9.97 344		10	1 0.5 0.4
51	9.53 092	36	9.55 752	40	0.44 248	9.97 340	4	9	2 1.0 0.8
52	9.53 126	34	9.55 791	39	0.44 209	9.97 335	5	8	3 1.5 1.2
53	9.53 161	35	9.55 831	40	0.44 169	9.97 331	4	7	4 2.0 1.6
54	9.53 196	35	9.55 870	39	0.44 130	9.97 326	5	6	5 2.5 2.0
		35		40			4		6 3.0 2.4
55	9.53 231		9.55 910		0.44 090	9.97 322		5	7 3.5 2.8
56	9.53 266	35	9.55 949	39	0.44 051	9.97 317	5	4	8 4.0 3.2
57	9.53 301	35	9.55 989	40	0.44 011	9.97 312	5	3	9 4.5 3.6
58	9.53 336	35	9.56 028	39	0.43 972	9.97 308	4	2	
59	9.53 370	34	9.56 067	39	0.43 933	9.97 303	5	1	
		35		40			4		
60	9.53 405		9.56 107		0.43 893	9.97 299		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

20°									
′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.53 405	35	9.56 107	39	0.43 893	9.97 299	5	60	
1	9.53 440	35	9.56 146	39	0.43 854	9.97 294	5	59	40 39
2	9.53 475	34	9.56 185	39	0.43 815	9.97 289	4	58	
3	9.53 509	35	9.56 224	40	0.43 776	9.97 285	5	57	1 4.0 3.9
4	9.53 544	34	9.56 264	39	0.43 736	9.97 280	4	56	2 8.0 7.8
5	9.53 578	35	9.56 303	39	0.43 697	9.97 276	5	55	3 12.0 11.7
6	9.53 613	34	9.56 342	39	0.43 658	9.97 271	5	54	4 16.0 15.6
7	9.53 647	35	9.56 381	39	0.43 619	9.97 266	4	53	5 20.0 19.5
8	9.53 682	34	9.56 420	39	0.43 580	9.97 262	5	52	6 24.0 23.4
9	9.53 716	35	9.56 459	39	0.43 541	9.97 257	5	51	7 28.0 27.3
10	9.53 751	34	9.56 498	39	0.43 502	9.97 252	4	50	8 32.0 31.2
11	9.53 785	34	9.56 537	39	0.43 463	9.97 248	5	49	9 36.0 35.1
12	9.53 819	35	9.56 576	39	0.43 424	9.97 243	5	48	
13	9.53 854	34	9.56 615	39	0.43 385	9.97 238	4	47	38 37
14	9.53 888	34	9.56 654	39	0.43 346	9.97 234	5	46	1 3.8 3.7
15	9.53 922	35	9.56 693	39	0.43 307	9.97 229	5	45	2 7.6 7.4
16	9.53 957	34	9.56 732	39	0.43 268	9.97 224	4	44	3 11.4 11.1
17	9.53 991	34	9.56 771	39	0.43 229	9.97 220	5	43	4 15.2 14.8
18	9.54 025	34	9.56 810	39	0.43 190	9.97 215	5	42	5 19.0 18.5
19	9.54 059	34	9.56 849	38	0.43 151	9.97 210	5	41	6 22.8 22.2
20	9.54 093	34	9.56 887	39	0.43 113	9.97 206	5	40	7 26.6 25.9
21	9.54 127	34	9.56 926	39	0.43 074	9.97 201	5	39	8 30.4 29.6
22	9.54 161	34	9.56 965	39	0.43 035	9.97 196	4	38	9 34.2 33.3
23	9.54 195	34	9.57 004	38	0.42 996	9 97 192	5	37	
24	9.54 229	34	9.57 042	39	0.42 958	9.97 187	5	36	35
25	9.54 263	34	9.57 081	39	0.42 919	9.97 182	4	35	1 3.5
26	9.54 297	34	9.57 120	38	0.42 880	9.97 178	5	34	2 7.0
27	9.54 331	34	9.57 158	39	0.42 842	9.97 173	5	33	3 10.5
28	9.54 365	34	9.57 197	38	0.42 803	9.97 168	5	32	4 14.0
29	9.54 399	34	9.57 235	39	0.42 765	9.97 163	4	31	5 17.5
30	9.54 433	33	9.57 274	38	0.42 726	9.97 159	5	30	6 21.0
31	9.54 466	34	9.57 312	39	0.42 688	9.97 154	5	29	7 24.5
32	9.54 500	34	9.57 351	38	0.42 649	9.97 149	4	28	8 28.0
33	9.54 534	33	9.57 389	39	0.42 611	9.97 145	5	27	9 31.5
34	9.54 567	34	9.57 428	38	0.42 572	9.97 140	5	26	
35	9.54 601	34	9.57 466	38	0.42 534	9.97 135	5	25	34 33
36	9.54 635	33	9.57 504	39	0.42 496	9.97 130	4	24	
37	9.54 668	34	9.57 543	38	0.42 457	9.97 126	5	23	1 3.4 3.3
38	9.54 702	33	9.57 581	38	0.42 419	9.97 121	5	22	2 6.8 6.6
39	9.54 735	34	9.57 619	39	0.42 381	9.97 116	5	21	3 10.2 9.9
40	9.54 769	33	9.57 658	38	0.42 342	9.97 111	4	20	4 13.6 13.2
41	9.54 802	34	9.57 696	38	0.42 304	9.97 107	5	19	5 17.0 16.5
42	9.54 836	33	9.57 734	38	0.42 266	9.97 102	5	18	6 20.4 19.8
43	9.54 869	34	9.57 772	38	0.42 228	9.97 097	5	17	7 23.8 23.1
44	9.54 903	33	9.57 810	39	0.42 190	9.97 092	5	16	8 27.2 26.4
45	9.54 936	33	9.57 849	38	0.42 151	9.97 087	4	15	9 30.6 29.7
46	9.54 969	34	9.57 887	38	0.42 113	9.97 083	5	14	
47	9.55 003	33	9.57 925	38	0.42 075	9.97 078	5	13	
48	9.55 036	33	9.57 963	38	0.42 037	9.97 073	5	12	
49	9.55 069	33	9.58 001	38	0.41 999	9.97 068	5	11	5 4
50	9.55 102	34	9.58 039	38	0.41 961	9.97 063	4	10	1 0.5 0.4
51	9.55 136	33	9.58 077	38	0.41 923	9.97 059	5	9	2 1.0 0.8
52	9.55 169	33	9.58 115	38	0.41 885	9.97 054	5	8	3 1.5 1.2
53	9.55 202	33	9.58 153	38	0.41 847	9.97 049	5	7	4 2.0 1.6
54	9.55 235	33	9.58 191	38	0.41 809	9.97 044	5	6	5 2.5 2.0
55	9.55 268	33	9.58 229	38	0.41 771	9.97 039	4	5	6 3.0 2.4
56	9.55 301	33	9.58 267	37	0.41 733	9.97 035	5	4	7 3.5 2.8
57	9.55 334	33	9.58 304	38	0.41 696	9.97 030	5	3	8 4.0 3.2
58	9.55 367	33	9.58 342	38	0.41 658	9.97 025	5	2	9 4.5 3.6
59	9.55 400	33	9.58 380	38	0.41 620	9.97 020	5	1	
60	9.55 433		9.58 418		0.41 582	9.97 015		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
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TABLE II.—*Common logarithms of circular functions*—Continued

21°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.55 433	33	9.58 418	37	0.41 582	9.97 015	5	60	
1	9.55 466	33	9.58 455	38	0.41 545	9.97 010	5	59	
2	9.55 499	33	9.58 493	38	0.41 507	9.97 005	4	58	
3	9.55 532	32	9.58 531	38	0.41 469	9.97 001	5	57	38 37
4	9.55 564	33	9.58 569	37	0.41 431	9.96 996	5	56	1 3.8 3.7
5	9.55 597	33	9.58 606	38	0.41 394	9.96 991	5	55	2 7.6 7.4
6	9.55 630	33	9.58 644	37	0.41 356	9.96 986	5	54	3 11.4 11.1
7	9.55 663	32	9.58 681	38	0.41 319	9.96 981	5	53	4 15.2 14.8
8	9.55 695	33	9.58 719	38	0.41 281	9.96 976	5	52	5 19.0 18.5
9	9.55 728	33	9.58 757	37	0.41 243	9.96 971	5	51	6 22.8 22.2
10	9.55 761	32	9.58 794	38	0.41 206	9.96 966	4	50	7 26.6 25.9
11	9.55 793	33	9.58 832	37	0.41 168	9.96 962	5	49	8 30.4 29.6
12	9.55 826	32	9.58 869	38	0.41 131	9.96 957	5	48	9 34.2 33.3
13	9.55 858	33	9.58 907	37	0.41 093	9.96 952	5	47	
14	9.55 891	32	9.58 944	37	0.41 056	9.96 947	5	46	36 33
15	9.55 923	33	9.58 981	38	0.41 019	9.96 942	5	45	1 3.6 3.3
16	9.55 956	32	9.59 019	37	0.40 981	9.96 937	5	44	2 7.2 6.6
17	9.55 988	33	9.59 056	38	0.40 944	9.96 932	5	43	3 10.8 9.9
18	9.56 021	32	9.59 094	37	0.40 906	9.96 927	5	42	4 14.4 13.2
19	9.56 053	32	9.59 131	37	0.40 869	9.96 922	5	41	5 18.0 16.5
20	9.56 085	33	9.59 168	37	0.40 832	9.96 917	5	40	6 21.6 19.8
21	9.56 118	32	9.59 205	38	0.40 795	9.96 912	5	39	7 25.2 23.1
22	9.56 150	32	9.59 243	37	0.40 757	9.96 907	4	38	8 28.8 26.4
23	9.56 182	33	9.59 280	37	0.40 720	9.96 903	5	37	9 32.4 29.7
24	9.56 215	32	9.59 317	37	0.40 683	9.96 898	5	36	
25	9.56 247	32	9.59 354	37	0.40 646	9.96 893	5	35	
26	9.56 279	32	9.59 391	38	0.40 609	9.96 888	5	34	32
27	9.56 311	32	9.59 429	37	0.40 571	9.96 883	5	33	1 3.2
28	9.56 343	32	9.59 466	37	0.40 534	9.96 878	5	32	2 6.4
29	9.56 375	33	9.59 503	37	0.40 497	9.96 873	5	31	3 9.6
30	9.56 408	32	9.59 540	37	0.40 460	9.96 868	5	30	4 12.8
31	9.56 440	32	9.59 577	37	0.40 423	9.96 863	5	29	5 16.0
32	9.56 472	32	9.59 614	37	0.40 386	9.96 858	5	28	6 19.2
33	9.56 504	32	9.59 651	37	0.40 349	9.96 853	5	27	7 22.4
34	9.56 536	32	9.59 688	37	0.40 312	9.96 848	5	26	8 25.6
35	9.56 568	31	9.59 725	37	0.40 275	9.96 843	5	25	9 28.8
36	9.56 599	32	9.59 762	37	0.40 238	9.96 838	5	24	
37	9.56 631	32	9.59 799	36	0.40 201	9.96 833	5	23	
38	9.56 663	32	9.59 835	37	0.40 165	9.96 828	5	22	31 6
39	9.56 695	32	9.59 872	37	0.40 128	9.96 823	5	21	1 3.1 0.6
40	9.56 727	32	9.59 909	37	0.40 091	9.96 818	5	20	2 6.2 1.2
41	9.56 759	31	9.59 946	37	0.40 054	9.96 813	5	19	3 9.3 1.8
42	9.56 790	32	9.59 983	36	0.40 017	9.96 808	5	18	4 12.4 2.4
43	9.56 822	32	9.60 019	37	0.39 981	9.96 803	5	17	5 15.5 3.0
44	9.56 854	32	9.60 056	37	0.39 944	9.96 798	5	16	6 18.6 3.6
45	9.56 886	31	9.60 093	37	0.39 907	9.96 793	5	15	7 21.7 4.2
46	9.56 917	32	9.60 130	36	0.39 870	9.96 788	5	14	8 24.8 4.8
47	9.56 949	31	9.60 166	37	0.39 834	9.96 783	5	13	9 27.9 5.4
48	9.56 980	32	9.60 203	37	0.39 797	9.96 778	5	12	
49	9.57 012	32	9.60 240	36	0.39 760	9.96 772	5	11	5 4
50	9.57 044	31	9.60 276	37	0.39 724	9.96 767	5	10	1 0.5 0.4
51	9.57 075	32	9.60 313	36	0.39 687	9.96 762	5	9	2 1.0 0.8
52	9.57 107	31	9.60 349	37	0.39 651	9.96 757	5	8	3 1.5 1.2
53	9.57 138	31	9.60 386	36	0.39 614	9.96 752	5	7	4 2.0 1.6
54	9.57 169	32	9.60 422	37	0.39 578	9.96 747	5	6	5 2.5 2.0
55	9.57 201	31	9.60 459	36	0.39 541	9.96 742	5	5	6 3.0 2.4
56	9.57 232	32	9.60 495	37	0.39 505	9.96 737	5	4	7 3.5 2.8
57	9.57 264	31	9.60 532	36	0.39 468	9.96 732	5	3	8 4.0 3.2
58	9.57 295	31	9.60 568	37	0.39 432	9.96 727	5	2	9 4.5 3.6
59	9.57 326	32	9.60 605	36	0.39 395	9.96 722	5	1	
60	9.57 358		9.60 641		0.39 359	9.96 717		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

22°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.57 358	31	9.60 641	36	0.39 359	9.96 717	6	60	
1	9.57 389	31	9.60 677	37	0.39 323	9.96 711	5	59	
2	9.57 420	31	9.60 714	36	0.39 286	9.96 706	5	58	37 36
3	9.57 451	31	9 60 750	36	0.39 250	9.96 701	5	57	1 3.7 3.6
4	9.57 482	32	9.60 786	37	0.39 214	9.96 696	5	56	2 7.4 7.2
									3 11.1 10.8
5	9.57 514	31	9.60 823	36	0.39 177	9.96 691	5	55	4 14.8 14.4
6	9.57 545	31	9.60 859	36	0.39 141	9.96 686	5	54	5 18.5 18.0
7	9.57 576	31	9.60 895	36	0.39 105	9.96 681	5	53	6 22.2 21.6
8	9.57 607	31	9.60 931	36	0.39 069	9.96 676	6	52	7 25.9 25.2
9	9.57 638	31	9.60 967	37	0.39 033	9.96 670	5	51	8 29.6 28.8
									9 33.3 32.4
10	9.57 669	31	9.61 004	36	0.38 996	9.96 665	5	50	
11	9.57 700	31	9.61 040	36	0.38 960	9.96 660	5	49	
12	9.57 731	31	9.61 076	36	0.38 924	9.96 655	5	48	
13	9.57 762	31	9.61 112	36	0.38 888	9.96 650	5	47	35
14	9.57 793	31	9.61 148	36	0.38 852	9.96 645	5	46	1 3.5
15	9.57 824	31	9.61 184	36	0.38 816	9.96 640	6	45	2 7.0
16	9.57 855	30	9.61 220	36	0.38 780	9.96 634	5	44	3 10.5
17	9.57 885	31	9.61 256	36	0.38 744	9.96 629	5	43	4 14.0
18	9.57 916	31	9.61 292	36	0.38 708	9.96 624	5	42	5 17.5
19	9.57 947	31	9.61 328	36	0.38 672	9.96 619	5	41	6 21.0
									7 24.5
20	9.57 978	30	9.61 364	36	0.38 636	9.96 614	6	40	8 28.0
21	9.58 008	31	9.61 400	36	0.38 600	9.96 608	5	39	9 31.5
22	9.58 039	31	9.61 436	36	0.38 564	9.96 603	5	38	
23	9.58 070	31	9.61 472	36	0.38 528	9.96 598	5	37	
24	9.58 101	30	9.61 508	36	0.38 492	9.96 593	5	36	
25	9.58 131	31	9.61 544	35	0.38 456	9.96 588	6	35	32 31
26	9.58 162	30	9.61 579	36	0.38 421	9.96 582	5	34	
27	9.58 192	31	9.61 615	36	0.38 385	9.96 577	5	33	1 3.2 3.1
28	9.58 223	30	9.61 651	36	0.38 349	9.96 572	5	32	2 6.4 6.2
29	9.58 253	31	9.61 687	35	0.38 313	9.96 567	5	31	3 9.6 9.3
									4 12.8 12.4
30	9.58 284	30	9.61 722	36	0.38 278	9.96 562	6	30	5 16.0 15.5
31	9.58 314	31	9.61 758	36	0.38 242	9.96 556	5	29	6 19.2 18.6
32	9.58 345	30	9.61 794	36	0.38 206	9.96 551	5	28	7 22.4 21.7
33	9.58 375	31	9.61 830	36	0.38 170	9.96 546	5	27	8 25.6 24.8
34	9.58 406	30	9.61 865	35	0.38 135	9.96 541	6	26	9 28.8 27.9
				36					
35	9.58 436	31	9.61 901	35	0.38 099	9.96 535	5	25	
36	9.58 467	30	9.61 936	36	0.38 064	9.96 530	5	24	30 29
37	9.58 497	30	9.61 972	36	0.38 028	9.96 525	5	23	
38	9.58 527	30	9.62 008	36	0.37 992	9.96 520	6	22	1 3.0 2.9
39	9.58 557	31	9.62 043	35	0.37 957	9.96 514	5	21	2 6.0 5.8
				36					3 9.0 8.7
40	9.58 588	30	9.62 079	35	0.37 921	9.96 509	5	20	4 12.0 11.6
41	9.58 618	30	9.62 114	36	0.37 886	9.96 504	6	19	5 15.0 14.5
42	9.58 648	30	9.62 150	35	0.37 850	9.96 498	6	18	6 18.0 17.4
43	9.58 678	31	9.62 185	36	0.37 815	9.96 493	5	17	7 21.0 20.3
44	9.58 709	30	9.62 221	35	0.37 779	9.96 488	5	16	8 24.0 23.2
									9 27.0 26.1
45	9.58 739	30	9.62 256	36	0.37 744	9.96 483	6	15	
46	9.58 769	30	9.62 292	35	0.37 708	9.96 477	5	14	
47	9.58 799	30	9.62 327	35	0.37 673	9.96 472	5	13	
48	9.58 829	30	9.62 362	36	0.37 638	9.96 467	6	12	6 5
49	9.58 859	30	9.62 398	35	0.37 602	9.96 461	5	11	1 0.6 0.5
50	9.58 889	30	9.62 433	35	0.37 567	9.96 456	5	10	2 1.2 1.0
51	9.58 919	30	9.62 468	36	0.37 532	9.96 451	6	9	3 1.8 1.5
52	9.58 949	30	9.62 504	35	0.37 496	9.96 445	5	8	4 2.4 2.0
53	9.58 979	30	9.62 539	35	0.37 461	9.96 440	5	7	5 3.0 2.5
54	9.59 009	30	9.62 574	35	0.37 426	9.96 435	6	6	6 3.6 3.0
									7 4.2 3.5
55	9.59 039	30	9.62 609	36	0.37 391	9.96 429	5	5	8 4.8 4.0
56	9.59 069	29	9.62 645	35	0.37 355	9.96 424	5	4	9 5.4 4.5
57	9.59 098	30	9.62 680	35	0.37 320	9.96 419	6	3	
58	9.59 128	30	9.62 715	35	0.37 285	9.96 413	5	2	
59	9.59 158	30	9.62 750	35	0.37 250	9.96 408	5	1	
60	9.59 188		9.62 785		0.37 215	9.96 403		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

23°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.59 188		9.62 785		0.37 215	9.96 403		60	
1	9.59 218	30	9.62 820	35	0.37 180	9.96 397	6	59	
2	9.59 247	29	9.62 855	35	0.37 145	9.96 392	5	58	
3	9.59 277	30	9.62 890	35	0.37 110	9.96 387	5	57	36 35
4	9.59 307	30	9.62 926	36	0.37 074	9.96 381	6	56	1 3.6 3.5
		29		35			5		2 7.2 7.0
5	9.59 336		9.62 961		0.37 039	9.96 376		55	3 10.8 10.5
6	9.59 366	30	9.62 996	35	0.37 004	9.96 370	6	54	4 14.4 14.0
7	9.59 396	30	9.63 031	35	0.36 969	9.96 365	5	53	5 18.0 17.5
8	9.59 425	29	9.63 066	35	0.36 934	9.96 360	5	52	6 21.6 21.0
9	9.59 455	30	9.63 101	35	0.36 899	9.96 354	6	51	7 25.2 24.5
		29		34			5		8 28.8 28.0
10	9.59 484		9.63 135		0.36 865	9.96 349		50	9 32.4 31.5
11	9.59 514	30	9.63 170	35	0.36 830	9.96 343	6	49	
12	9.59 543	29	9.63 205	35	0.36 795	9.96 338	5	48	
13	9.59 573	30	9.63 240	35	0.36 760	9.96 333	5	47	
14	9.59 602	29	9.63 275	35	0.36 725	9.96 327	6	46	
		30		35			5		34
15	9.59 632		9.63 310		0.36 690	9.96 322		45	1 3.4
16	9.59 661	29	9.63 345	35	0.36 655	9.96 316	6	44	2 6.8
17	9.59 690	29	9.63 379	34	0.36 621	9.96 311	5	43	3 10.2
18	9.59 720	30	9.63 414	35	0.36 586	9.96 305	6	42	4 13.6
19	9.59 749	29	9.63 449	35	0.36 551	9.96 300	5	41	5 17.0
		29		35			6		6 20.4
20	9.59 778		9.63 484		0.36 516	9.96 294		40	7 23.8
21	9.59 808	30	9.63 519	35	0.36 481	9.96 289	5	39	8 27.2
22	9.59 837	29	9.63 553	34	0.36 447	9.96 284	5	38	9 30.6
23	9.59 866	29	9.63 588	35	0.36 412	9.96 278	6	37	
24	9.59 895	29	9.63 623	35	0.36 377	9.96 273	5	36	
				34			6		
25	9.59 924		9.63 657		0.36 343	9.96 267		35	
26	9.59 954	30	9.63 692	35	0.36 308	9.96 262	5	34	30 29
27	9.59 983	29	9.63 726	34	0.36 274	9.96 256	6	33	
28	9.60 012	29	9.63 761	35	0.36 239	9.96 251	5	32	1 3.0 2.9
29	9.60 041	29	9.63 796	35	0.36 204	9.96 245	6	31	2 6.0 5.8
				34			5		3 9.0 8.7
30	9.60 070		9.63 830		0.36 170	9.96 240		30	4 12.0 11.6
31	9.60 099	29	9.63 865	35	0.36 135	9.96 234	6	29	5 15.0 14.5
32	9.60 128	29	9.63 899	34	0.36 101	9.96 229	5	28	6 18.0 17.4
33	9.60 157	29	9.63 934	35	0.36 066	9.96 222	6	27	7 21.0 20.3
34	9.60 186	29	9.63 968	34	0.36 032	9.96 218	5	26	8 24.0 23.2
				35			6		9 27.0 26.1
35	9.60 215		9.64 003		0.35 997	9.96 212		25	
36	9.60 244	29	9.64 037	34	0.35 963	9.96 207	5	24	
37	9.60 273	29	9.64 072	35	0.35 928	9.96 201	6	23	
38	9.60 302	29	9.64 106	34	0.35 894	9.96 196	5	22	
39	9.60 331	29	9.64 140	34	0.35 860	9.96 190	6	21	
		28		35			5		28
40	9.60 359		9.64 175		0.35 825	9.96 185		20	1 2.8
41	9.60 388	29	9.64 209	34	9.35 791	9.96 179	6	19	2 5.6
42	9.60 417	29	9.64 243	34	0.35 757	9.96 174	5	18	3 8.4
43	9.60 446	29	9.64 278	35	0.35 722	9.96 168	6	17	4 11.2
44	9.60 474	28	9.64 312	34	0.35 688	9.96 162	6	16	5 14.0
		29		34			5		6 16.8
45	9.60 503		9.64 346		0.35 654	9.96 157		15	7 19.6
46	9.60 532	29	9.64 381	35	0.35 619	9.96 151	6	14	8 22.4
47	9.60 561	29	9.64 415	34	0.35 585	9.96 146	5	13	9 25.2
48	9.60 589	28	9.64 449	34	0.35 551	9.96 140	6	12	
49	9.60 618	29	9.64 483	34	0.35 517	9.96 135	5	11	
		28		34			6		
50	9.60 646		9.64 517		0.35 483	9.96 129		10	6 5
51	9.60 675	29	9.64 552	35	0.35 448	9.96 123	6	9	
52	9.60 704	29	9.64 586	34	0.35 414	9.96 118	5	8	1 0.6 0.5
53	9.60 732	28	9.64 620	34	0.35 380	9.96 112	6	7	2 1.2 1.0
54	9.60 761	29	9.64 654	34	0.35 346	9.96 107	5	6	3 1.8 1.5
		28		34			6		4 2.4 2.0
55	9.60 789		9.64 688		0.35 312	9.96 101		5	5 3.0 2.5
56	9.60 818	29	9.64 722	34	0.35 278	9.96 095	6	4	6 3.6 3.0
57	9.60 846	28	9.64 756	34	0.35 244	9.96 090	5	3	7 4.2 3.5
58	9.60 875	29	9.64 790	34	0.35 210	9.96 084	6	2	8 4.8 4.0
59	9.60 903	28	9.64 824	34	0.35 176	9.96 079	5	1	9 5.4 4.5
		28		34			6		
60	9.60 931		9.64 858		0.35 142	9.96 073		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

24°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.60 931	29	9.64 858	34	0.35 142	9.96 073	6	60	
1	9.60 960	28	9.64 892	34	0.35 108	9.96 067	5	59	
2	9.60 988	28	9.64 926	34	0.35 074	9.96 062	6	58	
3	9.61 016	29	9.64 960	34	0.35 040	9.96 056	6	57	34 | 33
4	9.61 045	28	9.64 994	34	0.35 006	9.96 050	5	56	1 | 3.4 | 3.3
5	9.61 073	28	9.65 028	34	0.34 972	9.96 045	6	55	2 | 6.8 | 6.6
6	9.61 101	28	9.65 062	34	0.34 938	9.96 039	5	54	3 | 10.2 | 9.9
7	9.61 129	29	9.65 096	34	0.34 904	9.96 034	6	53	4 | 13.6 | 13.2
8	9.61 158	28	9.65 130	34	0.34 870	9.96 028	6	52	5 | 17.0 | 16.5
9	9.61 186	28	9.65 164	33	0.34 836	9.96 022	5	51	6 | 20.4 | 19.8
10	9.61 214	28	9.65 197	34	0.34 803	9.96 017	6	50	7 | 23.8 | 23.1
11	9.61 242	28	9.65 231	34	0.34 769	9.96 011	6	49	8 | 27.2 | 26.4
12	9.61 270	28	9.65 265	34	0.34 735	9.96 005	5	48	9 | 30.6 | 29.7
13	9.61 298	28	9.65 299	34	0.34 701	9.96 000	6	47	
14	9.61 326	28	9.65 333	33	0.34 667	9.95 994	6	46	
15	9.61 354	28	9.65 366	34	0.34 634	9.95 988	6	45	29
16	9.61 382	29	9.65 400	34	0.34 600	9.95 982	5	44	1 | 2.9
17	9.61 411	27	9.65 434	33	0.34 566	9.95 977	6	43	2 | 5.8
18	9.61 438	28	9.65 467	34	0.34 533	9.95 971	6	42	3 | 8.7
19	9.61 466	28	9.65 501	34	0.34 499	9.95 965	5	41	4 | 11.6
20	9.61 494	28	9.65 535	33	0.34 465	9.95 960	6	40	5 | 14.5
21	9.61 522	28	9.65 568	34	0.34 432	9.95 954	6	39	6 | 17.4
22	9.61 550	28	9.65 602	34	0.34 398	9.95 948	6	38	7 | 20.3
23	9.61 578	28	9.65 636	33	0.34 364	9.95 942	5	37	8 | 23.2
24	9.61 606	28	9.65 669	34	0.34 331	9.95 937	6	36	9 | 26.1
25	9.61 634	28	9.65 703	33	0.34 297	9.95 931	6	35	
26	9.61 662	27	9.65 736	34	0.34 264	9.95 925	5	34	
27	9.61 689	28	9.65 770	33	0.34 230	9.95 920	6	33	28
28	9.61 717	28	9.65 803	34	0.34 197	9.95 914	6	32	1 | 2.8
29	9.61 745	28	9.65 837	33	0.34 163	9.95 908	6	31	2 | 5.6
30	9.61 773	27	9.65 870	34	0.34 130	9.95 902	5	30	3 | 8.4
31	9.61 800	28	9.65 904	33	0.34 096	9.95 897	6	29	4 | 11.2
32	9.61 828	28	9.65 937	34	0.34 063	9.95 891	6	28	5 | 14.0
33	9.61 856	27	9.65 971	33	0.34 029	9.95 885	6	27	6 | 16.8
34	9.61 883	28	9.66 004	34	0.33 996	9.95 879	6	26	7 | 19.6
35	9.61 911	28	9.66 038	33	0.33 962	9.95 873	5	25	8 | 22.4
36	9.61 939	27	9.66 071	33	0.33 929	9.95 868	6	24	9 | 25.2
37	9.61 966	28	9.66 104	34	0.33 896	9.95 862	6	23	
38	9.61 994	27	9.66 138	33	0.33 862	9.95 856	6	22	
39	9.62 021	28	9.66 171	33	0.33 829	9.95 850	6	21	27
40	9.62 049	27	9.66 204	34	0.33 796	9.95 844	5	20	1 | 2.7
41	9.62 076	28	9.66 238	33	0.33 762	9.95 839	6	19	2 | 5.4
42	9.62 104	27	9.66 271	33	0.33 729	9.95 833	6	18	3 | 8.1
43	9.62 131	28	9.66 304	33	0.33 696	9.95 827	6	17	4 | 10.8
44	9.62 159	27	9.66 337	34	0.33 663	9.95 821	6	16	5 | 13.5
45	9.62 186	28	9.66 371	33	0.33 629	9.95 815	5	15	6 | 16.2
46	9.62 214	27	9.66 404	33	0.33 596	9.95 810	6	14	7 | 18.9
47	9.62 241	27	9.66 437	33	0.33 563	9.95 804	6	13	8 | 21.6
48	9.62 268	28	9.66 470	33	0.33 530	9.95 798	6	12	9 | 24.3
49	9.62 296	27	9.66 503	34	0.33 497	9.95 792	6	11	
50	9.62 323	27	9.66 537	33	0.33 463	9.95 786	6	10	6 | 5
51	9.62 350	27	9.66 570	33	0.33 430	9.95 780	5	9	1 | 0.6 | 0.5
52	9.62 377	28	9.66 603	33	0.33 397	9.95 775	6	8	2 | 1.2 | 1.0
53	9.62 405	27	9.66 636	33	0.33 364	9.95 769	6	7	3 | 1.8 | 1.5
54	9.62 432	27	9.66 669	33	0.33 331	9.95 763	6	6	4 | 2.4 | 2.0
55	9.62 459	27	9.66 702	33	0.33 298	9.95 757	6	5	5 | 3.0 | 2.5
56	9.62 486	27	9.66 735	33	0.33 265	9.95 751	6	4	6 | 3.6 | 3.0
57	9.62 513	28	9.66 768	33	0.33 232	9.95 745	6	3	7 | 4.2 | 3.5
58	9.62 541	27	9.66 801	33	0.33 199	9.95 739	6	2	8 | 4.8 | 4.0
59	9.62 568	27	9.66 834	33	0.33 166	9.95 733	5	1	9 | 5.4 | 4.5
60	9.62 595		9.66 867		0.33 133	9.95 728		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

25°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.62 595		9.66 867		0.33 133	9.95 728		60	
1	9.62 622	27	9.66 900	33	0.33 100	9.95 722	6	59	
2	9.62 649	27	9.66 933	33	0.33 067	9.95 716	6	58	
3	9.62 676	27	9.66 966	33	0.33 034	9.95 710	6	57	33 32
4	9.62 703	27	9.66 999	33	0.33 001	9.95 704	6	56	1 3.3 3.2
5	9.62 730		9.67 032		0.32 968	9.95 698		55	2 6.6 6.4
6	9.62 757	27	9.67 065	33	0.32 935	9.95 692	6	54	3 9.9 9.6
7	9.62 784	27	9.67 098	33	0.32 902	9.95 686	6	53	4 13.2 12.8
8	9.62 811	27	9.67 131	33	0.32 869	9.95 680	6	52	5 16.5 16.0
9	9.62 838	27	9.67 163	32	0.32 837	9.95 674	6	51	6 19.8 19.2
10	9.62 865		9.67 196	33	0.32 804	9.95 668		50	7 23.1 22.4
11	9.62 892	27	9.67 229	33	0.32 771	9.95 663	5	49	8 26.4 25.6
12	9.62 918	26	9.67 262	33	0.32 738	9.95 657	6	48	9 29.7 28.8
13	9.62 945	27	9.67 295	32	0.32 705	9.95 651	6	47	
14	9.62 972	27	9.67 327	33	0.32 673	9.95 645	6	46	
15	9.62 999		9.67 360		0.32 640	9.95 639		45	27
16	9.63 026	27	9.67 393	33	0.32 607	9.95 633	6	44	1 2.7
17	9.63 052	26	9.67 426	33	0.32 574	9.95 627	6	43	2 5.4
18	9.63 079	27	9.67 458	32	0.32 542	9.95 621	6	42	3 8.1
19	9.63 106	27	9.67 491	33	0.32 509	9.95 615	6	41	4 10.8
20	9.63 133		9.67 524		0.32 476	9.95 609		40	5 13.5
21	9.63 159	26	9.67 556	32	0.32 444	9.95 603	6	39	6 16.2
22	9.63 186	27	9.67 589	33	0.32 411	9.95 597	6	38	7 18.9
23	9.63 213	27	9.67 622	33	0.32 378	9.95 591	6	37	8 21.6
24	9.63 239	26	9.67 654	32	0.32 346	9.95 585	6	36	9 24.3
25	9.63 266		9.67 687		0.32 313	9.95 579		35	
26	9.63 292	26	9.67 719	32	0.32 281	9.95 573	6	34	26
27	9.63 319	27	9.67 752	33	0.32 248	9.95 567	6	33	
28	9.63 345	26	9.67 785	33	0.32 215	9.95 561	6	32	1 2.6
29	9.63 372	27	9.67 817	32	0.32 183	9.95 555	6	31	2 5.2
30	9.63 398	26	9.67 850	33	0.32 150	9.95 549		30	3 7.8
31	9.63 425	27	9.67 882	32	0.32 118	9.95 543	6	29	4 10.4
32	9.63 451	26	9.67 915	33	0.32 085	9.95 537	6	28	5 13.0
33	9.63 478	27	9.67 947	32	0.32 053	9.95 531	6	27	6 15.6
34	9.63 504	26	9.67 980	33	0.32 020	9.95 525	6	26	7 18.2
35	9.63 531	27	9.68 012	32	0.31 988	9.95 519	6	25	8 20.8
36	9.63 557	26	9.68 044	33	0.31 956	9.95 513	6	24	9 23.4
37	9.63 583	26	9.68 077	32	0.31 923	9.95 507	6	23	
38	9.63 610	27	9.68 109	33	0.31 891	9.95 500	7	22	
39	9.63 636	26	9.68 142	32	0.31 858	9.95 494	6	21	7
40	9.63 662	26	9.68 174	32	0.31 826	9.95 488	6	20	1 0.7
41	9.63 689	27	9.68 206	33	0.31 794	9.95 482	6	19	2 1.4
42	9.63 715	26	9.68 239	32	0.31 761	9.95 476	6	18	3 2.1
43	9.63 741	26	9.68 271	32	0.31 729	9.95 470	6	17	4 2.8
44	9.63 767	26	9.68 303	33	0.31 697	9.95 464	6	16	5 3.5
45	9.63 794	27	9.68 336	32	0.31 664	9.95 458		15	6 4.2
46	9.63 820	26	9.68 368	32	0.31 632	9.95 452	6	14	7 4.9
47	9.63 846	26	9.68 400	32	0.31 600	9.95 446	6	13	8 5.6
48	9.63 872	26	9.68 432	33	0.31 568	9.95 440	6	12	9 6.3
49	9.63 898	26	9.68 465	32	0.31 535	9.95 434	6	11	
50	9.63 924	26	9.68 497	32	0.31 503	9.95 427	7	10	6 5
51	9.63 950	26	9.68 529	32	0.31 471	9.95 421	6	9	1 0.6 0.5
52	9.63 976	26	9.68 561	32	0.31 439	9.95 415	6	8	2 1.2 1.0
53	9.64 002	26	9.68 593	33	0.31 407	9.95 409	6	7	3 1.8 1.5
54	9.64 028	26	9.68 626	32	0.31 374	9.95 403	6	6	4 2.4 2.0
55	9.64 054	26	9.68 658	32	0.31 342	9.95 397	6	5	5 3.0 2.5
56	9.64 080	26	9.68 690	32	0.31 310	9.95 391	7	4	6 3.6 3.0
57	9.64 106	26	9.68 722	32	0.31 278	9.95 384	6	3	7 4.2 3.5
58	9.64 132	26	9.68 754	32	0.31 246	9.95 378	6	2	8 4.8 4.0
59	9.64 158	26	9.68 786	32	0.31 214	9.95 372	6	1	9 5.4 4.5
60	9.64 184		9.68 818		0.31 182	9.95 366		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
					26°				
0	9.64 184	26	9.68 818	32	0.31 182	9.95 366	6	60	
1	9.64 210	26	9.68 850	32	0.31 150	9.95 360	6	59	
2	9.64 236	26	9.68 882	32	0.31 118	9.95 354	6	58	32 31
3	9.64 262	26	9.68 914	32	0.31 086	9.95 348	7	57	1 3.2 3.1
4	9.64 288	25	9.68 946	32	0.31 054	9.95 341	6	56	2 6.4 6.2
5	9.64 313	26	9.68 978	32	0.31 022	9.95 335	6	55	3 9.6 9.3
6	9.64 339	26	9.69 010	32	0.30 990	9.95 329	6	54	4 12.8 12.4
7	9.64 365	26	9.69 042	32	0.30 958	9.95 323	6	53	5 16.0 15.5
8	9.64 391	26	9.69 074	32	0.30 926	9.95 317	7	52	6 19.2 18.6
9	9.64 417	25	9.69 106	32	0.30 894	9.95 310	6	51	7 22.4 21.7
10	9.64 442	26	9.69 138	32	0.30 862	9.95 304	6	50	8 25.6 24.8
11	9.64 468	26	9.69 170	32	0.30 830	9.95 298	6	49	9 28.8 27.9
12	9.64 494	25	9.69 202	32	0.30 798	9.95 292	6	48	
13	9.64 519	26	9.69 234	32	0.30 766	9.95 286	7	47	
14	9.64 545	26	9.69 266	32	0.30 734	9.95 279	6	46	26
15	9.64 571	25	9.69 298	31	0.30 702	9.95 273	6	45	1 2.6
16	9.64 596	26	9.69 329	32	0.30 671	9.95 267	6	44	2 5.2
17	9.64 622	25	9.69 361	32	0.30 639	9.95 261	7	43	3 7.8
18	9.64 647	26	9.69 393	32	0.30 607	9.95 254	6	42	4 10.4
19	9.64 673	25	9.69 425	32	0.30 575	9.95 248	6	41	5 13.0
20	9.64 698	26	9.69 457	31	0.30 543	9.95 242	6	40	6 15.6
21	9.64 724	25	9.69 488	32	0.30 512	9.95 236	7	39	7 18.2
22	9.64 749	26	9.69 520	32	0.30 480	9.95 229	6	38	8 20.8
23	9.64 775	25	9.69 552	32	0.30 448	9.95 223	6	37	9 23.4
24	9.64 800	26	9.69 584	31	0.30 416	9.95 217	6	36	
25	9.64 826	25	9.69 615	32	0.30 385	9.95 211	7	35	25
26	9.64 851	26	9.69 647	32	0.30 353	9.95 204	6	34	1 2.5
27	9.64 877	25	9.69 679	31	0.30 321	9.95 198	6	33	2 5.0
28	9.64 902	25	9.69 710	32	0.30 290	9.95 192	7	32	3 7.5
29	9.64 927	26	9.69 742	32	0.30 258	9.95 185	6	31	4 10.0
30	9.64 953	25	9.69 774	31	0.30 226	9.95 179	6	30	5 12.5
31	9.64 978	25	9.69 805	32	0.30 195	9.95 173	6	29	6 15.0
32	9.65 003	26	9.69 837	31	0.30 163	9.95 167	7	28	7 17.5
33	9.65 029	25	9.69 868	32	0.30 132	9.95 160	6	27	8 20.0
34	9.65 054	25	9.69 900	32	0.30 100	9.95 154	6	26	9 22.5
35	9.65 079	25	9.69 932	31	0.30 068	9.95 148	7	25	
36	9.65 104	26	9.69 963	32	0.30 037	9.95 141	6	24	
37	9.65 130	25	9.69 995	31	0.30 005	9.95 135	6	23	24
38	9.65 155	25	9.70 026	32	0.29 974	9.95 129	7	22	1 2.4
39	9.65 180	25	9.70 058	31	0.29 942	9.95 122	6	21	2 4.8
40	9.65 205	25	9.70 089	32	0.29 911	9.95 116	6	20	3 7.2
41	9.65 230	25	9.70 121	31	0.29 879	9.95 110	7	19	4 9.6
42	9.65 255	26	9.70 152	32	0.29 848	9.95 103	6	18	5 12.0
43	9.65 281	25	9.70 184	31	0.29 816	9.95 097	7	17	6 14.4
44	9.65 306	25	9.70 215	32	0.29 785	9.95 090	7	16	7 16.8
45	9.65 331	25	9.70 247	31	0.29 753	9.95 084	6	15	8 19.2
46	9.65 356	25	9.70 278	31	0.29 722	9.95 078	7	14	9 21.6
47	9.65 381	25	9.70 309	32	0.29 691	9.95 071	6	13	
48	9.65 406	25	9.70 341	31	0.29 659	9.95 065	6	12	7 6
49	9.65 431	25	9.70 372	32	0.29 628	9.95 059	7	11	1 0.7 0.6
50	9.65 456	25	9.70 404	31	0.29 596	9.95 052	6	10	2 1.4 1.2
51	9.65 481	25	9.70 435	31	0.29 565	9.95 046	7	9	3 2.1 1.8
52	9.65 506	25	9.70 466	32	0.29 534	9.95 039	6	8	4 2.8 2.4
53	9.65 531	25	9.70 498	31	0.29 502	9.95 033	6	7	5 3.5 3.0
54	9.65 556	24	9.70 529	31	0.29 471	9.95 027	7	6	6 4.2 3.6
55	9.65 580	25	9.70 560	32	0.29 440	9.95 020	6	5	7 4.9 4.2
56	9.65 605	25	9.70 592	31	0.29 408	9.95 014	7	4	8 5.6 4.8
57	9.65 630	25	9.70 623	31	0.29 377	9.95 007	6	3	9 6.3 5.4
58	9.65 655	25	9.70 654	31	0.29 346	9.95 001	6	2	
59	9.65 680	25	9.70 685	32	0.29 315	9.94 995	7	1	
60	9.65 705		9.70 717		0.29 283	9.94 988		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
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TABLE II.—*Common logarithms of circular functions*—Continued

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′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.65 705$\bar{5}$		9.70 717		0.29 283	9.94 988		60	
1	9.65 729	24	9.70 748	31	0.29 252	9.94 982	6	59	
2	9.65 754	25	9.70 779	31	0.29 221	9.94 975	7	58	
3	9.65 779	25	9.70 810	31	0.29 190	9.94 969	6	57	32 31
4	9.65 804	25	9.70 841	31	0.29 159	9.94 962	7	56	1 3.2 3.1
		24		32			6		2 6.4 6.2
5	9.65 828		9.70 873		0.29 127	9.94 956		55	3 9.6 9.3
6	9.65 853	25	9.70 904	31	0.29 096	9.94 949	7	54	4 12.8 12.4
7	9.65 878	25	9.70 93$\bar{5}$	31	0.29 065	9.94 943	6	53	5 16.0 15.5
8	9.65 902	24	9.70 966	31	0.29 034	9.94 936	7	52	6 19.2 18.6
9	9.65 927	25	9.70 997	31	0.29 003	9.94 930	6	51	7 22.4 21.7
		25		31			7		8 25.6 24.8
10	9.65 952		9.71 028		0.28 972	9.94 923		50	9 28.8 27.9
11	9.65 976	24	9.71 059	31	0.28 941	9.94 917	6	49	
12	9.66 001	25	9.71 090	31	0.28 910	9.94 911	6	48	
13	9.66 025	24	9.71 121	31	0.28 879	9.94 904	7	47	
14	9.66 050	25	9.71 153	32	0.28 847	9.94 898	6	46	30
		25		31			7		
15	9.66 075$\bar{5}$		9.71 184		0.28 816	9.94 891		45	1 3.0
16	9.66 099	24	9.71 21$\bar{5}$	31	0.28 785	9.94 88$\bar{5}$	6	44	2 6.0
17	9.66 124	25	9.71 246	31	0.28 754	9.94 878	7	43	3 9.0
18	9.66 148	24	9.71 277	31	0.28 723	9.94 871	7	42	4 12.0
19	9.66 173	25	9.71 308	31	0.28 692	9.94 86$\bar{5}$	6	41	5 15.0
		24		31			7		6 18.0
20	9.66 197		9.71 339		0.28 661	9.94 858		40	7 21.0
21	9.66 221	24	9.71 370	31	0.28 630	9.94 852	6	39	8 24.0
22	9.66 246	25	9.71 401	31	0.28 599	9.94 845	7	38	9 27.0
23	9.66 270	24	9.71 431	30	0.28 569	9.94 839	6	37	
24	9.66 29$\bar{5}$	25	9.71 462	31	0.28 538	9.94 832	7	36	
		24		31			6		
25	9.66 319		9.71 493		0.28 507	9.94 826		35	25 24
26	9.66 343	24	9.71 524	31	0.28 476	9.94 819	7	34	
27	9.66 368	25	9.71 555	31	0.28 44$\bar{5}$	9.94 813	6	33	1 2.5 2.4
28	9.66 392	24	9.71 586	31	0.28 414	9.94 806	7	32	2 5.0 4.8
29	9.66 416	24	9.71 617	31	0.28 383	9.94 799	7	31	3 7.5 7.2
		25		31			6		4 10.0 9.6
30	9.66 441		9.71 648		0.28 352	9.94 793		30	5 12.5 12.0
31	9.66 46$\bar{5}$	24	9.71 679	31	0.28 321	9.94 786	7	29	6 15.0 14.4
32	9.66 489	24	9.71 709	30	0.28 291	9.94 780	6	28	7 17.5 16.8
33	9.66 513	24	9.71 740	31	0.28 260	9.94 773	7	27	8 20.0 19.2
34	9.66 537	24	9.71 771	31	0.28 229	9.94 767	6	26	9 22.5 21.6
		25		31			7		
35	9.66 562		9.71 802		0.28 198	9.94 760		25	
36	9.66 586	24	9.71 833	31	0.28 167	9.94 753	7	24	
37	9.66 610	24	9.71 863	30	0.28 137	9.94 747	6	23	
38	9.66 634	24	9.71 894	31	0.28 106	9.94 740	7	22	23
39	9.66 658	24	9.71 92$\bar{5}$	31	0.28 075	9.94 734	6	21	1 2.3
		24		30			7		2 4.6
40	9.66 682		9.71 955		0.28 04$\bar{5}$	9.94 727		20	3 6.9
41	9.66 706	24	9.71 986	31	0.28 014	9.94 720	7	19	4 9.2
42	9.66 731	25	9.72 017	31	0.27 983	9.94 714	6	18	5 11.5
43	9.66 75$\bar{5}$	24	9.72 048	31	0.27 952	9.94 707	7	17	6 13.8
44	9.66 779	24	9.72 078	30	0.27 922	9.94 700	7	16	7 16.1
		24		31			6		8 18.4
45	9.66 803		9.72 109		0.27 891	9.94 694		15	9 20.7
46	9.66 827	24	9.72 140	31	0.27 860	9.94 687	7	14	
47	9.66 851	24	9.72 170	30	0.27 830	9.94 680	7	13	
48	9.66 87$\bar{5}$	24	9.72 201	31	0.27 799	9.94 674	6	12	
49	9.66 899	24	9.72 231	30	0.27 769	9.94 667	7	11	
		23		31			7		
50	9.66 922		9.72 262		0.27 738	9.94 660		10	7 6
51	9.66 946	24	9.72 293	31	0.27 707	9.94 654	6	9	1 0.7 0.6
52	9.66 970	24	9.72 323	30	0.27 677	9.94 647	7	8	2 1.4 1.2
53	9.66 994	24	9.72 354	31	0.27 646	9.94 640	7	7	3 2.1 1.8
54	9.67 018	24	9.72 384	30	0.27 616	9.94 634	6	6	4 2.8 2.4
		24		31			7		5 3.5 3.0
55	9.67 042		9.72 41$\bar{5}$		0.27 585	9.94 627		5	6 4.2 3.6
56	9.67 066	24	9.72 445	30	0.27 55$\bar{5}$	9.94 620	7	4	7 4.9 4.2
57	9.67 090	24	9.72 476	31	0.27 524	9.94 614	6	3	8 5.6 4.8
58	9.67 113	23	9.72 506	30	0.27 494	9.94 607	7	2	9 6.3 5.4
59	9.67 137	24	9.72 537	31	0.27 463	9.94 600	7	1	
		24		30			7		
60	9.67 161		9.72 567		0.27 433	9.94 593		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

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′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.67 161	24	9.72 567	31	0.27 433	9.94 593	6	60	
1	9.67 185	23	9.72 598	30	0.27 402	9.94 587	7	59	
2	9.67 208	24	9.72 628	31	0.27 372	9.94 580	7	58	
3	9.67 232	24	9.72 659	30	0.27 341	9.94 573	6	57	31 30
4	9.67 256	24	9.72 689	31	0.27 311	9.94 567	7	56	1 3.1 3.0
5	9.67 280	23	9.72 720	30	0.27 280	9.94 560	7	55	2 6.2 6.0
6	9.67 303	24	9.72 750	30	0.27 250	9.94 553	7	54	3 9.3 9.0
7	9.67 327	23	9.72 780	31	0.27 220	9.94 546	6	53	4 12.4 12.0
8	9.67 350	24	9.72 811	30	0.27 189	9.94 540	7	52	5 15.5 15.0
9	9.67 374	24	9.72 841	31	0.27 159	9.94 533	7	51	6 18.6 18.0
10	9.67 398	23	9.72 872	30	0.27 128	9.94 526	7	50	7 21.7 21.0
11	9.67 421	24	9.72 902	30	0.27 098	9.94 519	6	49	8 24.8 24.0
12	9.67 445	23	9.72 932	31	0.27 068	9.94 513	7	48	9 27.9 27.0
13	9.67 468	24	9.72 963	30	0.27 037	9.94 506	7	47	
14	9.67 492	23	9.72 993	30	0.27 007	9.94 499	7	46	
15	9.67 515	24	9.73 023	31	0.26 977	9.94 492	7	45	29
16	9.67 539	23	9.73 054	30	0.26 946	9.94 485	6	44	1 2.9
17	9.67 562	24	9.73 084	30	0.26 916	9.94 479	7	43	2 5.8
18	9.67 586	23	9.73 114	30	0.26 886	9.94 472	7	42	3 8.7
19	9.67 609	24	9.73 144	31	0.26 856	9.94 465	7	41	4 11.6
20	9.67 633	23	9.73 175	30	0.26 825	9.94 458	7	40	5 14.5
21	9.67 656	24	9.73 205	30	0.26 795	9.94 451	6	39	6 17.4
22	9.67 680	23	9.73 235	30	0.26 765	9.94 445	7	38	7 20.3
23	9.67 703	23	9.73 265	30	0.26 735	9.94 438	7	37	8 23.2
24	9.67 726	24	9.73 295	31	0.26 705	9.94 431	7	36	9 26.1
25	9.67 750	23	9.73 326	30	0.26 674	9.94 424	7	35	
26	9.67 773	23	9.73 356	30	0.26 644	9.94 417	7	34	
27	9.67 796	24	9.73 386	30	0.26 614	9.94 410	6	33	24 23
28	9.67 820	23	9.73 416	30	0.26 584	9.94 404	7	32	1 2.4 2.3
29	9.67 843	23	9.73 446	30	0.26 554	9.94 397	7	31	2 4.8 4.6
30	9.67 866	24	9.73 476	31	0.26 524	9.94 390	7	30	3 7.2 6.9
31	9.67 890	23	9.73 507	30	0.26 493	9.94 383	7	29	4 9.6 9.2
32	9.67 913	23	9.73 537	30	0.26 463	9.94 376	7	28	5 12.0 11.5
33	9.67 936	23	9.73 567	30	0.26 433	9.94 369	7	27	6 14.4 13.8
34	9.67 959	23	9.73 597	30	0.26 403	9.94 362	7	26	7 16.8 16.1
35	9.67 982	24	9.73 627	30	0.26 373	9.94 355	6	25	8 19.2 18.4
36	9.68 006	23	9.73 657	30	0.26 343	9.94 349	7	24	9 21.6 20.7
37	9.68 029	23	9.73 687	30	0.26 313	9.94 342	7	23	
38	9.68 052	23	9.73 717	30	0.26 283	9.94 335	7	22	
39	9.68 075	23	9.73 747	30	0.26 253	9.94 328	7	21	22
40	9.68 098	23	9.73 777	30	0.26 223	9.94 321	7	20	1 2.2
41	9.68 121	23	9.73 807	30	0.26 193	9.94 314	7	19	2 4.4
42	9.68 144	23	9.73 837	30	0.26 163	9.94 307	7	18	3 6.6
43	9.68 167	23	9.73 867	30	0.26 133	9.94 300	7	17	4 8.8
44	9.68 190	23	9.73 897	30	0.26 103	9.94 293	7	16	5 11.0
45	9.68 213	24	9.73 927	30	0.26 073	9.94 286	7	15	6 13.2
46	9.68 237	23	9.73 957	30	0.26 043	9.94 279	6	14	7 15.4
47	9.68 260	23	9.73 987	30	0.26 013	9.94 273	7	13	8 17.6
48	9.68 283	22	9.74 017	30	0.25 983	9.94 266	7	12	9 19.8
49	9.68 305	23	9.74 047	30	0.25 953	9.94 259	7	11	
50	9.68 328	23	9.74 077	30	0.25 923	9.94 252	7	10	7 6
51	9.68 351	23	9.74 107	30	0.25 893	9.94 245	7	9	1 0.7 0.6
52	9.68 374	23	9.74 137	29	0.25 863	9.94 238	7	8	2 1.4 1.2
53	9.68 397	23	9.74 166	30	0.25 834	9.94 231	7	7	3 2.1 1.8
54	9.68 420	23	9.74 196	30	0.25 804	9.94 224	7	6	4 2.8 2.4
55	9.68 443	23	9.74 226	30	0.25 774	9.94 217	7	5	5 3.5 3.0
56	9.68 466	23	9.74 256	30	0.25 744	9.94 210	7	4	6 4.2 3.6
57	9.68 489	23	9.74 286	30	0.25 714	9.94 203	7	3	7 4.9 4.2
58	9.68 512	22	9.74 316	29	0.25 684	9.94 196	7	2	8 5.6 4.8
59	9.68 534	23	9.74 345	30	0.25 655	9.94 189	7	1	9 6.3 5.4
60	9.68 557		9.74 375		0.25 625	9.94 182		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

29°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.68 557	23	9.74 375	30	0.25 625	9.94 182	7	60	
1	9.68 580	23	9.74 405	30	0.25 595	9.94 175	7	59	
2	9.68 603	22	9.74 435	30	0.25 565	9.94 168	7	58	
3	9.68 625	23	9.74 465	29	0.25 535	9.94 161	7	57	30
4	9.68 648	23	9.74 494	30	0.25 506	9.94 154	7	56	1 3.0
5	9.68 671	23	9.74 524	30	0.25 476	9.94 147	7	55	2 6.0
6	9.68 694	22	9.74 554	29	0.25 446	9.94 140	7	54	3 9.0
7	9.68 716	23	9.74 583	30	0.25 417	9.94 133	7	53	4 12.0
8	9.68 739	23	9.74 613	30	0.25 387	9.94 126	7	52	5 15.0
9	9.68 762	22	9.74 643	30	0.25 357	9.94 119	7	51	6 18.0
10	9.68 784	23	9.74 673	29	0.25 327	9.94 112	7	50	7 21.0
11	9.68 807	22	9.74 702	30	0.25 298	9.94 105	7	49	8 24.0
12	9.68 829	23	9.74 732	30	0.25 268	9.94 098	8	48	9 27.0
13	9.68 852	23	9.74 762	29	0.25 238	9.94 090	7	47	
14	9.68 875	22	9.74 791	30	0.25 209	9.94 083	7	46	
15	9.68 897	23	9.74 821	30	0.25 179	9.94 076	7	45	29
16	9.68 920	22	9.74 851	29	0.25 149	9.94 069	7	44	1 2.9
17	9.68 942	23	9.74 880	30	0.25 120	9.94 062	7	43	2 5.8
18	9.68 965	22	9.74 910	29	0.25 090	9.94 055	7	42	3 8.7
19	9.68 987	23	9.74 939	30	0.25 061	9.94 048	7	41	4 11.6
20	9.69 010	22	9.74 969	29	0.25 031	9.94 041	7	40	5 14.5
21	9.69 032	23	9.74 998	30	0.25 002	9.94 034	7	39	6 17.4
22	9.69 055	22	9.75 028	30	0.24 972	9.94 027	7	38	7 20.3
23	9.69 077	23	9.75 058	29	0.24 942	9.94 020	8	37	8 23.2
24	9.69 100	22	9.75 087	30	0.24 913	9.94 012	7	36	9 26.1
25	9.69 122	22	9.75 117	29	0.24 883	9.94 005	7	35	
26	9.69 144	23	9.75 146	30	0.24 854	9.93 998	7	34	23
27	9.69 167	22	9.75 176	29	0.24 824	9.93 991	7	33	1 2.3
28	9.69 189	23	9.75 205	30	0.24 795	9.93 984	7	32	2 4.6
29	9.69 212	22	9.75 235	29	0.24 765	9.93 977	7	31	3 6.9
30	9.69 234	22	9.75 264	30	0.24 736	9.93 970	7	30	4 9.2
31	9.69 256	23	9.75 294	29	0.24 706	9.93 963	8	29	5 11.5
32	9.69 279	22	9.75 323	30	0.24 677	9.93 955	7	28	6 13.8
33	9.69 301	22	9.75 353	29	0.24 647	9.93 948	7	27	7 16.1
34	9.69 323	22	9.75 382	29	0.24 618	9.93 941	7	26	8 18.4
35	9.69 345	23	9.75 411	30	0.24 589	9.93 934	7	25	9 20.7
36	9.69 368	22	9.75 441	29	0.24 559	9.93 927	7	24	
37	9.69 390	22	9.75 470	30	0.24 530	9.93 920	8	23	
38	9.69 412	22	9.75 500	29	0.24 500	9.93 912	7	22	22
39	9.69 434	22	9.75 529	29	0.24 471	9.93 905	7	21	1 2.2
40	9.69 456	23	9.75 558	30	0.24 442	9.93 898	7	20	2 4.4
41	9.69 479	22	9.75 588	29	0.24 412	9.93 891	7	19	3 6.6
42	9.69 501	22	9.75 617	30	0.24 383	9.93 884	8	18	4 8.8
43	9.69 523	22	9.75 647	29	0.24 353	9.93 876	7	17	5 11.0
44	9.69 545	22	9.75 676	29	0.24 324	9.93 869	7	16	6 13.2
45	9.69 567	22	9.75 705	30	0.24 295	9.93 862	7	15	7 15.4
46	9.69 589	22	9.75 735	29	0.24 265	9.93 855	8	14	8 17.6
47	9.69 611	22	9.75 764	29	0.24 236	9.93 847	7	13	9 19.8
48	9.69 633	22	9.75 793	29	0.24 207	9.93 840	7	12	
49	9.69 655	22	9.75 822	30	0.24 178	9.93 833	7	11	
50	9.69 677	22	9.75 852	29	0.24 148	9.93 826	7	10	8 7
51	9.69 699	22	9.75 881	29	0.24 119	9.93 819	8	9	1 0.8 0.7
52	9.69 721	22	9.75 910	29	0.24 090	9.93 811	7	8	2 1.6 1.4
53	9.69 743	22	9.75 939	30	0.24 061	9.93 804	7	7	3 2.4 2.1
54	9.69 765	22	9.75 969	29	0.24 031	9.93 797	8	6	4 3.2 2.8
55	9.69 787	22	9.75 998	29	0.24 002	9.93 789	7	5	5 4.0 3.5
56	9.69 809	22	9.76 027	29	0.23 973	9.93 782	7	4	6 4.8 4.2
57	9.69 831	22	9.76 056	30	0.23 944	9.93 775	7	3	7 5.6 4.9
58	9.69 853	22	9.76 086	29	0.23 914	9.93 768	8	2	8 6.4 5.6
59	9.69 875	22	9.76 115	29	0.23 885	9.93 760	7	1	9 7.2 6.3
60	9.69 897		9.76 144		0.23 856	9.93 753		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

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′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.69 897	22	9.76 144	29	0.23 856	9.93 753	7	60	
1	9.69 919	22	9.76 173	29	0.23 827	9.93 746	8	59	
2	9.69 941	22	9.76 202	29	0.23 798	9.93 738	7	58	
3	9.69 963	21	9.76 231	30	0.23 769	9.93 731	7	57	30 29
4	9.69 984	22	9.76 261	29	0.23 739	9.93 724	7	56	1 3.0 2.9
5	9.70 006	22	9.76 290	29	0.23 710	9.93 717	8	55	2 6.0 5.8
6	9.70 028	22	9.76 319	29	0.23 681	9 93 709	7	54	3 9.0 8.7
7	9.70 050	22	9.76 348	29	0.23 652	9.93 702	7	53	4 12.0 11.6
8	9.70 072	21	9.76 377	29	0.23 623	9.93 695	8	52	5 15.0 14.5
9	9.70 093	22	9.76 406	29	0.23 594	9.93 687	7	51	6 18.0 17.4
10	9.70 115	22	9.76 435	29	0.23 565	9.93 680	7	50	7 21.0 20.3
11	9.70 137	22	9.76 464	29	0.23 536	9.93 673	8	49	8 24.0 23.2
12	9.70 159	21	9.76 493	29	0.23 507	9.93 665	7	48	9 27.0 26.1
13	9.70 180	22	9.76 522	29	0.23 478	9.93 658	8	47	
14	9.70 202	22	9.76 551	29	0.23 449	9.93 650	7	46	28
15	9.70 224	21	9.76 580	29	0.23 420	9.93 643	7	45	1 2.8
16	9.70 245	22	9.76 609	30	0.23 391	9.93 636	8	44	2 5.6
17	9.70 267	21	9.76 639	29	0.23 361	9 93 628	7	43	3 8.4
18	9.70 288	22	9.76 668	29	0.23 332	9.93 621	7	42	4 11.2
19	9.70 310	22	9.76 697	28	0.23 303	9.93 614	8	41	5 14.0
20	9.70 332	21	9.76 725	29	0.23 275	9.93 606	7	40	6 16.8
21	9.70 353	22	9.76 754	29	0.23 246	9.93 599	8	39	7 19.6
22	9.70 375	21	9.76 783	29	0.23 217	9.93 591	7	38	8 22.4
23	9.70 396	22	9.76 812	29	0.23 188	9.93 584	7	37	9 25.2
24	9.70 418	21	9.76 841	29	0.23 159	9.93 577	8	36	
25	9.70 439	22	9.76.870	29	0.23 130	9.93 569	7	35	
26	9.70 461	21	9.76 899	29	0.23 101	9.93 562	8	34	22
27	9.70 482	22	9.76 928	29	0.23 072	9.93 554	7	33	1 2.2
28	9.70 504	21	9.76 957	29	0.23 043	9.93 547	8	32	2 4.4
29	9.70 525	22	9.76 986	29	0 23.014	9.93 539	7	31	3 6.6
30	9.70 547	21	9.77 015	29	0.22 985	9.93 532	7	30	4 8.8
31	9.70 568	22	9.77 044	29	0.22 956	9.93 525	8	29	5 11.0
32	9.70 590	21	9.77 073	28	0.22 927	9.93 517	7	28	6 13.2
33	9.70 611	22	9.77 101	29	0.22 899	9.93 510	8	27	7 15.4
34	9.70 633	21	9.77 130	29	0.22 870	9.93 502	7	26	8 17.6
35	9.70 654	21	9.77 159	29	0.22 841	9.93 495	8	25	9 19.8
36	9.70 675	22	9.77 188	29	0.22 812	9.93 487	7	24	
37	9.70 697	21	9.77 217	29	0.22 783	9.93 480	8	23	
38	9.70 718	21	9.77 246	28	0.22 754	9.93 472	7	22	21
39	9.70 739	22	9.77 274	29	0.22 726	9.93 465	8	21	1 2.1
40	9.70 761	21	9.77 303	29	0.22 697	9.93 457	7	20	2 4.2
41	9.70 782	21	9.77 332	29	0.22 668	9.93 450	8	19	3 6.3
42	9.70 803	21	9.77 361	29	0.22 639	9.93 442	7	18	4 8.4
43	9.70 824	22	9.77 390	28	0.22 610	9.93 435	8	17	5 10.5
44	9.70 846	21	9.77 418	29	0.22 582	9.93 427	7	16	6 12.6
45	9.70 867	21	9.77 447	29	0.22 553	9.93 420	8	15	7 14.7
46	9.70 888	21	9.77 476	29	0.22 524	9.93 412	7	14	8 16.8
47	9.70 909	22	9.77 505	28	0.22 495	9.93 405	8	13	9 18.9
48	9.70 931	21	9.77 533	29	0.22 467	9.93 397	7	12	
49	9.70 952	21	9.77 562	29	0.22 438	9.93 390	8	11	
50	9.70 973	21	9.77 591	28	0.22 409	9.93 382	7	10	8 7
51	9.70 994	21	9.77 619	29	0.22 381	9.93 375	8	9	1 0.8 0.7
52	9.71 015	21	9.77 648	29	0.22 352	9.93 367	7	8	2 1.6 1.4
53	9.71 036	22	9.77 677	29	0.22 323	9.93 360	8	7	3 2.4 2.1
54	9.71 058	21	9.77 706	28	0.22 294	9.93 352	8	6	4 3.2 2.8
55	9.71 079	21	9.77 734	29	0.22 266	9.93 344	7	5	5 4.0 3.5
56	9.71 100	21	9.77 763	28	0.22 237	9.93 337	8	4	6 4.8 4.2
57	9.71 121	21	9.77 791	29	0.22 209	9.93 329	7	3	7 5.6 4.9
58	9.71 142	21	9.77 820	29	0.22 180	9.93 322	8	2	8 6.4 5.6
59	9.71 163	21	9.77 849	28	0.22 151	9.93 314	7	1	9 7.2 6.3
60	9.71 184		9.77 877		0.22 123	9.93 307		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

31°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.71 184		9.77 877		0.22 123	9.93 307		60	
1	9.71 205	21	9.77 906	29	0.22 094	9.93 299	8	59	
2	9.71 226	21	9.77 935	29	0.22 065	9.93 291	8	58	29
3	9.71 247	21	9.77 963	28	0.22 037	9.93 284	7	57	1 2.9
4	9.71 268	21	9.77 992	29	0.22 008	9.93 276	8	56	2 5.8
		21		28			7		3 8.7
5	9.71 289		9.78 020		0.21 980	9.93 269		55	4 11.6
6	9.71 310	21	9.78 049	29	0.21 951	9.93 261	8	54	5 14.5
7	9.71 331	21	9.78 077	28	0.21 923	9.93 253	8	53	6 17.4
8	9.71 352	21	9.78 106	29	0.21 894	9.93 246	7	52	7 20.3
9	9.71 373	21	9.78 135	29	0.21 865	9.93 238	8	51	8 23.2
		20		28			8		9 26.1
10	9.71 393		9.78 163		0.21 837	9.93 230		50	
11	9.71 414	21	9.78 192	29	0.21 808	9.93 223	7	49	
12	9.71 435	21	9.78 220	28	0.21 780	9.93 215	8	48	
13	9.71 456	21	9.78 249	29	0.21 751	9.93 207	8	47	
14	9.71 477	21	9.78 277	28	0.21 723	9.93 200	7	46	28
		21		29			8		1 2.8
15	9.71 498		9.78 306		0.21 694	9.93 192		45	2 5.6
16	9.71 519	21	9.78 334	28	0.21 666	9.93 184	8	44	3 8.4
17	9.71 539	20	9.78 363	29	0.21 637	9.93 177	7	43	4 11.2
18	9.71 560	21	9.78 391	28	0.21 609	9.93 169	8	42	5 14.0
19	9.71 581	21	9.78 419	28	0.21 581	9.93 161	8	41	6 16.8
		21		29			7		7 19.6
20	9.71 602		9.78 448		0.21 552	9.93 154		40	8 22.4
21	9.71 622	20	9.78 476	28	0.21 524	9.93 146	8	39	9 25.2
22	9.71 643	21	9.78 505	29	0.21 495	9.93 138	8	38	
23	9.71 664	21	9.78 533	28	0.21 467	9.93 131	7	37	
24	9.71 685	21	9.78 562	29	0.21 438	9.93 123	8	36	
		20		28			8		
25	9.71 705		9.78 590		0.21 410	9.93 115		35	21
26	9.71 726	21	9.78 618	28	0.21 382	9.93 108	7	34	1 2.1
27	9.71 747	21	9.78 647	29	0.21 353	9.93 100	8	33	2 4.2
28	9.71 767	20	9.78 675	28	0.21 325	9.93 092	8	32	3 6.3
29	9.71 788	21	9.78 704	29	0.21 296	9.93 084	8	31	4 8.4
		21		28			7		5 10.5
30	9.71 809		9.78 732		0.21 268	9.93 077		30	6 12.6
31	9.71 829	20	9.78 760	28	0.21 240	9.93 069	8	29	7 14.7
32	9.71 850	21	9.78 789	29	0.21 211	9.93 061	8	28	8 16.8
33	9.71 870	20	9.78 817	28	0.21 183	9.93 053	8	27	9 18.9
34	9.71 891	21	9.78 845	28	0.21 155	9.93 046	7	26	
		20		29			8		
35	9.71 911		9.78 874		0.21 126	9.93 038		25	
36	9.71 932	21	9.78 902	28	0.21 098	9.93 030	8	24	
37	9.71 952	20	9.78 930	28	0.21 070	9.93 022	8	23	20
38	9.71 973	21	9.78 959	29	0.21 041	9.93 014	8	22	1 2.0
39	9.71 994	21	9.78 987	28	0.21 013	9.93 007	7	21	2 4.0
		20		28			8		3 6.0
40	9.72 014		9.79 015		0.20 985	9.92 999		20	4 8.0
41	9.72 034	20	9.79 043	28	0.20 957	9.92 991	8	19	5 10.0
42	9.72 055	21	9.79 072	29	0.20 928	9.92 983	8	18	6 12.0
43	9.72 075	20	9.79 100	28	0.20 900	9.92 976	7	17	7 14.0
44	9.72 096	21	9.79 128	28	0.20 872	9.92 968	8	16	8 16.0
		20		28			8		9 18.0
45	9.72 116		9.79 156		0.20 844	9.92 960		15	
46	9.72 137	21	9.79 185	29	0.20 815	9.92 952	8	14	
47	9.72 157	20	9.79 213	28	0.20 787	9.92 944	8	13	
48	9.72 177	20	9.79 241	28	0.20 759	9.92 936	8	12	
49	9.72 198	21	9.79 269	28	0.20 731	9.92 929	7	11	
		20		28			8		8 7
50	9.72 218		9.79 297		0.20 703	9.92 921		10	1 0.8 0.7
51	9.72 238	20	9.79 326	29	0.20 674	9.92 913	8	9	2 1.6 1.4
52	9.72 259	21	9.79 354	28	0.20 646	9.92 905	8	8	3 2.4 2.1
53	9.72 279	20	9.79 382	28	0.20 618	9.92 897	8	7	4 3.2 2.8
54	9.72 299	20	9.79 410	28	0.20 590	9.92 889	8	6	5 4.0 3.5
		21		28			8		6 4.8 4.2
55	9.72 320		9.79 438		0.20 562	9.92 881		5	7 5.6 4.9
56	9.72 340	20	9.79 466	28	0.20 534	9.92 874	7	4	8 6.4 5.6
57	9.72 360	20	9.79 495	29	0.20 505	9.92 866	8	3	9 7.2 6.3
58	9.72 381	21	9.79 523	28	0.20 477	9.92 858	8	2	
59	9.72 401	20	9.79 551	28	0.20 449	9.92 850	8	1	
		20		28			8		
60	9.72 421		9.79 579		0.20 421	9.92 842		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

32°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.72 421	20	9.79 579	28	0.20 421	9.92 842	8	60	
1	9.72 441	20	9.79 607	28	0.20 393	9.92 834	8	59	
2	9.72 461	21	9.79 635	28	0.20 365	9.92 826	8	58	
3	9.72 482	20	9.79 663	28	0.20 337	9.92 818	8	57	29 28
4	9.72 502	20	9.79 691	28	0.20 309	9.92 810	7	56	1 2.9 2.8
5	9.72 522	20	9.79 719	28	0.20 281	9.92 803	8	55	2 5.8 5.6
6	9.72 542	20	9.79 747	29	0.20 253	9.92 795	8	54	3 8.7 8.4
7	9.72 562	20	9.79 776	28	0.20 224	9.92 787	8	53	4 11.6 11.2
8	9.72 582	20	9.79 804	28	0.20 196	9.92 779	8	52	5 14.5 14.0
9	9.72 602	20	9.79 832	28	0.20 168	9.92 771	8	51	6 17.4 16.8
10	9.72 622	21	9.79 860	28	0.20 140	9.92 763	8	50	7 20.3 19.6
11	9.72 643	20	9.79 888	28	0.20 112	9.92 755	8	49	8 23.2 22.4
12	9.72 663	20	9.79 916	28	0.20 084	9.92 747	8	48	9 26.1 25.2
13	9.72 683	20	9.79 944	28	0.20 056	9.92 739	8	47	
14	9.72 703	20	9.79 972	28	0.20 028	9.92 731	8	46	27
15	9.72 723	20	9.80 000	28	0.20 000	9.92 723	8	45	1 2.7
16	9.72 743	20	9.80 028	28	0.19 972	9.92 715	8	44	2 5.4
17	9.72 763	20	9.80 056	28	0.19 944	9.92 707	8	43	3 8.1
18	9.72 783	20	9.80 084	28	0.19 916	9.92 699	8	42	4 10.8
19	9.72 803	20	9.80 112	28	0.19 888	9.92 691	8	41	5 13.5
20	9.72 823	20	9.80 140	28	0.19 860	9.92 683	8	40	6 16.2
21	9.72 843	20	9.80 168	27	0.19 832	9.92 675	8	39	7 18.9
22	9.72 863	20	9.80 195	28	0.19 805	9.92 667	8	38	8 21.6
23	9.72 883	19	9.80 223	28	0.19 777	9.92 659	8	37	9 24.3
24	9.72 902	20	9.80 251	28	0.19 749	9.92 651	8	36	
25	9.72 922	20	9.80 279	28	0.19 721	9.92 643	8	35	21 20
26	9.72 942	20	9.80 307	28	0.19 693	9.92 635	8	34	
27	9.72 962	20	9.80 335	28	0.19 665	9.92 627	8	33	1 2.1 2.0
28	9.72 982	20	9.80 363	28	0.19 637	9.92 619	8	32	2 4.2 4.0
29	9.73 002	20	9.80 391	28	0.19 609	9.92 611	8	31	3 6.3 6.0
30	9.73 022	19	9.80 419	28	0.19 581	9.92 603	8	30	4 8.4 8.0
31	9.73 041	20	9.80 447	27	0.19 553	9.92 595	8	29	5 10.5 10.0
32	9.73 061	20	9.80 474	28	0.19 526	9.92 587	8	28	6 12.6 12.0
33	9.73 081	20	9.80 502	28	0.19 498	9.92 579	8	27	7 14.7 14.0
34	9.73 101	20	9.80 530	28	0.19 470	9.92 571	8	26	8 16.8 16.0
35	9.73 121	19	9.80 558	28	0.19 442	9.92 563	8	25	9 18 9 18.0
36	9.73 140	20	9.80 586	28	0.19 414	9.92 555	9	24	
37	9.73 160	20	9.80 614	28	0.19 386	9.92 546	8	23	
38	9.73 180	20	9.80 642	27	0.19 358	9.92 538	8	22	19 9
39	9.73 200	19	9.80 669	28	0.19 331	9.92 530	8	21	1 1.9 0.9
40	9.73 219	20	9.80 697	28	0.19 303	9.92 522	8	20	2 3.8 1.8
41	9.73 239	20	9.80 725	28	0.19 275	9.92 514	8	19	3 5.7 2.7
42	9.73 259	19	9.80 753	28	0.19 247	9.92 506	8	18	4 7.6 3.6
43	9.73 278	20	9.80 781	27	0.19 219	9.92 498	8	17	5 9.5 4.5
44	9.73 298	20	9.80 808	28	0.19 192	9.92 490	8	16	6 11.4 5.4
45	9.73 318	19	9.80 836	28	0.19 164	9.92 482	9	15	7 13.3 6.3
46	9.73 337	20	9.80 864	28	0.19 136	9.92 473	8	14	8 15.2 7.2
47	9.73 357	20	9.80 892	27	0.19 108	9.92 465	8	13	9 17.1 8.1
48	9.73 377	19	9.80 919	28	0.19 081	9.92 457	8	12	
49	9.73 396	20	9.80 947	28	0.19 053	9.92 449	8	11	
50	9.73 416	19	9.80 975	28	0.19 025	9.92 441	8	10	8 7
51	9.73 435	20	9.81 003	27	0.18 997	9.92 433	8	9	1 0.8 0.7
52	9.73 455	19	9.81 030	28	0.18 970	9.92 425	9	8	2 1.6 1.4
53	9.73 474	20	9.81 058	28	0.18 942	9.92 416	8	7	3 2.4 2.1
54	9.73 494	19	9.81 086	27	0.18 914	9.92 408	8	6	4 3.2 2.8
55	9.73 513	20	9.81 113	28	0.18 887	9.92 400	8	5	5 4.0 3.5
56	9.73 533	19	9.81 141	28	0.18 859	9.92 392	8	4	6 4.8 4.2
57	9.73 552	20	9.81 169	27	0.18 831	9.92 384	8	3	7 5.6 4.9
58	9.73 572	19	9.81 196	28	0.18 804	9.92 376	9	2	8 6.4 5.6
59	9.73 591	20	9.81 224	28	0.18 776	9.92 367	8	1	9 7.2 6.3
60	9.73 611		9.81 252		0.18 748	9.92 359		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

33°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.73 611	19	9.81 252	27	0.18 748	9.92 359	8	60	
1	9.73 630	20	9.81 279	28	0.18 721	9.92 351	8	59	
2	9.73 650	19	9.81 307	28	0.18 693	9.92 343	8	58	28 27
3	9.73 669	20	9.81 335	27	0.18 665	9.92 335	9	57	1 2.8 2.7
4	9.73 689	19	9.81 362	28	0.18 638	9.92 326	8	56	2 5.6 5.4
5	9.73 708	19	9.81 390	28	0.18 610	9.92 318	8	55	3 8.4 8.1
6	9.73 727	20	9.81 418	27	0.18 582	9.92 310	8	54	4 11.2 10.8
7	9.73 747	19	9.81 445	28	0.18 555	9.92 302	9	53	5 14.0 13.5
8	9.73 766	19	9.81 473	27	0.18 527	9.92 293	8	52	6 16.8 16.2
9	9.73 785	20	9.81 500	28	0.18 500	9.92 285	8	51	7 19.6 18.9
10	9.73 805	19	9.81 528	28	0.18 472	9.92 277	8	50	8 22.4 21.6
11	9.73 824	19	9.81 556	27	0.18 444	9.92 269	9	49	9 25.2 24.3
12	9.73 843	20	9.81 583	28	0.18 417	9.92 260	8	48	
13	9.73 863	19	9.81 611	27	0.18 389	9.92 252	8	47	
14	9.73 882	19	9.81 638	28	0.18 362	9.92 244	9	46	20
15	9.73 901	20	9.81 666	27	0.18 334	9.92 235	8	45	1 2.0
16	9.73 921	19	9.81 693	28	0.18 307	9.92 227	8	44	2 4.0
17	9.73 940	19	9.81 721	27	0.18 279	9.92 219	8	43	3 6.0
18	9.73 959	19	9.81 748	28	0.18 252	9.92 211	9	42	4 8.0
19	9.73 978	19	9.81 776	27	0.18 224	9.92 202	8	41	5 10.0
20	9.73 997	20	9.81 803	28	0.18 197	9.92 194	8	40	6 12.0
21	9.74 017	19	9.81 831	27	0.18 169	9.92 186	9	39	7 14.0
22	9.74 036	19	9.81 858	28	0.18 142	9.92 177	8	38	8 16.0
23	9.74 055	19	9.81 886	27	0.18 114	9.92 169	8	37	9 18.0
24	9.74 074	19	9.81 913	28	0.18 087	9.92 161	9	36	
25	9.74 093	20	9.81 941	27	0.18 059	9.92 152	8	35	19
26	9.74 113	19	9.81 968	28	0.18 032	9.92 144	8	34	1 1.9
27	9.74 132	19	9.81 996	27	0.18 004	9.92 136	9	33	2 3.8
28	9.74 151	19	9.82 023	28	0.17 977	9.92 127	8	32	3 5.7
29	9.74 170	19	9.82 051	27	0.17 949	9.92 119	8	31	4 7.6
30	9.74 189	19	9.82 078	28	0.17 922	9.92 111	9	30	5 9.5
31	9.74 208	19	9.82 106	27	0.17 894	9.92 102	8	29	6 11.4
32	9.74 227	19	9.82 133	28	0.17 867	9.92 094	8	28	7 13.3
33	9.74 246	19	9.82 161	27	0.17 839	9.92 086	9	27	8 15.2
34	9.74 265	19	9.82 188	27	0.17 812	9.92 077	8	26	9 17.1
35	9.74 284	19	9.82 215	28	0.17 785	9.92 069	9	25	
36	9.74 303	19	9.82 243	27	0.17 757	9.92 060	8	24	
37	9.74 322	19	9.82 270	28	0.17 730	9.92 052	8	23	
38	9.74 341	19	9.82 298	27	0.17 702	9.92 044	9	22	18
39	9.74 360	19	9.82 325	27	0.17 675	9.92 035	8	21	1 1.8
40	9.74 379	19	9.82 352	28	0.17 648	9.92 027	9	20	2 3.6
41	9.74 398	19	9.82 380	27	0.17 620	9.92 018	8	19	3 5.4
42	9.74 417	19	9.82 407	28	0.17 593	9.92 010	8	18	4 7.2
43	9.74 436	19	9.82 435	27	0.17 565	9.92 002	9	17	5 9.0
44	9.74 455	19	9.82 462	27	0.17 538	9.91 993	8	16	6 10.8
45	9.74 474	19	9.82 489	28	0.17 511	9.91 985	9	15	7 12.6
46	9.74 493	19	9.82 517	27	0.17 483	9.91 976	8	14	8 14.4
47	9.74 512	19	9.82 544	27	0.17 456	9.91 968	9	13	9 16.2
48	9.74 531	18	9.82 571	28	0.17 429	9.91 959	8	12	
49	9.74 549	19	9.82 599	27	0.17 401	9.91 951	9	11	
50	9.74 568	19	9.82 626	27	0.17 374	9.91 942	8	10	9 8
51	9.74 587	19	9.82 653	28	0.17 347	9.91 934	9	9	1 0.9 0.8
52	9.74 606	19	9.82 681	27	0.17 319	9.91 925	8	8	2 1.8 1.6
53	9.74 625	19	9.82 708	27	0.17 292	9.91 917	9	7	3 2.7 2.4
54	9.74 644	18	9.82 735	27	0.17 265	9.91 908	8	6	4 3.6 3.2
55	9.74 662	19	9.82 762	28	0.17 238	9.91 900	9	5	5 4.5 4.0
56	9.74 681	19	9.82 790	27	0.17 210	9.91 891	8	4	6 5.4 4.8
57	9.74 700	19	9.82 817	27	0.17 183	9.91 883	9	3	7 6.3 5.6
58	9.74 719	18	9.82 844	27	0.17 156	9.91 874	8	2	8 7.2 6.4
59	9.74 737	19	9.82 871	28	0.17 129	9.91 866	9	1	9 8.1 7.2
60	9.74 756		9.82 899		0.17 101	9.91 857		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

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′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.74 756	19	9.82 899	27	0.17 101	9.91 857	8	60	
1	9.74 775	19	9.82 926	27	0.17 074	9.91 849	9	59	
2	9.74 794	18	9.82 953	27	0.17 047	9.91 840	8	58	
3	9.74 812	19	9.82 980	28	0.17 020	9.91 832	9	57	28 27
4	9.74 831	19	9.83 008	27	0.16 992	9.91 823	8	56	1 2.8 2.7
5	9.74 850	18	9.83 035	27	0.16 956	9.91 815	9	55	2 5.6 5.4
6	9.74 868	19	9.83 062	27	0.16 938	9.91 806	8	54	3 8.4 8.1
7	9.74 887	19	9.83 089	28	0.16 911	9.91 798	9	53	4 11.2 10.8
8	9.74 906	18	9.83 117	27	0.16 883	9.91 789	8	52	5 14.0 13.5
9	9.74 924	19	9.83 144	27	0.16 856	9.91 781	9	51	6 16.8 16.2
10	9.74 943	18	9.83 171	27	0.16 829	9.91 772	9	50	7 19.6 18.9
11	9.74 961	19	9.83 198	27	0.16 802	9.91 763	8	49	8 22.4 21.6
12	9.74 980	19	9.83 225	27	0.16 775	9.91 755	9	48	9 25.3 24.3
13	9.74 999	18	9.83 252	28	0.16 748	9.91 746	8	47	
14	9.75 017	19	9.83 280	27	0.16 720	9.91 738	9	46	26
15	9.75 036	18	9.83 307	27	0.16 693	9.91 729	9	45	1 2.6
16	9.75 054	19	9.83 334	27	0.16 666	9.91 720	8	44	2 5.2
17	9.75 073	18	9.83 361	27	0.16 639	9.91 712	9	43	3 7.8
18	9.75 091	19	9.83 388	27	0.16 612	9.91 703	8	42	4 10.4
19	9.75 110	18	9.83 415	27	0.16 585	9.91 695	9	41	5 13.0
20	9.75 128	19	9.83 442	28	0.16 558	9.91 686	9	40	6 15.6
21	9.75 147	18	9.83 470	27	0.16 530	9.91 677	8	39	7 18.2
22	9.75 165	19	9.83 497	27	0.16 503	9.91 669	9	38	8 20.8
23	9.75 184	18	9.83 524	27	0.16 476	9.91 660	9	37	9 23.4
24	9.75 202	19	9.83 551	27	0.16 449	9.91 651	9	36	
25	9.75 221	18	9.83 578	27	0.16 422	9.91 643	9	35	
26	9.75 239	19	9.83 605	27	0.16 395	9.91 634	9	34	19
27	9.75 258	18	9.83 632	27	0.16 368	9.91 625	8	33	
28	9.75 276	18	9.83 659	27	0.16 341	9.91 617	9	32	1 1.9
29	9.75 294	19	9.83 686	27	0.16 314	9.91 608	9	31	2 3.8
30	9.75 313	18	9.83 713	27	0.16 287	9.91 599	8	30	3 5.7
31	9.75 331	19	9.83 740	28	0.16 260	9.91 591	9	29	4 7.6
32	9.75 350	18	9.83 768	27	0.16 232	9.91 582	9	28	5 9.5
33	9.75 368	18	9.83 795	27	0.16 205	9.91 573	8	27	6 11.4
34	9.75 386	19	9.83 822	27	0.16 178	9.91 565	9	26	7 13.3
35	9.75 405	18	9.83 849	27	0.16 151	9.91 556	9	25	8 15.2
36	9.75 423	18	9.83 876	27	0.16 124	9.91 547	9	24	9 17.1
37	9.75 441	18	9.83 903	27	0.16 097	9.91 538	8	23	
38	9.75 459	19	9.83 930	27	0.16 070	9.91 530	9	22	
39	9.75 478	18	9.83 957	27	0.16 043	9.91 521	9	21	18
40	9.75 496	18	9.83 984	27	0.16 016	9.91 512	8	20	1 1.8
41	9.75 514	19	9.84 011	27	0.15 989	9.91 504	9	19	2 3.6
42	9.75 533	18	9.84 038	27	0.15 962	9.91 495	9	18	3 5.4
43	9.75 551	18	9.84 065	27	0.15 935	9.91 486	9	17	4 7.2
44	9.75 569	18	9.84 092	27	0.15 908	9.91.477	9	16	5 9.0
45	9.75 587	18	9.84 119	27	0.15 881	9.91 469	9	15	6 10.8
46	9.75 605	19	9.74 146	27	0.15 854	9.91 460	9	14	7 12.6
47	9.75 624	18	9.84 173	27	0.15 827	9.91 451	9	13	8 14.4
48	9.75 642	18	9.84 200	27	0.15 800	9.91 442	9	12	9 16.2
49	9.75 660	18	9.84 227	27	0.15 773	9.91 433	9	11	
50	9.75 678	18	9.84 254	26	0.15 746	9.91 425	9	10	9 8
51	9.75 696	18	9.84 280	27	0.15 720	9.91 416	9	9	1 0.9 0.8
52	9.75 714	19	9.84 307	27	0.15 693	9.91 407	9	8	2 1.8 1.6
53	9.75 733	18	9.84 334	27	0.15 666	9.91 398	9	7	3 2.7 2.4
54	9.75 751	18	9.84 361	27	0.15 639	9.91 389	9	6	4 3.6 3.2
55	9.75 769	18	9.84 388	27	0.15 612	9.91 381	9	5	5 4.5 4.0
56	9.75 787	18	9.84 415	27	0.15 585	9.91 372	9	4	6 5.4 4.8
57	9.75 805	18	9.84 442	27	0.15 558	9.91 363	9	3	7 6.3 5.6
58	9.75 823	18	9.84 469	27	0.15 531	9.91 354	9	2	8 7.2 6.4
59	9.75 841	18	9.84 496	27	0.15 504	9.91 345	9	1	9 8.1 7.2
60	9.75 859		9.84 523		0.15 477	9.91 336		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

35°									
′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.75 859	18	9.84 523	27	0.15 477	9.91 336	8	60	
1	9.75 877	18	9.84 550	26	0.15 450	9.91 328	9	59	
2	9.75 895	18	9.84 576	27	0.15 424	9.91 319	9	58	
3	9.75 913	18	9.84 603	27	0.15 397	9.91 310	9	57	27 26
4	9.75 931	18	9.84 630	27	0.15 370	9.91 301	9	56	1 2.7 2.6
5	9.75 949	18	9.84 657	27	0.15 343	9.91 292	9	55	2 5.4 5.2
6	9.75 967	18	9.84 684	27	0.15 316	9.91 283	9	54	3 8.1 7.8
7	9.75 985	18	9.84 711	27	0.15 289	9.91 274	8	53	4 10.8 10.4
8	9.76 003	18	9.84 738	26	0.15 262	9.91 266	9	52	5 13.5 13.0
9	9.76 021	18	9.84 764	27	0.15 236	9.91 257	9	51	6 16.2 15.6
10	9.76 039	18	9.84 791	27	0.15 209	9.91 248	9	50	7 18.9 18.2
11	9.76 057	18	9.84 818	27	0.15 182	9.91 239	9	49	8 21.6 20.8
12	9.76 075	18	9.84 845	27	0.15 155	9.91 230	9	48	9 24.3 23.4
13	9.76 093	18	9.84 872	27	0.15 128	9.91 221	9	47	
14	9.76 111	18	9.84 899	26	0.15 101	9.91 212	9	46	
15	9.76 129	17	9.84 925	27	0.15 075	9.91 203	9	45	18
16	9.76 146	18	9.84 952	27	0.15 048	9.91 194	9	44	1 1.8
17	9.76 164	18	9.84 979	27	0.15 021	9.91 185	9	43	2 3.6
18	9.76 182	18	9.85 006	27	0.14 994	9.91 176	9	42	3 5.4
19	9.76 200	18	9.85 033	26	0.14 967	9.91 167	9	41	4 7.2
20	9.76 218	18	9.85 059	27	0.14 941	9.91 158	9	40	5 9.0
21	9.76 236	17	9.85 086	27	0.14 914	9.91 149	8	39	6 10.8
22	9.76 253	18	9.85 113	27	0.14 887	9.91 141	9	38	7 12.6
23	9.76 271	18	9.85 140	26	0.14 860	9.91 132	9	37	8 14.4
24	9.76 289	18	9.85 166	27	0.14 834	9.91 123	9	36	9 16.2
25	9.76 307	17	9.85 193	27	0.14 807	9.91 114	9	35	
26	9.76 324	18	9.85 220	27	0.14 780	9.91 105	9	34	17
27	9.76 342	18	9.85 247	26	0.14 753	9.91 096	9	33	
28	9.76 360	18	9.85 273	27	0.14 727	9.91 087	9	32	1 1.7
29	9.76 378	17	9.85 300	27	0.14 700	9.91 078	9	31	2 3.4
30	9.76 395	18	9.85 327	27	0.14 673	9.91 069	9	30	3 5.1
31	9.76 413	18	9.85 354	26	0.14 646	9.91 060	9	29	4 6.8
32	9.76 431	17	9.85 380	27	0.14 620	9.91 051	9	28	5 8.5
33	9.76 448	18	9.85 407	27	0.14 593	9.91 042	9	27	6 10.2
34	9.76 466	18	9.85 434	26	0.14 566	9.91 033	10	26	7 11.9
35	9.76 484	17	9.85 460	27	0.14 540	9.91 023	9	25	8 13.6
36	9.76 501	18	9.85 487	27	0.14 513	9.91 014	9	24	9 15.3
37	9.76 519	18	9.85 514	26	0.14 486	9.91 005	9	23	
38	9.76 537	17	9.85 540	27	0.14 460	9.90 996	9	22	
39	9.76 554	18	9.85 567	27	0.14 433	9.90 987	9	21	10
40	9.76 572	18	9.85 594	26	0.14 406	9.90 978	9	20	1 1.0
41	9.76 590	17	9.85 620	27	0.14 380	9.90 969	9	19	2 2.0
42	9.76 607	18	9.85 647	27	0.14 353	9.90 960	9	18	3 3.0
43	9.76 625	17	9.85 674	26	0.14 326	9.90 951	9	17	4 4.0
44	9.76 642	18	9.85 700	27	0.14 300	9.90 942	9	16	5 5.0
45	9.76 660	17	9.85 727	27	0.14 273	9.90 933	9	15	6 6.0
46	9.76 677	18	9.85 754	26	0.14 246	9.90 924	9	14	7 7.0
47	9.76 695	17	9.85 780	27	0.14 220	9.90 915	9	13	8 8.0
48	9.76 712	18	9.85 807	27	0.14 193	9.90 906	10	12	9 9.0
49	9.76 730	17	9.85 834	26	0.14 166	9.90 896	9	11	
50	9.76 747	18	9.85 860	27	0.14 140	9.90 887	9	10	9 8
51	9.76 765	17	9.85 887	26	0.14 113	9.90 878	9	9	1 0.9 0.8
52	9.76 782	18	9.85 913	27	0.14 087	9.90 869	9	8	2 1.8 1.6
53	9.76 800	17	9.85 940	27	0.14 060	9.90 860	9	7	3 2.7 2.4
54	9.76 817	18	9.85 967	26	0.14 033	9.90 851	9	6	4 3.6 3.2
55	9.76 835	17	9.85 993	27	0.14 007	9.90 842	10	5	5 4.5 4.0
56	9.76 852	18	9.86 020	26	0.13 980	9.90 832	9	4	6 5.4 4.8
57	9.76 870	17	9.86 046	27	0.13 954	9.90 823	9	3	7 6.3 5.6
58	9.76 887	17	9.86 073	27	0.13 927	9.90 814	9	2	8 7.2 6.4
59	9.76 904	18	9.86 100	26	0.13 900	9.90 805	9	1	9 8.1 7.2
60	9.76 922		9.86 126		0.13 874	9.90 796		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
54°									

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TABLE II.—*Common logarithms of circular functions*—Continued

36°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.76 922	17	9.86 126	27	0.13 874	9.90 796	9	60	
1	9.76 939	18	9.86 153	26	0.13 847	9.90 787	10	59	
2	9.76 957	17	9.86 179	27	0.13 821	9.90 777	9	58	27 26
3	9.76 974	17	9.86 206	26	0.13 794	9.90 768	9	57	1 2.7 2.6
4	9.76 991	18	9.86 232	27	0.13 768	9.90 759	9	56	2 5.4 5.2
5	9.77 009	17	9.86 259	26	0.13 741	9.90 750	9	55	3 8.1 7.8
6	9.77 026	17	9.86 285	27	0.13 715	9.90 741	10	54	4 10.8 10.4
7	9.77 043	18	9.86 312	26	0.13 688	9.90 731	9	53	5 13.5 13.0
8	9.77 061	17	9.86 338	27	0.13 662	9.90 722	9	52	6 16.2 15.6
9	9.77 078	17	9.86 365	27	0.13 635	9.90 713	9	51	7 18.9 18.2
									8 21.6 20.8
10	9.77 095	17	9.86 392	26	0.13 608	9.90 704	10	50	9 24.3 23.4
11	9.77 112	18	9.86 418	27	0.13 582	9.90 694	9	49	
12	9.77 130	17	9.86 445	26	0.13 555	9.90 685	9	48	
13	9.77 147	17	9.86 471	27	0.13 529	9.90 676	9	47	
14	9.77 164	17	9.86 498	26	0.13 502	9.90 667	10	46	18
15	9.77 181	18	9.86 524	27	0.13 476	9.90 657	9	45	1 1.8
16	9.77 199	17	9.86 551	26	0.13 449	9.90 648	9	44	2 3.6
17	9.77 216	17	9.86 577	26	0.13 423	9.90 639	9	43	3 5.4
18	9.77 233	17	9.86 603	27	0.13 397	9.90 630	10	42	4 7.2
19	9.77 250	18	9.86 630	26	0.13 370	9.90 620	9	41	5 9.0
									6 10.8
20	9.77 268	17	9.86 656	27	0.13 344	9.90 611	9	40	7 12.6
21	9.77 285	17	9.86 683	26	0.13 317	9.90 602	10	39	8 14.4
22	9.77 302	17	9.86 709	27	0.13 291	9.90 592	9	38	9 16.2
23	9.77 319	17	9.86 736	26	0.13 264	9.90 583	9	37	
24	9.77 336	17	9.86 762	27	0.13 238	9.90 574	9	36	
25	9.77 353	17	9.86 789	26	0.13 211	9.90 565	10	35	17
26	9.77 370	17	9.86 815	27	0.13 185	9.90 555	9	34	
27	9.77 387	18	9.86 842	26	0.13 158	9.90 546	9	33	1 1.7
28	9.77 405	17	9.86 868	26	0.13 132	9.90 537	10	32	2 3.4
29	9.77 422	17	9.86 894	27	0.13 106	9.90 527	9	31	3 5.1
									4 6.8
30	9.77 439	17	9.86 921	26	0.13 079	9.90 518	9	30	5 8.5
31	9.77 456	17	9.86 947	27	0.13 053	9.90 509	10	29	6 10.2
32	9.77 473	17	9.86 974	26	0.13 026	9.90 499	9	28	7 11.9
33	9.77 490	17	9.87 000	27	0.13 000	9.90 490	10	27	8 13.6
34	9.77 507	17	9.87 027	26	0.12 973	9.90 480	9	26	9 15.3
35	9.77 524	17	9.87 053	26	0.12 947	9.90 471	9	25	
36	9.77 541	17	9.87 079	27	0.12 921	9.90 462	10	24	
37	9.77 558	17	9.87 106	26	0.12 894	9.90 452	9	23	16
38	9.77 575	17	9.87 132	26	0.12 868	9.90 443	9	22	
39	9.77 592	17	9.87 158	27	0.12 842	9.90 434	10	21	1 1.6
									2 3.2
40	9.77 609	17	9.87 185	26	0.12 815	9.90 424	9	20	3 4.8
41	9.77 626	17	9.87 211	27	0.12 789	9.90 415	10	19	4 6.4
42	9.77 643	17	9.87 238	26	0.12 762	9.90 405	9	18	5 8.0
43	9.77 660	17	9.87 264	26	0.12 736	9.90 396	10	17	6 9.6
44	9.77 677	17	9.87 290	27	0.12 710	9.90 386	9	16	7 11.2
									8 12.8
45	9.77 694	17	9.87 317	26	0.12 683	9.90 377	9	15	9 14.4
46	9.77 711	17	9.87 343	26	0.12 657	9.90 368	10	14	
47	9.77 728	16	9.87 369	27	0.12 631	9.90 358	9	13	
48	9.77 744	17	9.87 396	26	0.12 604	9.90 349	10	12	
49	9.77 761	17	9.87 422	26	0.12 578	9.90 339	9	11	10 9
50	9.77 778	17	9.87 448	27	0.12 552	9.90 330	10	10	1 1.0 0.9
51	9.77 795	17	9.87 475	26	0.12 525	9.90 320	9	9	2 2.0 1.8
52	9.77 812	17	9.87 501	26	0.12 499	9.90 311	10	8	3 3.0 2.7
53	9.77 829	17	9.87 527	27	0.12 473	9.90 301	9	7	4 4.0 3.6
54	9.77 846	16	9.87 554	26	0.12 446	9.90 292	10	6	5 5.0 4.5
									6 6.0 5.4
55	9.77 862	17	9.87 580	26	0.12 420	9.90 282	9	5	7 7.0 6.3
56	9.77 879	17	9.87 606	27	0.12 394	9.90 273	10	4	8 8.0 7.2
57	9.77 896	17	9.87 633	26	0.12 367	9.90 263	9	3	9 9.0 8.1
58	9.77 913	17	9.87 659	26	0.12 341	9.90 254	10	2	
59	9.77 930	16	9.87 685	26	0.12 315	9.90 244	9	1	
60	9.77 946		9.87 711		0.12 289	9.90 235		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

37°								
′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.	
0	9.77 946	17	9.87 711	27	0.12 289	9.90 235	10	60
1	9.77 963	17	9.87 738	26	0.12 262	9.90 225	9	59
2	9.77 980	17	9.87 764	26	0.12 236	9.90 216	10	58
3	9.77 997	16	9.87 790	27	0.12 210	9.90 206	9	57
4	9.78 013	17	9.87 817	26	0.12 183	9.90 197	10	56
5	9.78 030	17	9.87 843	26	0.12 157	9.90 187	9	55
6	9.78 047	16	9.87 869	26	0.12 131	9.90 178	10	54
7	9.78 063	17	9.87 895	27	0.12 105	9.90 168	9	53
8	9.78 080	17	9.87 922	26	0.12 078	9.90 159	10	52
9	9.78 097	16	9.87 948	26	0.12 052	9.90 149	10	51
10	9.78 113	17	9.87 974	26	0.12 026	9.90 139	9	50
11	9.78 130	17	9.88 000	27	0.12 000	9.90 130	10	49
12	9.78 147	16	9.88 027	26	0.11 973	9.90 120	9	48
13	9.78 163	17	9.88 053	26	0.11 947	9.90 111	10	47
14	9.78 180	17	9.88 079	26	0.11 921	9.90 101	10	46
15	9.78 197	16	9.88 105	26	0.11 895	9.90 091	9	45
16	9.78 213	17	9.88 131	27	0.11 869	9.90 082	10	44
17	9.78 230	16	9.88 158	26	0.11 842	9.90 072	9	43
18	9.78 246	17	9.88 184	26	0.11 816	9.90 063	10	42
19	9.78 263	17	9.88 210	26	0.11 790	9.90 053	10	41
20	9.78 280	16	9.88 236	26	0.11 764	9.90 043	9	40
21	9.78 296	17	9.88 262	27	0.11 738	9.90 034	10	39
22	9.78 313	16	9.88 289	26	0.11 711	9.90 024	10	38
23	9.78 329	17	9.88 315	26	0.11 685	9.90 014	9	37
24	9.78 346	16	9.88 341	26	0.11 659	9.90 005	10	36
25	9.78 362	17	9.88 367	26	0.11 633	9.89 995	10	35
26	9.78 379	16	9.88 393	27	0.11 607	9.89 985	9	34
27	9.78 395	17	9.88 420	26	0.11 580	9.89 976	10	33
28	9.78 412	16	9.88 446	26	0.11 554	9.89 966	10	32
29	9.78 428	17	9.88 472	26	0.11 528	9.89 956	9	31
30	9.78 445	16	9.88 498	26	0.11 502	9.89 947	10	30
31	9.78 461	17	9.88 524	26	0.11 476	9.89 937	10	29
32	9.78 478	16	9.88 550	27	0.11 450	9.89 927	9	28
33	9.78 494	16	9.88 577	26	0.11 423	9.89 918	10	27
34	9.78 510	17	9.88 603	26	0.11 397	9.89 908	10	26
35	9.78 527	16	9.88 629	26	0.11 371	9.89 898	10	25
36	9.78 543	17	9.88 655	26	0.11 345	9.89 888	9	24
37	9.78 560	16	9.88 681	26	0.11 319	9.89 879	10	23
38	9.78 576	16	9.88 707	26	0.11 293	9.89 869	10	22
39	9.78 592	17	9.88 733	26	0.11 267	9.89 859	10	21
40	9.78 609	16	9.88 759	27	0.11 241	9.89 849	9	20
41	9.78 625	17	9.88 786	26	0.11 214	9.89 840	10	19
42	9.78 642	16	9.88 812	26	0.11 188	9.89 830	10	18
43	9.78 658	16	9.88 838	26	0.11 162	9.89 820	10	17
44	9.78 674	17	9.88 864	26	0.11 136	9.89 810	9	16
45	9.78 691	16	9.88 890	26	0.11 110	9.89 801	10	15
46	9.78 707	16	9.88 916	26	0.11 084	9.89 791	10	14
47	9.78 723	16	9.88 942	26	0.11 058	9.89 781	10	13
48	9.78 739	17	9.88 968	26	0.11 032	9.89 771	10	12
49	9.78 756	16	9.88 994	26	0.11 006	9.89 761	9	11
50	9.78 772	16	9.89 020	26	0.10 980	9.89 752	10	10
51	9.78 788	17	9.89 046	27	0.10 954	9.89 742	10	9
52	9.78 805	16	9.89 073	26	0.10 927	9.89 732	10	8
53	9.78 821	16	9.89 099	26	0.10 901	9.89 722	10	7
54	9.78 837	16	9.89 125	26	0.10 875	9.89 712	10	6
55	9.78 853	16	9.89 151	26	0.10 849	9.89 702	9	5
56	9.78 869	17	9.89 177	26	0.10 823	9.89 693	10	4
57	9.78 886	16	9.89 203	26	0.10 797	9.89 683	10	3
58	9.78 902	16	9.89 229	26	0.10 771	9.89 673	10	2
59	9.78 918	16	9.89 255	26	0.10 745	9.89 663	10	1
60	9.78 934		9.89 281		0.10 719	9.89 653		0
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′

Prop. Pts.			
	27		
1	2.7		
2	5.4		
3	8.1		
4	10.8		
5	13.5		
6	16.2		
7	18.9		
8	21.6		
9	24.3		
	26		
1	2.6		
2	5.2		
3	7.8		
4	10.4		
5	13.0		
6	15.6		
7	18.2		
8	20.8		
9	23.4		
	17		
1	1.7		
2	3.4		
3	5.1		
4	6.8		
5	8.5		
6	10.2		
7	11.9		
8	13.6		
9	15.3		
	16		
1	1.6		
2	3.2		
3	4.8		
4	6.4		
5	8.0		
6	9.6		
7	11.2		
8	12.8		
9	14.4		
	10	9	
1	1.0	0.9	
2	2.0	1.8	
3	3.0	2.7	
4	4.0	3.6	
5	5.0	4.5	
6	6.0	5.4	
7	7.0	6.3	
8	8.0	7.2	
9	9.0	8.1	

Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

38°									
′	L. Sin.	d.	L Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.78 934		9 89 281		0.10 719	9.89 653		60	
1	9.78 950	16	9.89 307	26	0.10 693	9.89 643	10	59	
2	9.78 967	17	9.89 333	26	0.10 667	9.89 633	10	58	
3	9.78 983	16	9.89 359	26	0.10 641	9.89 624	10	57	
4	9.78 999	16	9.89 385	26	0.10 61$\bar{5}$	9.89 614	10	56	26 25
5	9.79 01$\bar{5}$	16	9.89 411	26	0.10 589	9.89 604	10	55	1 2.6 2.5
6	9.79 031	16	9.89 437	26	0.10 563	9.89 594	10	54	2 5.2 5.0
7	9.79 047	16	9.89 463	26	0.10 537	9.89 584	10	53	3 7.8 7.5
8	9.79 063	16	9.89 489	26	0.10 511	9.89 574	10	52	4 10.4 10.0
9	9.79 079	16	9.89 515	26	0.10 48$\bar{5}$	9.89 564	10	51	5 13.0 12.5
10	9.79 095		9.89 541		0.10 459	9.89 554		50	6 15.6 15.0
11	9.79 111	16	9.89 567	26	0.10 433	9.89 544	10	49	7 18.2 17.5
12	9.79 128	17	9.89 593	26	0.10 407	9.89 534	10	48	8 20.8 20.0
13	9.79 144	16	9.89 619	26	0.10 381	9.89 524	10	47	9 23.4 22.5
14	9.79 160	16	9.89 645	26	0.10 35$\bar{5}$	9.89 514	10	46	
15	9.79 176		9.89 671		0.10 329	9.89 504		45	17
16	9.79 192	16	9.89 697	26	0.10 303	9.89 49$\bar{5}$	9	44	1 1.7
17	9.79 208	16	9.89 723	26	0.10 277	9.80 48$\bar{5}$	10	43	2 3.4
18	9.79 224	16	9.89 749	26	0.10 251	9.89 47$\bar{5}$	10	42	3 5.1
19	9.79 240	16	9.89 775	26	0.10 22$\bar{5}$	9.89 46$\bar{5}$	10	41	4 6.8
20	9.79 256		9.89 801		0.10 199	9.89 45$\bar{5}$		40	5 8.5
21	9.79 272	16	9.89 827	26	0.10 173	9.89 44$\bar{5}$	10	39	6 10.2
22	9.79 288	16	9.89 853	26	0.10 147	9.89 43$\bar{5}$	10	38	7 11.9
23	9.79 304	16	9.89 879	26	0.10 121	9.89 42$\bar{5}$	10	37	8 13.6
24	9.79 319	15	9.89 90$\bar{5}$	26	0.10 095	9.89 41$\bar{5}$	10	36	9 15.3
25	9.79 335		9.89 931		0.10 069	9.89 40$\bar{5}$		35	
26	9.79 351	16	9.89 957	26	0.10 043	9.89 39$\bar{5}$	10	34	16 15
27	9.79 367	16	9.89 983	26	0.10 017	9.89 38$\bar{5}$	10	33	1 1.6 1.5
28	9.79 383	16	9.90 009	26	0.09 991	9.89 37$\bar{5}$	11	32	2 3.2 3.0
29	9.79 399	16	9.90 03$\bar{5}$	26	0.09 965	9.89 364	10	31	3 1.8 4.5
30	9.79 41$\bar{5}$		9.90 061		0.09 939	9.89 354		30	4 6.4 6.0
31	9.79 431	16	9.90 086	25	0.09 914	9.89 344	10	29	5 8.0 7.5
32	9.79 447	16	9.90 112	26	0.09 888	9.89 334	10	28	6 9.6 9.0
33	9.79 463	16	9.90 138	26	0.09 862	9.89 324	10	27	7 11.2 10.5
34	9.79 478	15	9.90 164	26	0.09 836	9.89 314	10	26	8 12.8 12.0
35	9.79 494	16	9.90 190	26	0.09 810	9.89 304	10	25	9 14.4 13.5
36	9.79 510	16	9.90 216	26	0.09 784	9.89 294	10	24	
37	9.79 526	16	9.90 242	26	0.09 758	9.89 284	10	23	
38	9.79 542	16	9.90 268	26	0.09 732	9.89 274	10	22	
39	9.79 558	15	9.90 294	26	0.09 706	9.89 264	10	21	11
40	9.79 573	16	9.90 320	26	0.09 680	9.89 254	10	20	1 1.1
41	9.79 589	16	9.90 346	25	0.09 654	9.89 244	11	19	2 2.2
42	9.79 60$\bar{5}$	16	9.90 371	26	0.09 629	9.89 233	10	18	3 3.3
43	9.79 621	15	9.90 397	26	0.09 603	9.89 223	10	17	4 4.4
44	9.79 636	16	9.90 423	26	0.09 577	9.89 213	10	16	5 5.5
45	9.79 652		9.90 449		0.09 551	9.89 203		15	6 6.6
46	9.79 668	16	9.90 47$\bar{5}$	26	0.09 525	9.89 193	10	14	7 7.7
47	9.79 684	16	9.90 501	26	0.09 499	9.89 183	10	13	8 8.8
48	9.79 699	15	9.90 527	26	0.09 473	9.89 173	10	12	9 9.9
49	9.79 715	16	9.90 553	26	0.09 447	9.89 162	11	11	
50	9.79 731		9.90 578	25	0.09 422	9.89 152	10	10	10 9
51	9.79 746	15	9.90 604	26	0.09 396	9.89 142	10	9	1 1.0 0.9
52	9.79 762	16	9.90 630	26	0.09 370	9.89 132	10	8	2 2.0 1.8
53	9.79 778	16	9.90 656	26	0.09 344	9.89 122	10	7	3 3.0 2.7
54	9.79 793	15	9.90 682	26	0.09 318	9.89 112	10	6	4 4.0 3.6
55	9.79 809	16	9.90 708	26	0.09.292	9.89 101	11	5	5 5.0 4.5
56	9.79 82$\bar{5}$	15	9.90 734	25	0.09 266	9.89 091	10	4	6 6.0 5.4
57	9.79 840	16	9.90 759	26	0.09 241	9.89 081	10	3	7 7.0 6.3
58	9.79 856	16	9.90 785	26	0.09 21$\bar{5}$	9.89 071	10	2	8 8.0 7.2
59	9.79 872	15	9.90 811	26	0.09 189	9.89 060	11	1	9 9.0 8.1
60	9.79 887		9.90 837		0.09 163	9.89 050	10	0	
	L. Cos.	d.	L Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
51°									

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TABLE II.—*Common logarithms of circular functions*—Continued

39°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.79 887	16	9.90 837	26	0.09 163	9.89 050	10	60	
1	9.79 903	15	9.90 863	26	0.09 137	9.89 040	10	59	
2	9.79 918	16	9.90 889	25	0.09 111	9.89 030	10	58	
3	9.79 934	16	9.90 914	26	0.09 086	9.89 020	11	57	26
4	9.79 950	15	9.90 940	26	0.09 060	9.89 009	10	56	1 2.6
									2 5.2
5	9.79 965	16	9.90 966	26	0.09 034	9.88 999	10	55	3 7.8
6	9.79 981	15	9.90 992	26	0.09 008	9.88 989	11	54	4 10.4
7	9.79 996	16	9.91 018	25	0.08 982	9.88 978	10	53	5 13.0
8	9.80 012	15	9.91 043	26	0.08 957	9.88 968	10	52	6 15.6
9	9.80 027	16	9.91 069	26	0.08 931	9.88 958	10	51	7 18.2
									8 20.8
10	9.80 043	15	9.91 095	26	0.08 905	9.88 948	11	50	9 23.4
11	9.80 058	16	9.91 121	26	0.08 879	9.88 937	10	49	
12	9.80 074	15	9.91 147	25	0.08 853	9.88 927	10	48	
13	9.80 089	16	9.91 172	26	0.08 828	9.88 917	11	47	
14	9.80 105	15	9.91 198	26	0.08 802	9.88 906	10	46	25
15	9.80 120	16	9.91 224	26	0.08 776	9.88 896	10	45	1 2.5
16	9.80 136	15	9.91 250	26	0.08 750	9.88 886	11	44	2 5.0
17	9.80 151	15	9.91 276	25	0.08 724	9.88 875	10	43	3 7.5
18	9.80 166	16	9.91 301	26	0.08 699	9.88 865	10	42	4 10.8
19	9.80 182	15	9.91 327	26	0.08 673	9.88 855	11	41	5 12.5
									6 15.0
20	9.80 197	16	9.91 353	26	0.08 647	9.88 844	10	40	7 17.5
21	9.80 213	15	9.91 379	25	0.08 621	9.88 834	10	39	8 20.0
22	9.80 228	16	9.91 404	26	0.08 596	9.88 824	11	38	9 22.5
23	9.80 244	15	9.91 430	26	0.08 570	9.88 813	10	37	
24	9.80 259	15	9.91 456	26	0.08 544	9.88 803	10	36	
25	9.80 274	16	9.91 482	25	0.08 518	9.88 793	11	35	16
26	9.80 290	15	9.91 507	26	0.08 493	9.88 782	10	34	
27	9.80 305	15	9.91 533	26	0.08 467	9.88 772	11	33	1 1.6
28	9.80 320	16	9.91 559	26	0.08 441	9.88 761	10	32	2 3.2
29	9.80 336	15	9.91 585	25	0.08 415	9.88 751	10	31	3 4.8
									4 6.4
30	9.80 351	15	9.91 610	26	0.08 390	9.88 741	11	30	5 8.0
31	9.80 366	16	9.91 636	26	0.08 364	9.88 730	10	29	6 9.6
32	9.80 382	15	9.91 662	26	0.08 338	9.88 720	11	28	7 11.2
33	9.80 397	15	9.91 688	25	0.08 312	9.88 709	10	27	8 12.8
34	9.80 412	16	9.91 713	26	0.08 287	9.88 699	11	26	9 14.4
35	9.80 428	15	9.91 739	26	0.08 261	9.88 688	10	25	
36	9.80 443	15	9.91 765	26	0.08 235	9.88 678	10	24	
37	9.80 458	15	9.91 791	25	0.08 209	9.88 668	11	23	
38	9.80 473	16	9.91 816	26	0.08 184	9.88 657	10	22	15
39	9.80 489	15	9.91 842	26	0.08 158	9.88 647	11	21	1 1.5
									2 3.0
40	9.80 504	15	9.91 868	25	0.08 132	9.88 636	10	20	3 4.5
41	9.80 519	15	9.91 893	26	0.08 107	9.88 626	11	19	4 6.0
42	9.80 534	16	9.91 919	26	0.08 081	9.88 615	10	18	5 7.5
43	9.80 550	15	9.91 945	26	0.08 055	9.88 605	11	17	6 9.0
44	9.80 565	15	9.91 971	25	0.08 029	9.88 594	10	16	7 10.5
									8 12.0
45	9.80 580	15	9.91 996	26	0.08 004	9.88 584	11	15	9 13.5
46	9.80 595	15	9.92 022	26	0.07 978	9.88 573	10	14	
47	9.80 610	15	9.92 048	25	0.07 952	9.88 563	11	13	
48	9.80 625	16	9.92 073	26	0.07 927	9.88 552	10	12	
49	9.80 641	15	9.92 099	26	0.07 901	9.88 542	11	11	11 10
50	9.80 656	15	9.92 125	25	0.07 875	9.88 531	10	10	1 1.1 1.0
51	9.80 671	15	9.92 150	26	0.07 850	9.88 521	11	9	2 2.2 2.0
52	9.80 686	15	9.92 176	26	0.07 824	9.88 510	11	8	3 3.3 3.0
53	9.80 701	15	9.92 202	25	0.07 798	9.88 499	10	7	4 4.4 4.0
54	9.80 716	15	9.92 227	26	0.07 773	9.88 489	11	6	5 5.5 5.0
									6 6.6 6.0
55	9.80 731	15	9.92 253	26	0.07 747	9.88 478	10	5	7 7.7 7.0
56	9.80 746	16	9.92 279	25	0.07 721	9.88 468	11	4	8 8.8 8.0
57	9.80 762	15	9.92 304	26	0.07 696	9.88 457	10	3	9 9.9 9.0
58	9.80 777	15	9.92 330	26	0.07 670	9.88 447	11	2	
59	9.80 792	15	9.92 356	25	0.07 644	9.88 436	11	1	
60	9.80 807		9.92 381		0.07 619	9.88 425		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
					40°				
0	9.80 807	15	9.92 381	26	0.07 619	9.88 425	10	60	
1	9.80 822	15	9.92 407	26	0.07 593	9.88 415	11	59	
2	9.80 837	15	9.92 433	25	0.07 567	9.88 404	10	58	
3	9.80 852	15	9.92 458	26	0.07 542	9.88 394	11	57	26
4	9.80 867	15	9.92 484	26	0.07 516	9.88 383	11	56	1 2.6
5	9.80 882	15	9.92 510	25	0.07 490	9.88 372	10	55	2 5.2
6	9.80 897	15	9.92 535	26	0.07 465	9.88 362	11	54	3 7.8
7	9.80 912	15	9.92 561	26	0.07 439	9.88 351	11	53	4 10.4
8	9.80 927	15	9.92 587	25	0.07 413	9.88 340	10	52	5 13.0
9	9.80 942	15	9.92 612	26	0.07 388	9.88 330	11	51	6 15.6
10	9.80 957	15	9.92 638	25	0.07 362	9.88 319	11	50	7 18.2
11	9.80 972	15	9.92 663	26	0.07 337	9.88 308	10	49	8 20.8
12	9.80 987	15	9.92 689	26	0.07 311	9.88 298	11	48	9 23.4
13	9.81 002	15	9.92 715	25	0.07 285	9.88 287	11	47	
14	9.81 017	15	9.92 740	26	0.07 260	9.88 276	10	46	
15	9.81 032	15	9.92 766	26	0.07 234	9.88 266	11	45	25
16	9.81 047	14	9.92 792	25	0.07 208	9.88 255	11	44	1 2.5
17	9.81 061	15	9.92 817	26	0.07 183	9.88 244	10	43	2 5.0
18	9.81 076	15	9.92 843	25	0.07 157	9.88 234	11	42	3 7.5
19	9.81 091	15	9.92 868	26	0.07 132	9.88 223	11	41	4 10.0
20	9.81 106	15	9.92 894	26	0.07 106	9.88 212	11	40	5 12.5
21	9.81 121	15	9.92 920	25	0.07 080	9.88 201	10	39	6 15.0
22	9.81 136	15	9.92 945	26	0.07 055	9.88 191	11	38	7 17.5
23	9.81 151	15	9.92 971	25	0.07 029	9.88 180	11	27	8 20.0
24	9.81 166	14	9.92 996	26	0.07 004	9.88 169	11	36	9 22.5
25	9.81 180	15	9.93 022	26	0.06 978	9.88 158	10	35	
26	9.81 195	15	9.93 048	25	0.06 952	9.88 148	11	34	15
27	9.81 210	15	9.93 073	26	0.06 927	9.88 137	11	33	1 1.5
28	9.81 225	15	9.93 099	25	0.06 901	9.88 126	11	32	2 3.0
29	9.81 240	14	9.93 124	26	0.06 876	9.88 115	10	31	3 4.5
30	9.81 254	15	9.93 150	25	0.06 850	9.88 105	11	30	4 6.0
31	9.81 269	15	9.93 175	26	0.06 825	9.88 094	11	29	5 7.5
32	9.81 284	15	9.93 201	26	0.06 799	9.88 083	11	28	6 9.0
33	9.81 299	15	9.93 227	25	0.06 773	9.88 072	11	27	7 10.5
34	9.81 314	14	9.93 252	26	0.06 748	9.88 061	11	26	8 12.0
35	9.81 328	15	9.93 278	25	0.06 722	9.88 051	10	25	9 13.5
36	9.81 343	15	9.93 303	26	0.06 697	9.88 040	11	24	
37	9.81 358	14	9.93 329	25	0.06 671	9.88 029	11	23	
38	9.81 372	15	9.93 354	26	0.06 646	9.88 018	11	22	14
39	9.81 387	15	9.93 380	26	0.06 620	9.88 007	11	21	1 1.4
40	9.81 402	15	9.93 406	25	0.06 594	9.87 996	11	20	2 2.8
41	9.81 417	14	9.93 431	26	0.06 569	9.87 985	10	19	3 4.2
42	9.81 431	15	9.93 457	25	0.06 543	9.87 975	11	18	4 5.6
43	9.81 446	15	9.93 482	26	0.06 518	9.87 964	11	17	5 7.0
44	9.81 461	14	9.93 508	25	0.06 492	9.87 953	11	16	6 8.4
45	9.81 475	15	9.93 533	26	0.06 467	9.87 942	11	15	7 9.8
46	9.81 490	15	9.93 559	25	0.06 441	9.87 931	11	14	8 11.2
47	9.81 505	14	9.93 584	26	0.06 416	9.87 920	11	13	9 12.6
48	9.81 519	15	9.93 610	26	0.06 390	9.87 909	11	12	
49	9.81 534	15	9.93 636	25	0.06 364	9.87 898	11	11	
50	9.81 549	14	9.93 661	26	0.06 339	9.87 887	10	10	11 10
51	9.81 563	15	9.93 687	25	0.06 313	9.87 877	11	9	1 1.1 1.0
52	9.81 578	14	9.93 712	26	0.06 288	9.87 866	11	8	2 2.2 2.0
53	9.81 592	15	9.93 738	25	0.06 262	9.87 855	11	7	3 3.3 3.0
54	9.81 607	15	9.93 763	26	0.06 237	9.87 844	11	6	4 4.4 4.0
55	9.81 622	14	9.93 789	25	0.06 211	9.87 833	11	5	5 5.5 5.0
56	9.81 636	15	9.93 814	26	0.06 186	9.87 822	11	4	6 6.6 6.0
57	9.81 651	14	9.93 840	25	0.06 160	9.87 811	11	3	7 7.7 7.0
58	9.81 665	15	9.93 865	26	0.06 135	9.87 800	11	2	8 8.8 8.0
59	9.81 680	14	9.93 891	25	0.06 109	9.87 789	11	1	9 9.9 9.0
60	9.81 694		9.93 916		0.06 084	9.87 778		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
					49°				

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TABLE II.—*Common logarithms of circular functions*—Continued

41°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.81 694	15	9.93 916	26	0.06 084	9.87 778	11	60	
1	9.81 709	14	9.93 942	25	0.06 058	9.87 767	11	59	
2	9.81 723	15	9.93 967	26	0.06 033	9.87 756	11	58	
3	9.81 738	14	9.93 993	25	0.06 007	9.87 745	11	57	26
4	9.81 752	15	9.94 018	26	0.05 982	9.87 734	11	56	1 2.6
									2 5.2
5	9.81 767	14	9.94 044	25	0.05 956	9.87 723	11	55	3 7.8
6	9.81 781	15	9.94 069	26	0.05 931	9.87 712	11	54	4 10.4
7	9.81 796	14	9.94 095	25	0.05 905	9.87 701	11	53	5 13.0
8	9.81 810	15	9.94 120	26	0.05 880	9.87 690	11	52	6 15.6
9	9.81 825	14	9.94 146	25	0.05 854	9.87 679	11	51	7 18.2
									8 20.8
10	9.81 839	15	9.94 171	26	0.05 829	9.87 668	11	50	9 23.4
11	9.81 854	14	9.94 197	25	0.05 803	9.87 657	11	49	
12	9.81 868	14	9.94 222	26	0.05 778	9.87 646	11	48	
13	9.81 882	15	9.94 248	25	0.05 752	9.87 635	11	47	25
14	9.81 897	14	9.94 273	26	0.05 727	9.87 624	11	46	1 2.5
15	9.81 911	15	9.94 299	25	0.05 701	9.87 613	12	45	2 5.0
16	9.81 926	14	9.94 324	26	0.05 676	9.87 601	11	44	3 7.5
17	9.81 940	15	9.94 350	25	0.05 650	9.87 590	11	43	4 10.0
18	9.81 955	14	9.94 375	26	0.05 625	9.87 579	11	42	5 12.5
19	9.81 969	14	9.94 401	25	0.05 599	9.87 568	11	41	6 15.0
									7 17.5
20	9.81 983	15	9.94 426	26	0.05 574	9.87 557	11	40	8 20.0
21	9.81 998	14	9.94 452	25	0.05 548	9.87 546	11	39	9 22.5
22	9.82 012	14	9.94 477	26	0.05 523	9.87 535	11	38	
23	9.82 026	15	9.94 503	25	0.05 497	9.87 524	11	37	
24	9.82 041	14	9.94 528	26	0.05 472	9.87 513	12	36	
25	9.82 055	14	9.94 554	25	0.05 446	9.87 501	11	35	15
26	9.82 069	15	9.94 579	25	0.05 421	9.87 490	11	34	
27	9.82 084	14	9.94 604	26	0.05 396	9.87 479	11	33	1 1.5
28	9.82 098	14	9.94 630	25	0.05 370	9.87 468	11	32	2 3.0
29	9.82 112	14	9.94 655	26	0.05 345	9.87 457	11	31	3 4.5
									4 6.0
30	9.82 126	15	9.94 681	25	0.05 319	9.87 446	12	30	5 7.5
31	9.82 141	14	9.94 706	26	0.05 294	9.87 434	11	29	6 9.0
32	9.82 155	14	9.94 732	25	0.05 268	9.87 423	11	28	7 10.5
33	9.82 169	15	9.94 757	26	0.05 243	9.87 412	11	27	8 12.0
34	9.82 184	14	9.94 783	25	0.05 217	9.87 401	11	26	9 13.5
35	9.82 198	14	9.94 808	26	0.05 192	9.87 390	12	25	
36	9.82 212	14	9.94 834	25	0.05 166	9.87 378	11	24	
37	9.82 226	14	9.94 859	25	0.05 141	9.87 367	11	23	14
38	9.82 240	15	9.94 884	26	0.05 116	9.87 356	11	22	
39	9.82 255	14	9.94 910	25	0.05 090	9.87 345	11	21	1 1.4
									2 2.8
40	9.82 269	14	9.94 935	26	0.05 065	9.87 334	12	20	3 4.2
41	9.82 283	14	9.94 961	25	0.05 039	9.87 322	11	19	4 5.6
42	9.82 297	14	9.94 986	26	0.05 014	9.87 311	11	18	5 7.0
43	9.82 311	15	9.95 012	25	0.04 988	9.87 300	12	17	6 8.4
44	9.82 326	14	9.95 037	25	0.04 963	9.87 288	11	16	7 9.8
									8 11.2
45	9.82 340	14	9.95 062	26	0.04 938	9.87 277	11	15	9 12.6
46	9.82 354	14	9.95 088	25	0.04 912	9.87 266	11	14	
47	9.82 368	14	9.95 113	26	0.04 887	9.87 255	12	13	
48	9.82 382	14	9.95 139	25	0.04 861	9.87 243	12	12	
49	9.82 396	14	9.95 164	26	0.04 836	9.87 232	11	11	
									12 11
50	9.82 410	14	9.95 190	25	0.04 810	9.87 221	12	10	1 1.2 1.1
51	9.82 424	15	9.95 215	25	0.04 785	9.87 209	11	9	2 2.4 2.2
52	9.82 439	14	9.95 240	26	0.04 760	9.87 198	11	8	3 3.6 3.3
53	9.82 453	14	9.95 266	25	0.04 734	9.87 187	12	7	4 4.8 4.4
54	9.82 467	14	9.95 291	26	0.04 709	9.87 175	11	6	5 6.0 5.5
									6 7.2 6.6
55	9.82 481	14	9.95 317	25	0.04 683	9.87 164	11	5	7 8.4 7.7
56	9.82 495	14	9.95 342	26	0.04 658	9.87 153	12	4	8 9.6 8.8
57	9.82 509	14	9.95 368	25	0.04 632	9.87 141	11	3	9 10.8 9.9
58	9.82 523	14	9.95 393	25	0.04 607	9.87 130	11	2	
59	9.82 537	14	9.95 418	26	0.04 582	9.87 119	12	1	
60	9.82 551		9.95 444		0.04 556	9.87 107		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

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TABLE II.—*Common logarithms of circular functions*—Continued

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
					42°				
0	9.82 551		9.95 444		0.04 556	9.87 107		60	
1	9.82 565	14	9.95 469	25	0.04 531	9.87 096	11	59	
2	9.82 579	14	9.95 495	26	0.04 505	9.87 085	11	58	
3	9.82 593	14	9.95 520	25	0.04 480	9.87 073	12	57	
4	9.82 607	14	9.95 545	25	0.04 455	9.87 062	11	56	26
		14		26			12		1 2.6
5	9.82 621		9.95 571		0.04 429	9.87 050		55	2 5.2
6	9.82 635	14	9.95 596	25	0.04 404	9.87 039	11	54	3 7.8
7	9.82 649	14	9.95 622	26	0.04 378	9.87 028	11	53	4 10.4
8	9.82 663	14	9.95 647	25	0.04 353	9.87 016	12	52	5 13.0
9	9.82 677	14	9.95 672	25	0.04 328	9.87 005	11	51	6 15.6
		14		26			12		7 18.2
10	9.82 691		9.95 698		0.04 302	9.86 993		50	8 20.8
11	9.82 705	14	9.95 723	25	0.04 277	9.86 982	11	49	9 23.4
12	9.82 719	14	9.95 748	25	0.04 252	9.86 970	12	48	
13	9.82 733	14	9.95 774	26	0.04 226	9.86 959	11	47	
14	9.82 747	14	9.95 799	25	0.04 201	9.86 947	12	46	
		14		26			11		
15	9.82 761		9.95 825		0.04 175	9.86 936		45	25
16	9.82 775	14	9.95 850	25	0.04 150	9.86 924	12	44	1 2.5
17	9.82 788	13	9.95 875	25	0.04 125	9.86 913	11	43	2 5.0
18	9.82 802	14	9.95 901	26	0.04 099	9.86 902	11	42	3 7.5
19	9.82 816	14	9.95 926	25	0.04 074	9.86 890	12	41	4 10.0
		14		26			11		5 12.5
20	9.82 830		9.95 952		0.04 048	9.86 879		40	6 15.0
21	9.82 844	14	9.95 977	25	0.04 023	9.86 867	12	39	7 17.5
22	9.82 858	14	9.96 002	25	0.03 998	9.86 855	12	38	8 20.0
23	9.82 872	14	9.96 028	26	0.03 972	9.86 844	11	37	9 22.5
24	9.82 885	13	9.96 053	25	0.03 947	9.86 832	12	36	
		14		25			11		
25	9.82 899		9.96 078		0.03 922	9.86 821		35	
26	9.82 913	14	9.96 104	26	0.03 896	9.86 809	12	34	
27	9.82 927	14	9.96 129	25	0.03 871	9.86 798	11	33	14
28	9.82 941	14	9.96 155	26	0.03 845	9.86 786	12	32	1 1.4
29	9.82 955	14	9.96 180	25	0.03 820	9.86 775	11	31	2 2.8
		13		25			12		3 4.2
30	9.82 968		9.96 205		0.03 795	9.86 763		30	4 5.6
31	9.82 982	14	9.96 231	26	0.03 769	9.86 752	11	29	5 7.0
32	9.82 996	14	9.96 256	25	0.03 744	9.86 740	12	28	6 8.4
33	9.83 010	14	9.96 281	25	0.03 719	9.86 728	12	27	7 9.8
34	9.83 023	13	9.96 307	26	0.03 693	9.86 717	11	26	8 11.2
		14		25			12		9 12.6
35	9.83 037		9.96 332		0.03 668	9.86 705		25	
36	9.83 051	14	9.96 357	25	0.03 643	9.86 694	11	24	
37	9.83 065	14	9.96 383	26	0.03 617	9.86 682	12	23	
38	9.83 078	13	9.96 408	25	0.03 592	9.86 670	12	22	13
39	9.83 092	14	9.96 433	25	0.03 567	9.86 659	11	21	1 1.3
		14		26			12		
40	9.83 106		9.96 459		0.03 541	9.86 647		20	2 2.6
41	9.83 120	14	9.96 484	25	0.03 516	9.86 635	12	19	3 3.9
42	9.83 133	13	9.96 510	26	0.03 490	9.86 624	11	18	4 5.2
43	9.83 147	14	9.96 535	25	0.03 465	9.86 612	12	17	5 6.5
44	9.83 161	14	9.96 560	25	0.03 440	9.86 600	12	16	6 7.8
		13		26			11		7 9.1
45	9.83 174		9.96 586		0.03 414	9.86 589		15	8 10.4
46	9.83 188	14	9.96 611	25	0.03 389	9.86 577	12	14	9 11.7
47	9.83 202	14	9.96 636	25	0.03 364	9.86 565	12	13	
48	9.83 215	13	9.96 662	26	0.03 338	9.86 554	11	12	
49	9.83 229	14	9.96 687	25	0.03 313	9.86 542	12	11	
		13		25			12		
50	9.83 242		9.96 712		0.03 288	9.86 530		10	12 11
51	9.83 256	14	9.96 738	26	0.03 262	9.86 518	12	9	1 1.2 1.1
52	9.83 270	14	9.96 763	25	0.03 237	9.86 507	11	8	2 2.4 2.2
53	9.83 283	13	9.96 788	25	0.03 212	9.86 495	12	7	3 3.6 3.3
54	9.83 297	14	9.96 814	26	0.03 186	9.86 483	12	6	4 4.8 4.4
		13		25			11		5 6.0 5.5
55	9.83 310		9.96 839		0.03 161	9.86 472		5	6 7.2 6.6
56	9.83 324	14	9.96 864	25	0.03 136	9.86 460	12	4	7 8.4 7.7
57	9.83 338	14	9.96 890	26	0.03 110	9.86 448	12	3	8 9.6 8.8
58	9.83 351	13	9.96 915	25	0.03 085	9.86 436	12	2	9 10.8 9.9
59	9.83 365	14	9.96 940	25	0.03 060	9.86 425	11	1	
		13		26			12		
60	9.83 378		9.96 966		0.03 034	9.86 413		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
					47°				

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TABLE II.—*Common logarithms of circular functions*—Continued

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
					43°				
0	9.83 378	14	9.96 966	25	0.03 034	9.86 413	12	60	
1	9.83 392	13	9.96 991	25	0.03 009	9.86 401	12	59	
2	9.83 405	14	9.97 016	26	0.02 984	9.86 389	12	58	26
3	9.83 419	13	9.97 042	25	0.02 958	9.86 377	11	57	1 2.6
4	9.83 432	14	9.97 067	25	0.02 933	9.86 366	12	56	2 5.2
5	9.83 446	13	9.97 092	26	0.02 908	9.86 354	12	55	3 7.8
6	9.83 459	14	9.97 118	25	0.02 882	9.86 342	12	54	4 10.4
7	9.83 473	13	9.97 143	25	0.02 857	9.86 330	12	53	5 13.0
8	9.83 486	14	9.97 168	25	0.02 832	9.86 318	12	52	6 15.6
9	9.83 500	13	9.97 193	26	0.02 807	9.86 306	11	51	7 18.2
10	9.83 513	14	9.97 219	25	0.02 781	9.86 295	12	50	8 20.8
11	9.83 527	13	9.97 244	25	0.02 756	9.86 283	12	49	9 23.4
12	9.83 540	14	9.97 269	26	0.02 731	9.86 271	12	48	
13	9.83 554	13	9.97 295	25	0.02 705	9.86 259	12	47	
14	9.83 567	14	9.97 320	25	0.02 680	9.86 247	12	46	25
15	9.83 581	13	9.97 345	26	0.02 655	9.86 235	12	45	1 2.5
16	9.83 594	14	9.97 371	25	0.02 629	9.86 223	12	44	2 5.0
17	9.83 608	13	9.97 396	25	0.02 604	9.86 211	11	43	3 7.5
18	9.83 621	13	9.97 421	26	0.02 579	9.86 200	12	42	4 10.0
19	9.83 634	14	9.97 447	25	0.02 553	9.86 188	12	41	5 12.5
20	9.83 648	13	9.97 472	25	0.02 528	9.86 176	12	40	6 15.0
21	9.83 661	13	9.97 497	26	0.02 503	9.86 164	12	39	7 17.5
22	9.83 674	14	9.97 523	25	0.02 477	9.86 152	12	38	8 20.0
23	9.83 688	13	9.97 548	25	0.02 452	9.86 140	12	37	9 22.5
24	9.83 701	14	9.97 573	25	0.02 427	9.86 128	12	36	
25	9.83 715	13	9.97 598	26	0.02 402	9.86 116	12	35	14
26	9.83 728	13	9.97 624	25	0.02 376	9.86 104	12	34	
27	9.83 741	14	9.97 649	25	0.02 351	9.86 092	12	33	1 1.4
28	9.83 755	13	9.97 674	26	0.02 326	9.86 080	12	32	2 2.8
29	9.83 768	13	9.97 700	25	0.02 300	9.86 068	12	31	3 4.2
30	9.83 781	14	9.97 725	25	0.02 275	9.86 056	12	30	4 5.6
31	9.83 795	13	9.97 750	26	0.02 250	9.86 044	12	29	5 7.0
32	9.83 808	13	9.97 776	25	0.02 224	9.86 032	12	28	6 8.4
33	9.83 821	13	9.97 801	25	0.02 199	9.86 020	12	27	7 9.8
34	9.83 834	14	9.97 826	25	0.02 174	9.86 008	12	26	8 11.2
35	9.83 848	13	9.97 851	26	0.02 149	9.85 996	12	25	9 12.6
36	9.83 861	13	9.97 877	25	0.02 123	9.85 984	12	24	
37	9.83 874	13	9.97 902	25	0.02 098	9.85 972	12	23	
38	9.83 887	14	9.97 927	26	0.02 073	9.85 960	12	22	13
39	9.83 901	13	9.97 953	25	0.02 047	9.85 948	12	21	1 1.3
40	9.83 914	13	9.97 978	25	0.02 022	9.85 936	12	20	2 2.6
41	9.83 927	13	9.98 003	26	0.01 997	9.85 924	12	19	3 3.9
42	9.83 940	14	9.98 029	25	0.01 971	9.85 912	12	18	4 5.2
43	9.83 954	13	9.98 054	25	0.01 946	9.85 900	12	17	5 6.5
44	9.83 967	13	9.98 079	25	0.01 921	9.85 888	12	16	6 7.8
45	9.83 980	13	9.98 104	26	0.01 896	9.85 876	12	15	7 9.1
46	9.83 993	13	9.98 130	25	0.01 870	9.85 864	13	14	8 10.4
47	9.84 006	14	9.98 155	25	0.01 845	9.85 851	12	13	9 11.7
48	9.84 020	13	9.98 180	26	0.01 820	9.85 839	12	12	
49	9.84 033	13	9.98 206	25	0.01 794	9.85 827	12	11	
50	9.84 046	13	9.98 231	25	0.01 769	9.85 815	12	10	12 11
51	9.84 059	13	9.98 256	25	0.01 744	9.85 803	12	9	1 1.2 1.1
52	9.84 072	13	9.98 281	26	0.01 719	9.85 791	12	8	2 2.4 2.2
53	9.84 085	13	9.98 307	25	0.01 693	9.85 779	13	7	3 3.6 3.3
54	9.84 098	14	9.98 332	25	0.01 668	9.85 766	12	6	4 4.8 4.4
55	9.84 112	13	9.98 357	26	0.01 643	9.85 754	12	5	5 6.0 5.5
56	9.84 125	13	9.98 383	25	0.01 617	9.85 742	12	4	6 7.2 6.6
57	9.84 138	13	9.98 408	25	0.01 592	9.85 730	12	3	7 8.4 7.7
58	9.84 151	13	9.98 433	25	0.01 567	9.85 718	12	2	8 9.6 8.8
59	9.84 164	13	9.98 458	26	0.01 542	9.85 706	13	1	9 10.8 9.9
60	9.84 177		9.98 484		0.01 516	9.85 693		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.
					46°				

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TABLE II.—*Common logarithms of circular functions*—Continued

44°

′	L. Sin.	d.	L. Tan.	c. d.	L. Cot.	L. Cos.	d.		Prop. Pts.
0	9.84 177	13	9.98 484	25	0.01 516	9.85 693	12	60	
1	9.84 190	13	9.98 509	25	0.01 491	9.85 681	12	59	
2	9.84 203	13	9.98 534	26	0.01 466	9.85 669	12	58	
3	9.84 216	13	9.98 560	25	0.01 440	9.85 657	12	57	26
4	9.84 229	13	9.98 585	25	0.01 415	9.85 645	13	56	1 2.6
5	9.84 242	13	9.98.610	25	0.01 390	9.85 632	12	55	2 5.2
6	9.84 255	14	9.98.635	26	0.01 365	9.85 620	12	54	3 7.8
7	9.84 269	13	9.98 661	25	0.01 339	9.85 608	12	53	4 10.4
8	9.84 282	13	9.98 686	25	0.01 314	9.85 596	13	52	5 13.0
9	9.84 295	13	9.98 711	26	0.01 289	9.85 583	12	51	6 15.6
10	9.84 308	13	9.98 737	25	0.01 263	9.85 571	12	50	7 18.2
11	9.84 321	13	9.98 762	25	0.01 238	9.85 559	12	49	8 20.8
12	9.84 334	13	9.98 787	25	0.01 213	9.85 547	13	48	9 23.4
13	9.84 347	13	9.98.812	26	0.01 188	9.85 534	12	47	
14	9.84 360	13	9.98 838	25	0.01 162	9.85 522	12	46	
15	9.84 373	12	9.98 863	25	0.01 137	9.85 510	13	45	25
16	9.84 385	13	9.98 888	25	0.01 112	9.85 497	12	44	1 2.5
17	9.84 398	13	9.98 913	26	0.01 087	9.85 485	12	43	2 5.0
18	9.84 411	13	9.98 939	25	0.01 061	9.85 473	13	42	3 7.5
19	9.84 424	13	9.98 964	25	0.01 036	9.85 460	12	41	4 10.0
20	9.84 437	13	9.98 989	26	0.01 011	9.85 448	12	40	5 12.5
21	9.84 450	13	9 99 015	25	0.00 985	9.85 436	13	39	6 15.0
22	9.84 463	13	9.99 040	25	0.00 960	9.85 423	12	38	7 17.5
23	9.84 476	13	9.99 065	25	0.00 935	9.85 411	12	37	8 20.0
24	9.84 489	13	9.99 090	26	0.00 910	9.85 399	13	36	9 22.5
25	9.84 502	13	9.99 116	25	0.00 884	9.85 386	12	35	
26	9.84 515	13	9.99 141	25	0.00 859	8.85 374	13	34	14
27	9.84 528	12	9.99 166	25	0.00 834	9.85 361	12	33	1 1.4
28	9.84 540	13	9.99 191	26	0.00 809	9.85 349	12	32	2 2.8
29	9.84 553	13	9.99 217	25	0.00 783	9.85 337	13	31	3 4.2
30	9.84 566	13	9.99 242	25	0.00 758	9.85 324	12	30	4 5.6
31	9.84 579	13	9.99 267	26	0.00 733	9.85 312	13	29	5 7.0
32	9.84 592	13	9.99 293	25	0.00 707	9.85 299	12	28	6 8.4
33	9.84 605	13	9.99 318	25	0.00 682	9.85 287	13	27	7 9.8
34	9.84 618	12	9.99 343	25	0.00 657	9.85 274	12	26	8 11.2
35	9 84 630	13	9.99 368	26	0.00 632	9.85 262	12	25	9 12.6
36	9.84 643	13	9.99 394	25	0.00 606	9.85 250	13	24	
37	9.84 656	13	9.99 419	25	0.00 581	9.85 237	12	23	
38	9.84 669	13	9.99 444	25	0.00 556	9.85 225	13	22	13
39	9.84 682	12	9.99 469	26	0.00 531	9.85 212	12	21	1 1.3
40	9.84 694	13	9.99 495	25	0.00 505	9.85 200	13	20	2 2.6
41	9.84 707	13	9.99 520	25	0.00 480	9.85 187	12	19	3 3.9
42	9.84 720	13	9.99 545	25	0.00 455	9.85 175	13	18	4 5.2
43	9.84 733	12	9.99 570	26	0.00 430	9.85 162	12	17	5 6.5
44	9.84 745	13	9.99 596	25	0.00 404	9.85 150	13	16	6 7.8
45	9.84 758	13	9.99 621	25	0.00 379	9.85 137	12	15	7 9.1
46	9.84 771	13	9.99 646	26	0.00 354	9.85 125	13	14	8 10.4
47	9.84 784	12	9.99 672	25	0.00 328	9.85 112	12	13	9 11.7
48	9.84 796	13	9.99 697	25	0.00 303	9.85 100	13	12	
49	9.84 809	13	9.99 722	25	0.00 278	9.85 087	13	11	
50	9.84 822	13	9.99 747	26	0.00 253	9.85 074	12	10	12
51	9.84 835	12	9.99 773	25	0.00 227	9.85 062	13	9	1 1.2
52	9.84 847	13	9.99 798	25	0.00 202	9.85 049	12	8	2 2.4
53	9.84 860	13	9.99 823	25	0.00 177	9.85 037	13	7	3 3.6
54	9.84 873	12	9.99 848	26	0.00 152	9.85 024	12	6	4 4.8
55	9.84 885	13	9.99 874	25	0.00 126	9.85 012	13	5	5 6.0
56	9.84 898	13	9.99 899	25	0.00 101	9.84 999	13	4	6 7.2
57	9.84 911	12	9.99 924	25	0.00 076	9.84 986	12	3	7 8.4
58	9.84 923	13	9.99 949	26	0.00 051	9.84 974	13	2	8 9.6
59	9.84 936	13	9.99 975	25	0.00 025	9.84 961	12	1	9 10.8
60	9.84 949		0.00 000		0.00 000	9.84 949		0	
	L. Cos.	d.	L. Cot.	c. d.	L. Tan.	L. Sin.	d.	′	Prop. Pts.

45°

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TABLE III
NATURAL SINES AND COSINES
(For every minute of the quadrant)

M.	0°		1°		2°		3°		4°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0.00000	1.0000	0.01745	0.99985	0.03490	0.99939	0.05234	0.99863	0.06976	0.99756	60
1	029	000	774	984	519	938	263	861	.07005	754	59
2	058	000	803	984	548	937	292	860	034	752	58
3	087	000	832	983	577	936	321	858	063	750	57
4	116	000	862	983	606	935	350	857	092	748	56
5	.00145	1.0000	.01891	.99982	.03635	.099934	.05379	.99855	.07121	.99746	55
6	175	000	920	982	664	933	408	854	150	744	54
7	204	000	949	981	693	932	437	852	179	742	53
8	233	000	978	980	723	931	466	851	208	740	52
9	262	000	.02007	980	752	930	495	849	237	738	51
10	.00291	1.0000	.02036	.99979	.03781	.99929	.05524	.99847	.07266	.99736	50
11	320	.99999	065	979	810	927	553	846	295	734	49
12	349	999	094	978	839	926	582	844	324	731	48
13	378	999	123	977	868	925	611	842	353	729	47
14	407	999	152	977	897	924	640	841	382	727	46
15	.00436	.99999	.02181	.99976	.03926	.99923	.05669	.99839	.07411	.99725	45
16	465	999	211	976	955	922	698	838	440	723	44
17	495	999	240	975	984	921	727	836	469	721	43
18	524	999	269	974	.04013	919	756	834	498	719	42
19	553	998	298	974	042	918	785	833	527	716	41
20	.00582	.99998	.02327	.99973	.04071	.99917	.05814	.99831	.07556	.99714	40
21	611	998	356	972	100	916	844	829	585	712	39
22	640	998	385	972	129	915	873	827	614	710	38
23	669	998	414	971	159	913	902	826	643	708	37
24	698	998	443	970	188	912	931	824	672	705	36
25	.00727	.99997	.02472	.99969	.04217	.99911	.05960	.99822	.07701	.99703	35
26	756	997	501	969	246	910	989	821	730	701	34
27	785	997	530	968	275	909	.06018	819	759	699	33
28	814	997	560	967	304	907	047	817	788	696	32
29	844	996	589	966	333	906	076	815	817	694	31
30	.00873	.99996	.02618	.99966	.04362	.99905	.06105	.99813	.07846	.99692	30
31	902	996	647	965	391	904	134	812	875	689	29
32	931	996	676	964	420	902	163	810	904	687	28
33	960	995	705	963	449	901	192	808	933	685	27
34	989	995	734	963	478	900	221	806	962	683	26
35	.01018	.99995	.02763	.99962	.04507	.99898	.06250	.99804	.07991	.99680	25
36	047	995	792	961	536	897	279	803	.08020	678	24
37	076	994	821	960	565	896	308	801	049	676	23
38	105	994	850	959	594	894	337	799	078	673	22
39	134	994	879	959	623	893	366	797	107	671	21
40	.01164	.99993	.02908	.99958	.04653	.99892	.06395	.99795	.08136	.99668	20
41	193	993	938	957	682	890	424	793	165	666	19
42	222	993	967	956	711	889	453	792	194	664	18
43	251	992	996	955	740	888	482	790	223	661	17
44	280	992	.03025	954	769	886	511	788	252	659	16
45	.01309	.99991	.03054	.99953	.04798	.99885	.06540	.99786	.08281	.99657	15
46	338	991	083	952	827	883	569	784	310	654	14
47	367	991	112	952	856	882	598	782	339	652	13
48	396	990	141	951	885	881	627	780	368	649	12
49	425	990	170	950	914	879	656	778	397	647	11
50	.01454	.99989	.03199	.99949	.04943	.99878	.06685	.99776	.08426	.99644	10
51	483	989	228	948	972	876	714	774	455	642	9
52	513	989	257	947	.05001	875	743	772	484	639	8
53	542	988	286	946	030	873	773	770	513	637	7
54	571	988	316	945	059	872	802	768	542	635	6
55	.01600	.99987	.03345	.99944	.05088	.99870	.06831	.99766	.08571	.99632	5
56	629	987	374	943	117	869	860	764	600	630	4
57	658	986	403	942	146	867	889	762	629	627	3
58	687	986	432	941	175	866	918	760	658	625	2
59	716	985	461	940	205	864	947	758	687	622	1
60	.01745	.99985	.03490	.99939	.05234	.99863	.06976	.99756	.08716	.99619	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	89°		88°		87°		86°		85°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	5°		6°		7°		8°		9°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0.08716	0.99619	0.10453	0.99452	0.12187	0.99255	0.13917	0.99027	0.15643	0.98769	60
1	745	617	482	449	216	251	946	023	672	764	59
2	774	614	511	446	245	248	975	019	701	760	58
3	803	612	540	443	274	244	.14004	015	730	755	57
4	831	609	569	440	302	240	033	011	758	751	56
5	.08860	.99607	.10597	.99437	.12331	.99237	.14061	.99006	.15787	.98746	55
6	889	604	626	434	360	233	090	002	816	741	54
7	918	602	655	431	389	230	119	.98998	845	737	53
8	947	599	684	428	418	226	148	994	873	732	52
9	976	596	713	424	447	222	177	990	902	728	51
10	.09005	.99594	.10742	.99421	.12476	.99219	.14205	.98986	.15931	.98723	50
11	034	591	771	418	504	215	234	982	959	718	49
12	063	588	800	415	533	211	263	978	988	714	48
13	092	586	829	412	562	208	292	973	.16017	709	47
14	121	583	858	409	591	204	320	969	046	704	46
15	.09150	.99580	.10887	.99406	.12620	.99200	.14349	.98965	.16074	.98700	45
16	179	578	916	402	649	197	378	961	103	695	44
17	208	575	945	399	678	193	407	957	132	690	43
18	237	572	973	396	706	189	436	953	160	686	42
19	266	570	.11002	393	735	186	464	948	189	681	41
20	.09295	.99567	.11031	.99390	.12764	.99182	.14493	.98944	.16218	98676	40
21	324	564	060	386	793	178	522	940	246	671	39
22	353	562	089	383	822	175	551	936	275	667	38
23	382	559	118	380	851	171	580	931	304	662	37
24	411	556	147	377	880	167	608	927	333	657	36
25	.09440	.99553	.11176	.99374	.12908	.99163	.14637	.98923	.16361	.98652	35
26	469	551	205	370	937	160	666	919	390	648	34
27	498	548	234	367	966	156	695	914	419	643	33
28	527	545	263	364	995	152	723	910	447	638	32
29	556	542	291	360	.13024	148	752	906	476	633	31
30	.09585	.99540	.11320	.99357	.13053	.99144	.14781	.98902	.16505	.98629	30
31	614	537	349	354	081	141	810	897	533	624	29
32	642	534	378	351	110	137	838	893	562	619	28
33	671	531	407	347	139	133	867	889	591	614	27
34	700	528	436	344	168	129	896	884	620	609	26
35	.09729	.99526	.11465	.99341	.13197	.99125	.14925	.98880	.16648	.98604	25
36	758	523	494	337	226	122	954	876	677	600	24
37	787	520	523	334	254	118	982	871	706	595	23
38	816	517	552	331	283	114	.15011	867	734	590	22
39	845	514	580	327	312	110	040	863	763	585	21
40	.09874	.99511	.11609	.99324	.13341	.99106	.15069	.98858	.16792	.98580	20
41	903	508	638	320	370	102	097	854	820	575	19
42	932	506	667	317	399	098	126	849	849	570	18
43	961	503	696	314	427	094	155	845	878	565	17
44	990	500	725	310	456	091	184	841	906	561	16
45	.10019	.99497	.11754	.99307	.13485	.99087	.15212	.98836	.16935	.98556	15
46	048	494	783	303	514	083	241	832	964	551	14
47	077	491	812	300	543	079	270	827	992	546	13
48	106	488	840	297	572	075	299	823	.17021	541	12
49	135	485	869	293	600	071	327	818	050	536	11
50	.10164	.99482	.11898	.99290	.13629	.99067	.15356	.98814	.17078	.98531	10
51	192	479	927	286	658	063	385	809	107	526	9
52	221	476	956	283	687	059	414	805	136	521	8
53	250	473	985	279	716	055	442	800	164	516	7
54	279	470	.12014	276	744	051	471	796	193	511	6
55	.10308	.99467	.12043	.99272	.13773	.99047	.15500	.98791	.17222	.98506	5
56	337	464	071	269	802	043	529	787	250	501	4
57	366	461	100	265	831	039	557	782	279	496	3
58	395	458	129	262	860	035	586	778	308	491	2
59	424	455	158	258	889	031	615	773	336	486	1
60	.10453	.99452	.12187	.99255	.13917	.99027	.15643	.98769	.17365	.98481	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	84°		83°		82°		81°		80°		

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TABLE III.—*Natural sines and cosines*—Continued

M	10°		11°		12°		13°		14°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0. 17365	0. 98481	0. 19081	0. 98163	0. 20791	0. 97815	0. 22495	0. 97437	0. 24192	0. 97030	60
1	393	476	109	157	820	809	523	430	220	023	59
2	422	471	138	152	848	803	552	424	249	015	58
3	451	466	167	146	877	797	580	417	277	008	57
4	479	461	195	140	905	791	608	411	305	001	56
5	.17508	.98455	.19224	.98135	.20933	.97784	.22637	.97404	.24333	.96994	55
6	537	450	252	129	962	778	665	398	362	987	54
7	565	445	281	124	990	772	693	391	390	980	53
8	594	440	309	118	.21019	766	722	384	418	973	52
9	623	435	338	112	047	760	750	378	446	966	51
10	.17651	.98430	.19366	.98107	.21076	.97754	.22778	.97371	.24474	.96959	50
11	680	425	395	101	104	748	807	365	503	952	49
12	708	420	423	096	132	742	835	358	531	945	48
13	737	414	452	090	161	735	863	351	559	937	47
14	766	409	481	084	189	729	892	345	587	930	46
15	.17794	.98404	.19509	.98079	.21218	.97723	.22920	.97338	.24615	.96923	45
16	823	399	538	073	246	717	948	331	644	916	44
17	852	394	566	067	275	711	977	325	672	909	43
18	880	389	595	061	303	705	.23005	318	700	902	42
19	909	383	623	056	331	698	033	311	728	894	41
20	.17937	.98378	.19652	.98050	.21360	.97692	.23062	.97304	.24756	.96887	40
21	966	373	680	044	388	686	090	298	784	880	39
22	995	368	709	039	417	680	118	291	813	873	38
23	.18023	362	737	033	445	673	146	284	841	866	37
24	052	357	766	027	474	667	175	278	869	858	36
25	.18081	.98352	.19794	.98021	.21502	.97661	.23203	.97271	.24897	.96851	35
26	109	347	823	016	530	655	231	264	925	844	34
27	138	341	851	010	559	648	260	257	954	837	33
28	166	336	880	004	587	642	288	251	982	829	32
29	195	331	908	.97998	616	636	316	244	.25010	822	31
30	.18224	.98325	.19937	.97992	.21644	.97630	.23345	.97237	.25038	.96815	30
31	252	320	965	987	672	623	373	230	066	807	29
32	281	315	994	981	701	617	401	223	094	800	28
33	309	310	.20022	975	729	611	429	217	122	793	27
34	338	304	051	969	758	604	458	210	151	786	26
35	.18367	.98299	.20079	.97963	.21786	.97598	.23486	.97203	.25179	.96778	25
36	395	294	108	958	814	592	514	196	207	771	24
37	424	288	136	952	843	585	542	189	235	764	23
38	452	283	165	946	871	579	571	182	263	756	22
39	481	277	193	940	899	573	599	176	291	749	21
40	.18509	.98272	.20222	.97934	.21928	.97566	.23627	.97169	.25320	.96742	20
41	538	267	250	928	956	560	656	162	348	734	19
42	567	261	279	922	985	553	684	155	376	727	18
43	595	256	307	916	.22013	547	712	148	404	719	17
44	624	250	336	910	041	541	740	141	432	712	16
45	.18652	.98245	.20364	.97905	.22070	.97534	.23769	.97134	.25460	.96705	15
46	681	240	393	899	098	528	797	127	488	697	14
47	710	234	421	893	126	521	825	120	516	690	13
48	738	229	450	887	155	515	853	113	545	682	12
49	767	223	478	881	183	508	882	106	573	675	11
50	.18795	.98218	.20507	.97875	.22212	.97502	.23910	.97100	.25601	.96667	10
51	824	212	535	869	240	496	938	093	629	660	9
52	852	207	563	863	268	489	966	086	657	653	8
53	881	201	592	857	297	483	995	079	685	645	7
54	910	196	620	851	325	476	.24023	072	713	638	6
55	.18938	.98190	.20649	.97845	.22353	.97470	.24051	.97065	.25741	.96630	5
56	967	185	677	839	382	463	079	058	769	623	4
57	995	179	706	833	410	457	108	051	798	615	3
58	.19024	174	734	827	438	450	136	044	826	608	2
59	052	168	763	821	467	444	164	037	854	600	1
60	.19081	.98163	.20791	.97815	.22495	.97437	.24192	.97030	.25882	.96593	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	79°		78°		77°		76°		75°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	15°		16°		17°		18°		19°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0. 25882	0. 96593	0. 27564	0. 96126	0. 29237	0. 95630	0. 30902	0. 95106	0. 32557	0. 94552	60
1	910	585	592	118	265	622	929	097	584	542	59
2	938	578	620	110	293	613	957	088	612	533	58
3	966	570	648	102	321	605	985	079	639	523	57
4	994	562	676	094	348	596	.31012	070	667	514	56
5	.26022	.96555	.27704	.96086	.29376	.95588	.31040	.95061	.32694	.94504	55
6	050	547	731	078	404	579	086	052	722	495	54
7	079	540	759	070	432	571	095	043	749	485	53
8	107	532	787	062	460	562	123	033	777	476	52
9	135	524	815	054	487	554	151	024	804	466	51
10	.26163	.96517	.27843	.96046	.29515	.95545	.31178	.95015	.32832	.94457	50
11	191	509	871	037	543	536	206	006	859	447	49
12	219	502	899	029	571	528	233	.94997	887	438	48
13	247	494	927	021	599	519	261	988	914	428	47
14	275	486	955	013	626	511	289	979	942	418	46
15	.26309	.96479	.27983	.96005	.29654	.95502	.31316	.94970	.32969	.94409	45
16	331	471	.28011	.95997	682	493	344	961	997	399	44
17	359	463	039	989	710	485	372	952	.33024	390	43
18	387	456	067	981	737	476	399	943	051	380	42
19	415	448	095	972	765	467	427	933	079	370	41
20	.26443	.96440	.28123	.95964	.29793	.95459	.31454	.94924	.33106	.94361	40
21	471	433	150	956	821	450	482	915	134	351	39
22	500	425	178	948	849	441	510	906	161	342	38
23	528	417	206	940	876	433	537	807	189	332	37
24	556	410	234	931	904	424	565	888	216	322	36
25	.26584	.96402	.28262	.95923	.29932	.95415	.31593	.94878	.33244	.94313	35
26	612	394	290	915	960	407	620	869	271	303	34
27	640	386	318	907	987	398	648	860	298	293	33
28	668	379	346	898	.30015	389	675	851	326	284	32
29	696	371	374	890	043	380	703	842	353	274	31
30	.26724	.96363	.28402	.95882	.30071	.95372	.31730	.94832	.33381	.94264	30
31	752	355	429	874	098	363	758	823	408	254	29
32	780	347	457	865	126	354	786	814	436	245	28
33	808	340	485	857	154	345	813	805	463	235	27
34	836	332	513	849	182	337	841	795	490	225	26
35	.26864	.96324	.28541	.95841	.30209	.95328	.31868	.94786	.33518	.94215	25
36	892	316	569	832	237	319	896	777	545	206	24
37	920	308	597	824	265	310	923	768	573	196	23
38	948	301	625	816	292	301	951	758	600	186	22
39	976	293	652	807	320	293	979	749	627	176	21
40	.27004	.96285	.28680	.95799	.30348	.95284	.32006	.94740	.33655	.94167	20
41	032	277	708	791	376	275	034	730	682	157	19
42	060	269	736	782	403	266	061	721	710	147	18
43	088	261	764	774	431	257	089	712	737	137	17
44	116	253	792	766	459	248	116	702	764	127	16
45	.27144	.96246	.28820	.95757	.30486	.95240	.32144	.94693	.33792	.94118	15
46	172	238	847	749	514	231	171	684	819	108	14
47	200	230	875	740	542	222	199	674	846	098	13
48	228	222	903	732	570	213	227	665	874	088	12
49	256	214	931	724	597	204	254	656	901	078	11
50	.27284	.96206	.28959	.95715	.30625	.95195	.32282	.94646	.33929	.94068	10
51	312	198	987	707	653	186	309	637	956	058	9
52	340	190	.29015	698	680	177	337	627	983	049	8
53	368	182	042	690	708	168	364	618	.34011	039	7
54	396	174	070	681	736	159	392	609	038	029	6
55	.27424	.96166	.29098	.95673	.30763	.95150	.32419	.94599	.34065	.94019	5
56	452	158	126	664	791	142	447	590	093	009	4
57	480	150	154	656	819	133	474	580	120	.93999	3
58	508	142	182	647	846	124	502	571	147	989	2
59	536	134	209	639	874	115	529	561	175	979	1
60	.27564	.96126	.29237	.95630	.30902	.95106	.32557	.94552	.34202	.93969	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	74°		73°		72°		71°		70°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	20°		21°		22°		23°		24°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0.34202	0.93969	0.35837	0.93358	0.37461	0.92718	0.39073	0.92050	0.40674	0.91355	60
1	229	959	864	348	488	707	100	039	700	343	59
2	257	949	891	337	515	697	127	028	727	331	58
3	284	939	918	327	542	686	153	016	753	319	57
4	311	929	945	316	569	675	180	005	780	307	56
5	.34339	.93919	.35973	.93306	.37595	.92664	.39207	.91994	.40806	.91295	55
6	366	909	.36000	295	622	653	234	982	833	283	54
7	393	899	027	285	649	642	260	971	860	272	53
8	421	889	054	274	676	631	287	959	886	260	52
9	448	879	081	264	703	620	314	948	913	248	51
10	.34475	.93869	.36108	.93253	.37730	.92609	.39341	.91936	.40939	.91236	50
11	503	859	135	243	757	598	367	925	966	224	49
12	530	849	162	232	784	587	394	914	992	212	48
13	557	839	190	222	811	576	421	902	.41019	200	47
14	584	829	217	211	838	565	448	891	045	188	46
15	.34612	.93819	.36244	.93201	.37865	.92554	.39474	.91879	.41072	.91176	45
16	639	809	271	190	892	543	501	868	098	164	44
17	666	799	298	180	919	532	528	856	125	152	43
18	694	789	325	169	946	521	555	845	151	140	42
19	721	779	352	159	973	510	581	833	178	128	41
20	.34748	.93769	.36379	.93148	.37999	.92499	.39608	.91822	.41204	.91116	40
21	775	759	406	137	.38026	488	635	810	231	104	39
22	803	748	434	127	053	477	661	799	257	092	38
23	830	738	461	116	080	466	688	787	284	080	37
24	857	728	488	106	107	455	715	775	310	068	36
25	.34884	.93718	.36515	.93095	.38134	.92444	.39741	.91764	.41337	.91056	35
26	912	708	542	084	161	432	768	752	363	044	34
27	939	698	569	074	188	421	795	741	390	032	33
28	966	688	596	063	215	410	822	729	416	020	32
29	993	677	623	052	241	399	848	718	443	008	31
30	.35021	.93667	.36650	.93042	.38268	.92388	.39875	.91706	.41469	.90996	30
31	048	657	677	031	295	377	902	694	496	984	29
32	075	647	704	020	322	366	928	683	522	972	28
33	102	637	731	010	349	355	955	671	549	960	27
34	130	626	758	.92999	376	343	982	660	575	948	26
35	.35157	.93616	.36785	.92988	.38403	.92332	.40008	.91648	.41602	.90936	25
36	184	606	812	978	430	321	035	636	628	924	24
37	211	596	839	967	456	310	062	625	655	911	23
38	239	585	867	956	483	299	088	613	681	899	22
39	266	575	894	945	510	287	115	601	707	887	21
40	.35293	.93565	.36921	.92935	.38537	.92276	.40141	.91590	.41734	.90875	20
41	320	555	948	924	564	265	168	578	760	863	19
42	347	544	975	913	591	254	195	566	787	851	18
43	375	534	.37002	902	617	243	221	555	813	839	17
44	402	524	029	892	644	231	248	543	840	826	16
45	.35429	.93514	.37056	.92881	.38671	.92220	.40275	.91531	.41866	.90814	15
46	456	503	083	870	698	209	301	519	892	802	14
47	484	493	110	859	725	198	328	508	919	790	13
48	511	483	137	849	752	186	355	496	945	778	12
49	538	472	164	838	778	175	381	484	972	766	11
50	.35565	.93462	.37191	.92827	.38805	.92164	.40408	.91472	.41998	.90753	10
51	592	452	218	816	832	152	434	461	.42024	741	9
52	619	441	245	805	859	141	461	449	051	729	8
53	647	431	272	794	886	130	488	437	077	717	7
54	674	420	299	784	912	119	514	425	104	704	6
55	.35701	.93410	.37326	.92773	.38939	.92107	.40541	.91414	.42130	.90692	5
56	728	400	353	762	966	096	567	402	156	680	4
57	755	389	380	751	993	085	594	390	183	668	3
58	782	379	407	740	.39020	073	621	378	209	655	2
59	810	368	434	729	046	062	647	366	235	643	1
60	.35837	.93358	.37461	.92718	.39073	.92050	.40674	.91355	.42262	.90631	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	69°		68°		67°		66°		65°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	25°		26°		27°		28°		29°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0.42262	0.90631	0.43837	0.89879	0.45399	0.89101	0.46947	0.88295	0.48481	0.87462	60
1	288	618	863	867	425	087	973	281	506	448	59
2	315	606	889	854	451	074	999	267	532	434	58
3	341	594	916	841	477	061	.47024	254	557	420	57
4	367	582	942	828	503	048	050	240	583	406	56
5	.42394	.90569	.43968	.89816	.45529	.89035	.47076	.88226	.48608	.87391	55
6	420	557	994	803	554	021	101	213	634	377	54
7	446	545	.44020	790	580	008	127	199	659	363	53
8	473	532	046	777	606	.88995	153	185	684	349	52
9	499	520	072	764	632	981	178	172	710	335	51
10	.42525	.90507	.44098	.89752	.45658	.88968	.47204	.88158	.48735	.87321	50
11	552	495	124	739	684	955	229	144	761	306	49
12	578	483	151	726	710	942	255	130	786	292	48
13	604	470	177	713	736	928	281	117	811	278	47
14	631	458	203	700	762	915	306	103	837	264	46
15	.42657	.90446	.44229	.89687	.45787	.88902	.47332	.88089	.48862	.87250	45
16	683	433	255	674	813	888	358	075	888	235	44
17	709	421	281	662	839	875	383	062	913	221	43
18	736	408	307	649	865	862	409	048	938	207	42
19	762	396	333	636	891	848	434	034	964	193	41
20	.42788	.90383	.44359	.89623	.45917	.88835	.47460	.88020	.48989	.87178	40
21	815	371	385	610	942	822	486	006	.49014	164	39
22	841	358	411	597	968	808	511	.87993	040	150	38
23	867	346	437	584	994	795	537	979	065	136	37
24	894	334	464	571	.46020	782	562	905	090	121	36
25	.42920	.90321	.44490	.89558	.46046	.88768	.47588	.87951	.49116	.87107	35
26	946	309	516	545	072	755	614	937	141	093	34
27	972	296	542	532	097	741	639	923	166	079	33
28	999	284	568	519	123	728	665	909	192	064	32
29	.43025	271	594	506	149	715	690	896	217	050	31
30	.43051	.90259	.44620	.89493	.46175	.88701	.47716	.87882	.49242	.87036	30
31	077	246	646	480	201	688	741	868	268	021	29
32	104	233	672	467	226	674	767	854	293	007	28
33	130	221	698	454	252	661	793	840	318	.86993	27
34	156	208	724	441	278	647	818	826	344	978	26
35	.43182	.90196	.44750	.89428	.46304	.88634	.47844	.87812	.49369	.86964	25
36	209	183	776	415	330	620	869	798	394	949	24
37	235	171	802	402	355	607	895	784	419	935	23
38	261	158	828	389	381	593	920	770	445	921	22
39	287	146	854	376	407	580	946	756	470	906	21
40	.43313	.90133	.44880	.89363	.46433	.88566	.47971	.87743	.49495	.86892	20
41	340	120	906	350	458	553	997	729	521	878	19
42	366	108	932	337	484	539	.48022	715	546	863	18
43	392	095	958	324	510	526	048	701	571	849	17
44	418	082	984	311	536	512	073	687	596	834	16
45	.43445	.90070	.45010	.89298	.46561	.88499	.48099	.87673	.49622	.86820	15
46	471	057	036	285	587	485	124	659	647	805	14
47	497	045	062	272	613	472	150	645	672	791	13
48	523	032	088	259	639	458	175	631	697	777	12
49	549	019	114	245	664	445	201	617	723	762	11
50	.43575	.90007	.45140	.89232	.46690	.88431	.48226	.87603	.49748	.86748	10
51	602	.89994	166	219	716	417	252	589	773	733	9
52	628	981	192	206	742	404	277	575	798	719	8
53	654	968	218	193	767	390	303	561	824	704	7
54	680	956	243	180	793	377	328	546	849	690	6
55	.43706	.89943	.45269	.89167	.46819	.88363	.48354	.87532	.49874	.86675	5
56	733	930	295	153	844	349	379	518	899	661	4
57	759	918	321	140	870	336	405	504	924	646	3
58	785	905	347	127	896	322	430	490	950	632	2
59	811	892	373	114	921	308	456	476	975	617	1
60	.43837	.89879	.45399	.89101	.46947	.88295	.48481	.87462	.50000	.86603	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	64°		63°		62°		61°		60°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	30°		31°		32°		33°		34°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0. 50000	0. 86603	0. 51504	0. 85717	0. 52992	0. 84805	0. 54404	0. 83867	0. 55919	0. 82904	60
1	025	588	529	702	. 53017	789	488	851	943	887	59
2	050	573	554	687	041	774	513	835	968	871	58
3	076	559	579	672	066	759	537	819	992	855	57
4	101	544	604	657	091	743	561	804	. 56016	839	56
5	. 50126	. 86530	. 51628	. 85642	. 53115	. 84728	. 54586	. 83788	. 56040	. 82822	55
6	151	515	653	627	140	712	610	772	064	806	54
7	176	501	678	612	164	697	635	756	088	790	53
8	201	486	703	597	189	681	659	740	112	773	52
9	227	471	728	582	214	666	683	724	136	757	51
10	. 50252	. 86457	. 51753	. 85567	. 53238	. 84650	. 54708	. 83708	. 56160	. 82741	50
11	277	442	778	551	263	635	732	692	184	724	49
12	302	427	803	536	288	619	756	676	208	708	48
13	327	413	828	521	312	604	781	660	232	692	47
14	352	398	852	506	337	588	805	645	256	675	46
15	. 50377	. 86384	. 51877	. 85491	. 53361	. 84573	. 54829	. 83629	. 56280	. 82659	45
16	403	369	902	476	386	557	854	613	305	643	44
17	428	354	927	461	411	542	878	597	329	626	43
18	453	340	952	446	435	526	902	581	353	610	42
19	478	325	977	431	460	511	927	565	377	593	41
20	. 50503	. 86310	. 52002	. 85416	. 53484	. 84495	. 54951	. 83549	. 56401	. 82577	40
21	528	295	026	401	509	480	975	533	425	561	39
22	553	281	051	385	534	464	999	517	449	544	38
23	578	266	076	370	558	448	. 55024	501	473	528	37
24	603	251	101	355	583	433	048	485	497	511	36
25	. 50628	. 86237	. 52126	. 85340	. 53607	. 84417	. 55072	. 83469	. 56521	. 82495	35
26	654	222	151	325	632	402	097	453	545	478	34
27	679	207	175	310	656	386	121	437	569	462	33
28	704	192	200	294	681	370	145	421	593	446	32
29	729	178	225	279	705	355	169	405	617	429	31
30	. 50754	. 86163	. 52250	. 85264	. 53730	. 84339	. 55194	. 83389	. 56641	. 82413	30
31	779	148	275	249	754	324	218	373	665	396	29
32	804	133	299	234	779	308	242	356	689	380	28
33	829	119	324	218	804	292	266	340	713	363	27
34	854	104	349	203	828	277	291	324	736	347	26
35	. 50879	. 86089	. 52374	. 85188	. 53853	. 84261	. 55315	. 83308	. 56760	. 82330	25
36	904	074	399	173	877	245	339	292	784	314	24
37	929	059	423	157	902	230	363	276	808	297	23
38	954	045	448	142	926	214	388	260	832	281	22
39	979	030	473	127	951	198	412	244	856	264	21
40	. 51004	. 86015	. 52498	. 85112	. 53975	. 84182	. 55436	. 83228	. 56880	. 82248	20
41	029	000	522	096	. 54000	167	460	212	904	231	19
42	054	. 85985	547	081	024	151	484	195	928	214	18
43	079	970	572	066	049	135	509	179	952	198	17
44	104	956	597	051	073	120	533	163	976	181	16
45	. 51129	. 85941	. 52621	. 85035	. 54097	. 84104	. 55557	. 83147	. 57000	. 82165	15
46	154	926	646	020	122	088	581	131	024	148	14
47	179	911	671	005	146	072	605	115	047	132	13
48	204	896	696	. 84989	171	057	630	098	071	115	12
49	229	881	720	974	195	041	654	082	095	098	11
50	. 51254	. 85866	. 52745	. 84959	. 54220	. 84025	. 55678	. 83066	. 57119	. 82082	10
51	279	851	770	943	244	009	702	050	143	065	9
52	304	836	794	928	269	. 83994	726	034	167	048	8
53	329	821	819	913	293	978	750	017	191	032	7
54	354	806	844	897	317	962	775	001	215	015	6
55	. 51379	. 85792	. 52869	. 84882	. 54342	. 83946	. 55799	. 82985	. 57238	. 81999	5
56	404	777	893	866	366	930	823	969	262	982	4
57	429	762	918	851	391	915	847	953	286	965	3
58	454	747	943	836	415	899	871	936	310	949	2
59	479	732	967	820	440	883	895	920	334	932	1
60	. 51504	. 85717	. 52992	. 84805	. 54464	. 83867	. 55919	. 82904	. 57358	. 81915	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	59°		58°		57°		56°		55°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	35°		36°		37°		38°		39°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0.57358	0.81915	0.58779	0.80902	0.60182	0.79864	0.61566	0.78801	0.62932	0.77715	60
1	381	899	802	885	205	846	589	783	955	696	59
2	405	882	826	867	228	829	612	765	977	678	58
2	429	865	849	850	251	811	635	747	.63000	660	57
4	453	848	873	833	274	793	658	729	022	641	56
5	.57477	.81832	.58896	.80816	.60298	.79776	.61681	.78711	.63045	.77623	55
6	501	815	920	799	321	758	704	694	068	605	54
7	524	798	943	782	344	741	726	676	090	586	53
8	548	782	967	765	367	723	749	658	113	568	52
9	572	765	990	748	390	706	772	640	135	550	51
10	.57596	.81748	.59014	.80730	.60414	.79688	.61795	.78622	.63158	.77531	50
11	619	731	037	713	437	671	818	604	180	513	49
12	643	714	061	696	460	653	841	586	203	494	48
13	667	698	084	679	483	635	864	568	225	476	47
14	691	681	108	662	506	618	887	550	248	458	46
15	.57715	.81664	.59131	.80644	.60529	.79600	.61909	.78532	.63271	.77439	45
16	738	647	154	627	553	583	932	514	293	421	44
17	762	631	178	610	576	565	955	496	316	402	43
18	786	614	201	593	599	547	978	478	338	384	42
19	810	597	225	576	622	530	.62001	460	361	366	41
20	.57833	.81580	.59248	.80558	.60645	.79512	.62024	.78442	.63383	.77347	40
21	857	563	272	541	668	494	046	424	406	329	39
22	881	546	295	524	691	477	069	405	428	310	38
23	904	530	318	507	714	459	092	387	451	292	37
24	928	513	342	489	738	441	115	369	473	273	36
25	.57952	.81496	.59365	.80472	.60761	.79424	.62138	.78351	.63496	.77255	35
26	976	479	389	455	784	406	160	333	518	236	34
27	999	462	412	438	807	388	183	315	540	218	33
28	.58023	445	436	420	830	371	206	297	563	199	32
29	047	428	459	403	853	353	229	279	585	181	31
30	.58070	.81412	.59482	.80386	.60876	.79335	.62251	.78261	.63608	.77162	30
31	094	395	506	368	899	318	274	243	630	144	29
32	118	378	529	351	922	300	297	225	653	125	28
33	141	361	552	334	945	282	320	206	675	107	27
34	165	344	576	316	968	264	342	188	698	088	26
35	.58189	.81327	.59599	.80299	.60991	.79247	.62365	.78170	.63720	.77070	25
36	212	310	622	282	.61015	229	388	152	742	051	24
37	236	293	646	264	038	211	411	134	765	033	23
38	260	276	669	247	061	193	433	116	787	014	22
39	283	259	693	230	084	176	456	098	810	.76996	21
40	.58307	.81242	.59716	.80212	.61107	.79158	.62479	.78079	.63832	.76977	20
41	330	225	739	195	130	140	502	061	854	959	19
42	354	208	763	178	153	122	524	043	877	940	18
43	378	191	786	160	176	105	547	025	899	921	17
44	401	174	809	143	199	087	570	007	922	903	16
45	.58425	.81157	.59832	.80125	.61222	.79069	.62592	.77988	.63944	.76884	15
46	449	140	856	108	245	051	615	970	966	866	14
47	472	123	879	091	268	033	638	952	989	847	13
48	496	106	902	073	291	016	660	934	.64011	828	12
49	519	089	926	056	314	.78998	683	916	033	810	11
50	.58543	.81072	.59949	.80038	.61337	.78980	.62706	.77897	.64056	.76791	10
51	567	055	972	021	360	962	728	879	078	772	9
52	590	038	995	003	383	944	751	861	100	754	8
53	614	021	.60019	.79986	406	926	774	843	123	735	7
54	637	004	042	968	429	908	796	824	145	717	6
55	.58661	.80987	.60065	.79951	.61451	.78891	.62819	.77806	.64167	.76698	5
56	684	970	089	934	474	873	842	788	190	679	4
57	708	953	112	916	497	855	864	769	212	661	3
58	731	936	135	899	520	837	887	751	234	642	2
59	755	919	158	881	543	819	909	733	256	623	1
60	.58779	.80902	.60182	.79864	.61566	.78801	.62932	.77715	.64279	.76604	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	54°		53°		52°		51°		50°		

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TABLE III.—*Natural sines and cosines*—Continued

M.	40°		41°		42°		43°		44°		
	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	
0	0.64279	0.76604	0.65606	0.75471	0.66913	0.74314	0.68200	0.73135	0.69466	0.71934	60
1	301	586	628	452	935	295	221	116	487	914	59
2	323	567	650	433	956	276	242	096	508	894	58
3	346	548	672	414	978	256	264	076	529	873	57
4	368	530	694	395	999	237	285	056	549	853	56
5	.64390	.76511	.65716	.75375	.67021	.74217	.68306	.73036	.69570	.71833	55
6	412	492	738	356	043	198	327	016	591	813	54
7	435	473	759	337	064	178	349	.72996	612	792	53
8	457	455	781	318	086	159	370	976	633	772	52
9	479	436	803	299	107	139	391	957	654	752	51
10	.64501	.76417	.65825	.75280	.67129	.74120	.68412	.72937	.69675	.71732	50
11	524	398	847	261	151	100	434	917	696	711	49
12	546	380	869	241	172	080	455	897	717	691	48
13	568	361	891	222	194	061	476	877	737	671	47
14	590	342	913	203	215	041	497	857	758	650	46
15	.64612	.76323	.65935	.75184	.67237	.74022	.68518	.72837	.69779	.71630	45
16	635	304	956	165	258	002	539	817	800	610	44
17	657	286	978	146	280	.73983	561	797	821	590	43
18	679	267	.66000	126	301	963	582	777	842	569	42
19	701	248	022	107	323	944	603	757	862	549	41
20	.64723	.76229	.66044	.75088	.67344	.73924	.68624	.72737	.69883	.71529	40
21	746	210	066	069	366	904	645	717	904	508	39
22	768	192	088	050	387	885	666	697	925	488	38
23	790	173	109	030	409	865	688	677	946	468	37
24	812	154	131	011	430	846	709	657	966	447	36
25	.64834	.76135	.66153	.74992	.67452	.73826	.68730	.72637	.69987	.71427	35
26	856	116	175	973	473	806	751	617	.70008	407	34
27	878	097	197	953	495	787	772	597	029	386	33
28	901	078	218	934	516	767	793	577	049	366	32
29	923	059	240	915	538	747	814	557	070	345	31
30	.64945	.76041	.66262	.74896	.67559	.73728	.68835	.72537	.70091	.71325	30
31	967	022	284	876	580	708	857	517	112	305	29
32	989	003	306	857	602	688	878	497	132	284	28
33	.65011	.75984	327	838	623	669	899	477	153	264	27
34	033	965	349	818	645	649	920	457	174	243	26
35	.65055	.75946	.66371	.74799	.67666	.73629	.68941	.72437	.70195	.71223	25
36	077	927	393	780	688	610	962	417	215	203	24
37	100	908	414	760	709	590	983	397	236	182	23
38	122	889	436	741	730	570	.69004	377	257	162	22
39	144	870	458	722	752	551	025	357	277	141	21
40	.65166	.75851	.66480	.74703	.67773	.73531	.69046	.72337	.70298	.71121	20
41	188	832	501	683	795	511	067	317	319	100	19
42	210	813	523	664	816	491	088	297	339	080	18
43	232	794	545	644	837	472	109	277	360	059	17
44	254	775	566	625	859	452	130	257	381	039	16
45	.65276	.75756	.66588	.74606	.67880	.73432	.69151	.72236	.70401	.71019	15
46	298	738	610	586	901	413	172	216	422	.70998	14
47	320	719	632	567	923	393	193	196	443	978	13
48	342	700	653	548	944	373	214	176	463	957	12
49	364	680	675	528	965	353	235	156	484	937	11
50	.65386	.75661	.66697	.74509	.67987	.73333	.69256	.72136	.70505	.70916	10
51	408	642	718	489	.68008	314	277	116	525	896	9
52	430	623	740	470	029	294	298	095	546	875	8
53	452	604	762	451	051	274	319	075	567	855	7
54	474	585	783	431	072	254	340	055	587	834	6
55	.65496	.75566	.66805	.74412	.68093	.73234	.69361	.72035	.70608	.70813	5
56	518	547	827	392	115	215	382	015	628	793	4
57	540	528	848	373	136	195	403	.71995	649	772	3
58	562	509	870	353	157	175	424	974	670	752	2
59	584	490	891	334	179	155	445	954	690	731	1
60	.65606	.75471	.66913	.74314	.68200	.73135	.69466	.71934	.70711	.70711	0
	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	Cos.	Sin.	M.
	49°		48°		47°		46°		45°		

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TABLE IV

NATURAL TANGENTS AND COTANGENTS

(For every minute of the quadrant.)

M	0°		1°		2°		3°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.00000	0	0.01746	57.2900	0.03492	28.6363	0.05241	19.0811	60
1	029	3437.75	775	56.3506	521	.3994	270	18.9755	59
2	058	1718.87	804	55.4415	550	.1664	299	.8711	58
3	087	1145.92	833	54.5613	579	27.9372	328	.7678	57
4	116	859.436	862	53.7086	609	.7117	357	.6656	56
5	.00145	687.549	.01891	52.8821	.03638	27.4899	.05387	18.5645	55
6	175	572.957	920	52.0807	667	.2715	416	.4645	54
7	204	491.106	949	51.3032	696	.0566	445	.3655	53
8	233	429.718	978	50.5485	725	26.8450	474	.2677	52
9	262	381.971	.02007	49.8157	754	.6367	503	.1708	51
10	.00291	343.774	.02036	49.1039	.03783	26.4316	.05533	18.0750	50
11	320	312.521	066	48.4121	812	.2296	562	17.9802	49
12	349	286.478	095	47.7395	842	.0307	591	.8863	48
13	378	264.441	124	47.0853	871	25.8348	620	.7934	47
14	407	245.552	153	46.4489	900	.6418	649	.7015	46
15	.00436	229.182	.02182	45.8294	.03929	25.4517	.05678	17.6106	45
16	465	214.858	211	45.2261	958	.2644	708	.5205	44
17	495	202.219	240	44.6386	987	.0798	737	.4314	43
18	524	190.984	269	44.0661	.04016	24.8978	766	.3432	42
19	553	180.932	298	43.5081	046	.7185	795	.2558	41
20	.00582	171.885	.02328	42.9641	.04075	24.5418	.05824	17.1693	40
21	611	163.700	357	42.4335	104	.3675	854	.0837	39
22	640	156.259	386	41.9158	133	.1957	883	16.9990	38
23	669	149.465	415	41.4106	162	.0263	912	.9150	37
24	698	143.237	444	40.9174	191	23.8593	941	.8319	36
25	.00727	137.507	.02473	40.4358	.04220	23.6945	.05970	16.7496	35
26	756	132.219	502	39.9655	250	.5321	999	.6681	34
27	785	127.321	531	39.5059	279	.3718	.06029	.5874	33
28	815	122.774	560	39.0568	308	.2137	058	.5075	32
29	844	118.540	589	38.6177	337	.0577	087	.4283	31
30	.00873	114.589	.02619	38.1885	.04366	22.9038	.06116	16.3499	30
31	902	110.892	648	37.7686	395	.7519	145	.2722	29
32	931	107.426	677	37.3579	424	.6020	175	.1952	28
33	960	104.171	706	36.9560	454	.4541	204	.1190	27
34	989	101.107	735	36.5627	483	.3081	233	.0435	26
35	.01018	98.2179	.02764	36.1776	.04512	22.1640	.06262	15.9687	25
36	047	95.4895	793	35.8006	541	.0217	291	.8945	24
37	076	92.9085	822	35.4313	570	21.8813	321	.8211	23
38	105	90.4633	851	35.0695	599	.7426	350	.7483	22
39	135	88.1436	881	34.7151	628	.6056	379	.6762	21
40	.01164	85.9398	.02910	34.3678	.04658	21.4704	.06408	15.6048	20
41	193	83.8435	939	34.0273	687	.3369	438	.5340	19
42	222	81.8470	968	33.6935	716	.2049	467	.4638	18
43	251	79.9434	997	33.3662	745	.0747	496	.3943	17
44	280	78.1263	.03026	33.0452	774	20.9460	525	.3254	16
45	.01309	76.3900	.03055	32.7303	.04803	20.8188	.06554	15.2571	15
46	338	74.7292	084	32.4213	833	.6932	584	.1893	14
47	367	73.1390	114	32.1181	862	.5691	613	.1222	13
48	396	71.6151	143	31.8205	891	.4465	642	.0557	12
49	425	70.1533	172	31.5284	920	.3253	671	14.9898	11
50	.01455	68.7501	.03201	31.2416	.04949	20.2056	.06700	14.9244	10
51	484	67.4019	230	30.9599	978	.0872	730	.8596	9
52	513	66.1055	259	30.6833	.05007	19.9702	759	.7954	8
53	542	64.8580	288	30.4116	037	.8546	788	.7317	7
54	571	63.6567	317	30.1446	066	.7403	817	.6685	6
55	.01600	62.4992	.03346	29.8823	.05095	19.6273	.06847	14.6059	5
56	629	61.3829	376	29.6245	124	.5156	876	.5438	4
57	658	60.3058	405	29.3711	153	.4051	905	.4823	3
58	687	59.2659	434	29.1220	182	.2959	934	.4212	2
59	716	58.2612	463	28.8771	212	.1879	963	.3607	1
60	.01746	57.2900	.03492	28.6363	.05241	19.0811	.06993	14.3007	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	89°		88°		87°		86°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	4°		5°		6°		7°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.06993	14.3007	0.08749	11.4301	0.10510	9.51436	0.12278	8.14435	60
1	.07022	.2411	778	.3919	540	.48781	308	.12481	59
2	051	.1821	807	.3540	569	.46141	338	.10536	58
3	080	.1235	837	.3163	599	.43515	367	.08600	57
4	110	.0655	866	.2789	628	.40904	397	.06674	56
5	.07139	14.0079	.08895	11.2417	.10657	9.38307	.12426	8.04756	55
6	168	13.9507	925	.2048	687	.35724	456	.02848	54
7	197	.8940	954	.1681	716	.33155	485	.00948	53
8	227	.8378	983	.1316	746	.30599	515	7.99058	52
9	256	.7821	.09013	.0954	775	.28058	544	.97176	51
10	.07285	13.7267	.09042	11.0594	.10805	9.25530	.12574	7.95302	50
11	314	.6719	071	.0237	834	.23016	603	.93438	49
12	344	.6174	101	10.9882	863	.20516	633	.91582	48
13	373	.5634	130	.9529	893	.18028	662	.89734	47
14	402	.5098	159	.9178	922	.15554	692	.87895	46
15	.07431	13.4566	.09189	10.8829	.10952	9.13093	.12722	7.86064	45
16	461	.4039	218	.8483	981	.10646	751	.84242	44
17	490	.3515	247	.8139	.11011	.08211	781	.82428	43
18	519	.2996	277	.7797	040	.05789	810	.80622	42
19	548	.2480	306	.7457	070	.03379	840	.78825	41
20	.07578	13.1969	.09335	10.7119	.11099	9.00983	.12869	7.77035	40
21	607	.1461	365	.6783	128	8.98598	899	.75254	39
22	636	.0958	394	.6450	158	.96227	929	.73480	38
23	665	.0458	423	.6118	187	.93867	958	.71715	37
24	695	12.9962	453	.5789	217	.91520	988	.69957	36
25	.07724	12.9469	.09482	10.5462	.11246	8.89185	.13017	7.68208	35
26	753	.8981	511	.5136	276	.86862	047	.66466	34
27	782	.8496	541	.4813	305	.84551	076	.64732	33
28	812	.8014	570	.4491	335	.82252	106	.63005	32
29	841	.7536	600	.4172	364	.79964	136	.61287	31
30	.07870	12.7062	.09629	10.3854	.11394	8.77689	.13165	7.59575	30
31	899	.6591	658	.3538	423	.75425	195	.57872	29
32	929	.6124	688	.3224	452	.73172	224	.56176	28
33	958	.5660	717	.2913	482	.70931	254	.54487	27
34	987	.5199	746	.2602	511	.68701	284	.52806	26
35	.08017	12.4742	.09776	10.2294	.11541	8.66482	.13313	7.51132	25
36	046	.4288	805	.1988	570	.64275	343	.49465	24
37	075	.3838	834	.1683	600	.62078	372	.47806	23
38	104	.3390	864	.1381	629	.59893	402	.46154	22
39	134	.2946	893	.1080	659	.57718	432	.44509	21
40	.08163	12.2505	.09923	10.0780	.11688	8.55555	.13461	7.42871	20
41	192	.2067	952	.0483	718	.53402	491	.41240	19
42	221	.1632	981	.0187	747	.51259	521	.39616	18
43	251	.1201	.10011	9.98931	777	.49128	550	.37999	17
44	280	.0772	040	.96007	806	.47007	580	.36389	16
45	.08309	12.0346	.10069	9.93101	.11836	8.44896	.13609	7.34786	15
46	339	11.9923	099	.90211	865	.42795	639	.33190	14
47	368	.9504	128	.87338	895	.40705	669	.31600	13
48	397	.9087	158	.84482	924	.38625	698	.30018	12
49	427	.8673	187	.81641	954	.36555	728	.28442	11
50	.08456	11.8262	.10216	9.78817	.11983	8.34496	.13758	7.26873	10
51	485	.7853	246	.76009	.12013	.32446	787	.25310	9
52	514	.7448	275	.73217	042	.30406	817	.23754	8
53	544	.7045	305	.70441	072	.28376	846	.22204	7
54	573	.6645	334	.67680	101	.26355	876	.20661	6
55	.08602	11.6248	.10363	9.64935	.12131	8.24345	.13906	7.19125	5
56	632	.5853	393	.62205	160	.22344	935	.17594	4
57	661	.5461	422	.59490	190	.20352	965	.16071	3
58	690	.5072	452	.56791	219	.18370	995	.14553	2
59	720	.4685	481	.54106	249	.16398	.14024	.13042	1
60	.08749	11.4301	.10510	9.51436	.12278	8.14435	.14054	7.11537	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	85°		84°		83°		82°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	8°		9°		10°		11°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.14054	7.11537	0.15838	6.31375	0.17633	5.67128	0.19438	5.14455	60
1	084	.10038	868	.30189	663	.66165	468	.13658	59
2	113	.08546	898	.29007	693	.65205	498	.12862	58
3	143	.07059	928	.27829	723	.64248	529	.12069	57
4	173	.05579	958	.26655	753	.63295	559	.11279	56
5	.14202	7.04105	.15988	6.25486	.17783	5.62344	.19589	5.10490	55
6	232	.02637	.16017	.24321	813	.61397	619	.09704	54
7	262	.01174	047	.23160	843	.60452	649	.08921	53
8	291	6.99718	077	.22003	873	.59511	680	.08139	52
9	321	.98268	107	.20851	903	.58573	710	.07360	51
10	.14351	6.96823	.16137	6.19703	.17933	5.57638	.19740	5.06584	50
11	381	.95385	167	.18559	963	.56706	770	.05809	49
12	410	.93952	196	.17419	993	.55777	801	.05037	48
13	440	.92525	226	.16283	.18023	.54851	831	.04267	47
14	470	.91104	256	.15151	053	.53927	861	.03499	46
15	.14499	6.89688	.16286	6.14023	.18083	5.53007	.19891	5.02734	45
16	529	.88278	316	.12899	113	.52090	921	.01971	44
17	559	.86874	346	.11779	143	.51176	952	.01210	43
18	588	.85475	376	.10664	173	.50264	982	.00451	42
19	618	.84082	405	.09552	203	.49356	.20012	4.99695	41
20	.14648	6.82694	.16435	6.08444	.18233	5.48451	.20042	4.98940	40
21	678	.81312	465	.07340	263	.47548	073	.98188	39
22	707	.79936	495	.06240	293	.46648	103	.97438	38
23	737	.78564	525	.05143	323	.45751	133	.96690	37
24	767	.77199	555	.04051	353	.44857	164	.95945	36
25	.14796	6.75838	.16585	6.02962	.18384	5.43966	.20194	4.95201	35
26	826	.74483	615	.01878	414	.43077	224	.94460	34
27	856	.73133	645	.00797	444	.42192	254	.93721	33
28	886	.71789	674	5.99720	474	.41309	285	.92984	32
29	915	.70450	704	.98646	504	.40429	315	.92249	31
30	.14945	6.69116	.16734	5.97576	.18534	5.39552	.20345	4.91516	30
31	975	.67787	764	.96510	564	.38677	376	.90785	29
32	.15005	.66463	794	.95448	594	.37805	406	.90056	28
33	034	.65144	824	.94390	624	.36936	436	.89330	27
34	064	.63831	854	.93335	654	.36070	466	.88605	26
35	.15094	6.62523	.16884	5.92283	.18684	5.35206	.20497	4.87882	25
36	124	.61219	914	.91236	714	.34345	527	.87162	24
37	153	.59921	944	.90191	745	.33487	557	.86444	23
38	183	.58627	974	.89151	775	.32631	588	.85727	22
39	213	.57339	.17004	.88114	805	.31778	618	.85013	21
40	.15243	6.56055	.17033	5.87080	.18835	5.30928	.20648	4.84300	20
41	272	.54777	063	.86051	865	.30080	679	.83590	19
42	302	.53503	093	.85024	895	.29235	709	.82882	18
43	332	.52234	123	.84001	925	.28393	739	.82175	17
44	362	.50970	153	.82982	955	.27553	770	.81471	16
45	.15391	6.49710	.17183	5.81966	.18986	5.26715	.20800	4.80769	15
46	421	.48456	213	.80953	.19016	.25880	830	.80068	14
47	451	.47206	243	.79944	046	.25048	861	.79370	13
48	481	.45961	273	.78938	076	.24218	891	.78673	12
49	511	.44720	303	.77936	106	.23391	921	.77978	11
50	.15540	6.43484	.17333	5.76937	.19136	5.22566	.20952	4.77286	10
51	570	.42253	363	.75941	166	.21744	982	.76595	9
52	600	.41026	393	.74949	197	.20925	.21013	.75906	8
53	630	.39804	423	.73960	227	.20107	043	.75219	7
54	660	.38587	453	.72974	257	.19293	073	.74534	6
55	.15689	6.37374	.17483	5.71992	.19287	5.18480	.21104	4.73851	5
56	719	.36165	513	.71013	317	.17671	134	.73170	4
57	749	.34961	543	.70037	347	.16863	164	.72490	3
58	779	.33761	573	.69064	378	.16058	195	.71813	2
59	809	.32566	603	.68094	408	.15256	225	.71137	1
60	.15838	6.31375	.17633	5.67128	.19438	5.14455	.21256	4.70463	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	81°		80°		79°		78°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	12°		13°		14°		15°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.21256	4.70463	0.23087	4.33158	0.24933	4.01078	0.26795	3.73205	60
1	286	.69791	117	.32573	964	.00582	826	.72771	59
2	316	.69121	148	.32001	995	.00086	857	.72338	58
3	347	.68452	179	.31430	.25026	3.99592	888	.71907	57
4	377	.67786	209	.30860	056	.99099	920	.71476	56
5	.21408	4.67121	.23240	4.30291	.25087	3.98607	.26951	3.71046	55
6	438	.66458	271	.29724	118	.98117	982	.70616	54
7	469	.65797	301	.29159	149	.97627	.27013	.70188	53
8	499	.65138	332	.28595	180	.97139	044	.69761	52
9	529	.64480	363	.28032	211	.96651	076	.69335	51
10	.21560	4.63825	.23393	4.27471	.25242	3.96165	.27107	3.68909	50
11	590	.63171	424	.26911	273	.95680	138	.68485	49
12	621	.62518	455	.26352	304	.95196	169	68061	48
13	651	.61868	485	.25795	335	.94713	201	.67638	47
14	682	.61219	516	.25239	366	.94232	232	.67217	46
15	.21712	4.60572	.23547	4.24685	.25397	3.93751	.27263	3.66796	45
16	743	.59927	578	.24132	428	.93721	294	.66376	44
17	773	.59283	608	.23580	459	.92793	326	.65957	43
18	804	.58641	639	.23030	490	.92316	357	.65538	42
19	834	.58001	670	.22841	521	.91839	388	.65121	41
20	.21864	4.57363	.23700	4.21933	.25552	3.91364	.27419	3.64705	40
21	895	.56726	731	.21387	583	.90890	451	.64289	39
22	925	.56091	762	.20842	614	.90417	482	.63874	38
23	956	.55458	793	.20298	645	.89945	513	.63461	37
24	986	.54826	823	.19756	676	.89474	545	.63048	36
25	.22017	4.54196	.23854	4.19215	.25707	3.89004	.27576	3.62636	35
26	047	.53568	885	.18675	738	.88536	607	.62224	34
27	078	.52941	916	.18137	769	.88068	638	.61814	33
28	108	.52316	946	.17600	800	.87601	670	.61405	32
29	139	.51693	977	.17064	831	.87136	701	.60996	31
30	.22169	4.51071	.24008	4.16530	.25862	3.86671	.27732	3.60588	30
31	200	.50451	039	.15997	893	.86208	764	.60181	29
32	231	.49832	69	.15465	924	.85745	795	.59775	28
33	261	.49215	100	.14934	955	.85284	826	.59370	27
34	292	.48600	131	.14405	986	.84824	858	.58966	26
35	.22322	4.47986	.24162	4.13877	.26017	3.84364	.27889	3.58562	25
36	353	.47374	193	.13350	048	.83906	921	.58160	24
37	383	.46764	223	.12825	079	.83449	952	.57758	23
38	414	.46155	254	.12301	110	.82992	983	.57357	22
39	444	.45548	285	.11778	141	.82537	.28015	.56957	21
40	.22475	4.44942	.24316	4.11256	.26172	3.82083	.28046	3.56557	20
41	505	.44338	347	.10736	203	.81630	077	.56159	19
42	536	.43735	377	.10216	235	.81177	109	.55761	18
43	567	.43134	408	.09699	266	.80726	140	.55364	17
44	597	.42534	439	.09182	297	.80276	172	.54968	16
45	.22628	4.41936	.24470	4.08666	.26328	3.79827	.28203	3.54573	15
46	658	.41340	501	.08152	359	.79378	234	.54179	14
47	689	.40745	532	.07639	390	.78931	266	.53785	13
48	719	.40152	562	.07127	421	.78485	297	.53393	12
49	750	.39560	593	.06616	452	.78040	329	.53001	11
50	.22781	4.38969	.24624	4.06107	.26483	3.77595	.28360	3.52609	10
51	811	.38381	655	.05599	515	.77152	391	.52219	9
52	842	.37793	686	.05092	546	.76709	423	.51829	8
53	872	.37207	717	.04586	577	.76268	454	.51441	7
54	903	.36623	747	.04081	608	.75828	486	.51053	6
55	.22934	4.36040	.24778	4.03578	.26639	3.75388	.28517	3.50666	5
56	964	.35459	809	.03076	670	.74950	549	.50279	4
57	995	.34879	840	.02574	701	.74512	580	.49894	3
58	.23026	.34300	871	.02074	733	.74075	612	.49509	2
59	056	.33723	902	.01576	764	.73640	643	.49125	1
60	.23087	4.33148	.24933	4.01078	.26795	3.73205	.28675	3.48741	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	77°		76°		75°		74°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	16°		17°		18°		19°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.28675	3.48741	0.30573	3.27085	0.32492	3.07768	0.34433	2.90421	60
1	706	.48359	605	.26745	524	.07464	465	.90147	59
2	738	.47927	637	.26406	556	.07160	498	.89873	58
3	769	.47596	669	.26067	588	.06857	530	.89600	57
4	801	.47216	700	.25729	621	.06554	563	.89327	56
5	.28832	3.46837	.30732	3.25392	.32653	3.06252	.34596	2.89055	55
6	864	.46458	764	.25055	685	.05950	628	.88783	54
7	895	.46080	796	.24719	717	.05649	661	.88511	53
8	927	.45705	828	.24383	749	.05349	693	.88240	52
9	958	.45327	860	.24049	782	.05049	726	.87970	51
10	.28990	3.44951	.30891	3.23714	.32814	3.04749	.34758	2.87700	50
11	.29021	.44576	923	.23381	846	.04450	791	.87430	49
12	053	.44202	955	.23048	878	.04152	824	.87161	48
13	084	.43829	987	.22715	911	.03854	856	.86892	47
14	116	.43456	.31019	.22384	943	.03556	889	.86624	46
15	.29147	3.43084	.31051	3.22053	.32975	3.03260	.34922	2.86356	45
16	179	.42713	083	.21722	.33007	.02963	954	.86089	44
17	210	.42343	115	.21392	040	.02607	987	.85822	43
18	242	.41973	147	.21063	072	.02372	.35020	.85555	42
19	274	.41604	178	.20734	104	.02077	052	.85289	41
20	.29305	3.41236	.31210	3.20406	.33136	3.01783	.35085	2.85023	40
21	337	.40869	242	.20079	169	.01489	118	.84758	39
22	368	.40502	274	.19752	201	.01196	150	.84494	38
23	400	.40136	300	.19426	233	.00903	183	.84229	37
24	432	.39771	338	.19100	266	.00611	216	.83965	36
25	.29463	3.39406	.31370	3.18775	.33298	3.00319	.35248	2.83702	35
26	495	.39042	402	.18451	330	.00028	281	.83439	34
27	526	.38679	434	.18127	363	2.99738	314	.83176	33
28	558	.38317	466	.17804	395	.99447	346	.82914	32
29	590	.37955	498	.17481	427	.99158	379	.82653	31
30	.29621	3.37594	.31530	3.17159	.33460	2.98868	.35412	2.82391	30
31	653	.37234	562	.16838	492	.98560	445	.82130	29
32	685	.36875	594	.16517	524	.98292	477	.81870	28
33	716	.36516	626	.16197	557	.98004	510	.81610	27
34	748	.36158	658	.15877	589	.97717	543	.81350	26
35	.29780	3.35800	.31690	3.15558	.33621	2.97430	.35576	2.81091	25
36	811	.35443	722	.15140	654	.97144	608	.80633	24
37	843	.35087	754	.14922	686	.96858	641	.80574	23
38	875	.34732	786	.14605	718	.96573	674	.80316	22
39	906	.34377	818	.14288	751	.96288	707	.80059	21
40	.29938	3.34023	.31850	3.13972	.33783	2.96004	.35740	2.79802	20
41	970	.33670	882	.13656	816	.95721	772	.79545	19
42	.30001	.33317	914	.13341	848	.95437	805	.79289	18
43	033	.32965	946	.13027	881	.95155	838	.79033	17
44	065	.32614	978	.12713	913	.94872	871	.78778	16
45	.30097	3.32264	.32010	3.12400	.33945	2.94591	.35904	2.78523	15
46	128	.31914	042	.12087	978	.94309	937	.78269	14
47	160	.31565	074	.11775	.34010	.94028	969	.78014	13
48	192	.31216	106	.11464	043	.93748	.36002	.77761	12
49	224	.30868	139	.11153	075	.93468	035	.77507	11
50	.30255	3.30521	.32171	3.10842	.34108	2.93189	.36068	2.77254	10
51	287	.30174	203	.10532	140	.92910	101	.77002	9
52	319	.29829	235	.10223	173	.92632	134	.76750	8
53	351	.29483	267	.09914	205	.92354	167	.76498	7
54	382	.29139	299	.09606	238	.92076	199	.76247	6
55	.30414	3.28795	.32331	3.09298	.34270	2.91799	.36232	2.75996	5
56	446	.28452	363	.08991	303	.91523	265	.75746	4
57	478	.28109	396	.08685	335	.91246	298	.75496	3
58	509	.27767	428	.08379	368	.90971	331	.75246	2
59	541	.27426	460	.08073	400	.90696	364	.74997	1
60	.30573	3.27085	.32492	3.07768	.34433	2.90421	.36397	2.74748	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	73°		72°		71°		70°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	20°		21°		22°		23°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.36397	2.74748	0.38386	2.60509	0.40403	2.47509	0.42447	2.35585	60
1	430	.74499	420	.60283	436	.47302	482	.35395	59
2	364	.74251	453	.60057	470	.47095	516	.35205	58
3	496	.74004	487	.59831	504	.46888	551	.35015	57
4	529	.73756	520	.59606	538	.46682	585	.34825	56
5	.36562	2.73509	.38553	2.59381	.40572	2.46476	.42619	2.34636	55
6	595	.73263	587	.59156	606	.46270	654	.34447	54
7	628	.73017	620	.58932	640	.46065	688	.34258	53
8	661	.72771	654	.58708	674	.45860	722	.34069	52
9	694	.72526	687	.58484	707	.45655	757	.33881	51
10	.36727	2.72281	.38721	2.58261	.40741	2.45451	.42791	2.33693	50
11	760	.72036	754	.58038	775	.45246	826	.33505	49
12	793	.71792	787	.57815	809	.45043	860	.33317	48
13	826	.71548	821	.57593	843	.44839	894	.33130	47
14	859	.71305	854	.57371	877	.44636	929	.32943	46
15	.36892	2.71062	.38888	2.57150	.40911	2.44433	.42963	2.32756	45
16	925	.70819	921	.56928	945	.44230	998	.32570	44
17	958	.70577	955	.56707	979	.44027	.43032	.32383	43
18	991	.70335	988	.56487	.41013	.43825	067	.32197	42
19	.37024	.70094	.39022	.56266	047	.43623	101	.32012	41
20	.37057	2.69853	.39055	2.56046	.41081	2.43422	.43136	2.31826	40
21	090	.69612	089	.55827	115	.43220	170	.31641	39
22	123	.69371	122	.55608	149	.43019	205	.31456	38
23	157	.69131	156	.55389	183	.42819	239	.31271	37
24	190	.68892	190	.55170	217	.42618	274	.31086	36
25	.37223	2.68653	.39223	2.54952	.41251	2.42418	.43308	2.30902	35
26	256	.68414	257	.54734	285	.42218	343	.30718	34
27	289	.68175	290	.54516	319	.42019	378	.30534	33
28	322	.67937	324	.54299	353	.41819	412	.30351	32
29	355	.67700	357	.54082	387	.41620	447	.30167	31
30	.37388	2.67462	.39391	2.53865	.41421	2.41421	.43481	2.29984	30
31	422	.67225	425	.53648	455	.41223	516	.29801	29
32	455	.66989	458	.53432	490	.41025	550	.29619	28
33	488	.66752	492	.53217	524	.40827	585	.29437	27
34	521	.66516	526	.53001	558	.40629	620	.29254	26
35	.37554	2.66281	.39559	2.52786	.41592	2.40432	.43654	2.29073	25
36	588	.66046	593	.52571	626	.40235	689	.28891	24
37	621	.65811	626	.52357	660	.40038	724	.28710	23
38	654	.65576	660	.52142	694	.39841	758	.28528	22
39	687	.65342	694	.51929	728	.39645	793	.28348	21
40	.37720	2.65109	.39727	2.51715	.41763	2.39449	.43828	2.28167	20
41	754	.64875	761	.51502	797	.39253	862	.27987	19
42	787	.64642	795	.51289	831	.39058	897	.27806	18
43	820	.64410	829	.51076	865	.38863	932	.27626	17
44	853	.64177	862	.50864	899	.38668	966	.27447	16
45	.37887	2.63945	.39896	2.50652	.41933	2.38473	.44001	2.27267	15
46	920	.63714	930	.50440	968	.38279	036	.27088	14
47	953	.63483	963	.50229	.42002	.38084	071	.26909	13
48	986	.63252	997	.50018	036	.37891	105	.26730	12
49	.38020	.63021	.40031	.49807	070	.37697	140	.26552	11
50	.38053	2.62791	.40065	2.49597	.42105	2.37594	.44175	2.26374	10
51	086	.62561	098	.49386	139	.37311	210	.26196	9
52	120	.62332	132	.49177	173	.37118	244	.26018	8
53	153	.62103	166	.48967	207	.36925	279	.25840	7
54	186	.61874	200	.48758	242	.36733	314	.25663	6
55	.38220	2.61646	.40234	2.48549	.42276	2.36541	.44349	2.25486	5
56	253	.61418	267	.48340	310	.36349	384	.25309	4
57	286	.61190	301	.48132	345	.36158	418	.25132	3
58	320	.60963	335	.47924	379	.35967	453	.24956	2
59	353	.60736	369	.47716	413	.35776	488	.24780	1
60	.38386	2.60509	.40403	2.47509	.42447	2.35585	.44523	2.24604	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	69°		68°		67°		66°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	24°		25°		26°		27°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.44523	2.24604	0.46631	2.14451	0.48773	2.05030	0.50953	1.96261	60
1	558	.24428	666	14288	809	.04879	989	.96120	59
2	593	.24252	702	.14125	845	.04728	.51026	.95979	58
3	627	.24077	737	.13963	881	.04577	063	.95838	57
4	662	.23902	772	.13801	917	.04426	099	.95698	56
5	.44697	2.23727	.46808	2.13639	.48953	2.04276	.51136	1.95557	55
6	732	.23553	843	.13477	989	.04125	173	.95417	54
7	767	.23378	879	.13316	.49026	.03975	209	.95277	53
8	802	.23204	914	.13154	062	.03825	246	.95137	52
9	837	.23030	950	.12993	098	.03675	283	.94997	51
10	.44872	2.22857	46985	2.12832	.49134	2.03526	.51319	1.94858	50
11	907	.22683	.47021	.12671	170	.03376	356	.94718	49
12	942	.22510	056	.12511	206	.03227	393	.94579	48
13	977	.22337	092	.12350	242	.03078	430	.94440	47
14	.45012	.22164	128	.12190	278	.02929	467	.94301	46
15	.45047	2.21992	.47163	2.12030	.49315	2.02780	.51503	1.94162	45
16	082	.21819	199	.11871	351	.02631	540	.94023	44
17	117	.21647	234	.11711	387	.02483	577	.93885	43
18	152	.21475	270	.11552	423	.02335	614	.93746	42
19	187	.21304	305	.11392	459	.02187	651	.93608	41
20	.45222	2.21132	.47341	2.11233	.49495	2.02039	.51688	1.93470	40
21	257	.20961	377	.11075	532	.01891	724	.93332	39
22	292	.20790	412	.10916	568	.01743	761	.93195	38
23	327	.20619	448	.10758	604	.01596	798	.93057	37
24	362	.20449	483	.10600	640	.01499	835	.92920	36
25	.45397	2.20278	.47519	2.10442	.49677	2.01302	.51872	1.92782	35
26	432	.20108	555	.10284	713	.01155	909	.92645	34
27	467	.19938	590	.10126	749	.01008	946	.92508	33
28	502	.19769	626	.09969	786	.00862	983	.92371	32
29	538	.19599	662	.09811	822	.00715	.52020	.92235	31
30	.45573	2.19430	.47698	2.09654	.49858	2.00569	.52057	1.92098	30
31	608	.19261	733	.09498	894	.00423	094	.91962	29
32	643	.19092	769	.09341	931	.00277	131	.91826	28
33	678	.18923	805	.09184	967	.00131	168	.91690	27
34	713	.18755	840	.09028	.50004	1.99986	205	.91554	26
35	.45748	2.18587	.47876	2.08872	.50040	1.99841	.52242	1.91418	25
36	784	.18419	912	.08716	076	.99695	279	.91282	24
37	819	.18251	948	.08560	113	.99550	316	.91147	23
38	854	.18084	984	.08405	149	.99406	353	.91012	22
39	889	.17916	.48019	08250	185	.99261	390	.90876	21
40	.45924	2.17749	.48055	2.08094	.50222	1.99116	.52427	1.90741	20
41	960	.17582	091	.07939	258	.98972	464	.90607	19
42	995	.17416	127	.07785	295	.98828	501	.90472	18
43	.46030	.17249	163	.07630	331	.98684	538	.90337	17
44	065	.17083	198	.07476	368	.98540	575	.90203	16
45	.46101	2.16917	.48234	2.07321	.50404	1.98396	.52613	1.90069	15
46	136	.16751	270	.07167	441	.98253	650	.89935	14
47	171	.16585	306	.07014	477	.98110	687	.89801	13
48	206	.16420	342	.06860	514	.97966	724	.89667	12
49	242	.16255	378	.06706	550	.97823	761	.89533	11
50	.46277	2.16090	.48414	2.06553	.50587	1.97681	.52798	1.89400	10
51	312	.15925	450	.06400	623	.97538	836	.89266	9
52	348	.15760	486	.06247	660	.97395	873	.89133	8
53	383	.15596	521	.06094	696	.97253	910	.89000	7
54	418	.15432	557	.05942	733	.97111	947	.88867	6
55	.46454	2.15268	.48593	2.05790	.50769	1.96969	.52985	1.88734	5
56	489	.15104	629	.05637	806	.96827	.53022	.88602	4
57	525	.14940	665	.05485	843	.96685	059	.88469	3
58	560	.14777	701	.05333	879	.96544	096	.88337	2
59	595	.14614	737	.05182	916	.96402	134	.88205	1
60	.46631	2.14451	.48773	2.05030	.50953	1.96261	.53171	1.88073	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	65°		64°		63°		62°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	28°		29°		30°		31°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.53171	1.88073	0.55431	1.80405	0.57735	1.73205	0.60086	1.66428	60
1	208	.87941	469	.80281	774	.73089	126	.66318	59
2	246	.87809	507	.80158	813	.72973	165	.66209	58
3	283	.87677	545	.80034	851	.72857	205	.66099	57
4	320	.87546	583	.79911	890	.72741	245	.65990	56
5	.53358	1.87415	.55621	1.79788	.57929	1.72625	.60284	1.65881	55
6	395	.87283	659	.79665	968	.72509	324	.65772	54
7	432	.87152	697	.79542	.58007	.72393	364	.65663	53
8	470	.87021	736	.79419	046	.72278	403	.65554	52
9	507	.86891	774	.79296	085	.72163	443	.65445	51
10	.53545	1.86760	.55812	1.79174	.58124	1.72047	.60483	1.65337	50
11	582	.86630	850	.79051	162	.71932	522	.65228	49
12	620	.86499	888	.78929	201	.71817	562	.65120	48
13	657	.86369	926	.78807	240	.71702	602	.65011	47
14	694	.86239	964	.78685	279	.71588	642	.64903	46
15	.53732	1.86109	.56003	1.78563	.58318	1.71473	.60681	1.64795	45
16	769	.85979	041	.78441	357	.71358	721	.64687	44
17	807	.85850	079	.78319	396	.71244	761	.64579	43
18	844	.85720	117	.78198	435	.71129	801	.64471	42
19	882	.85591	156	.78077	474	.71015	841	.64363	41
20	.53920	1.85462	.56194	1.77955	.58513	1.70901	.60881	1.64256	40
21	957	.85333	232	.77834	552	.70787	921	.64148	39
22	995	.85204	270	.77713	591	.70673	960	.64041	38
23	.54032	.85075	309	.77592	631	.70560	.61000	.63934	37
24	070	.84946	347	.77471	670	.70446	040	.63826	36
25	.54107	1.84818	.56385	1.77351	.58709	1.70332	.61080	1.63719	35
26	145	.84689	424	.77230	748	.70219	120	.63612	34
27	183	.84561	462	.77110	787	.70106	160	.63505	33
28	220	.84433	501	.76990	826	.69992	200	.63398	32
29	258	.84305	539	.76869	865	.69879	240	.63292	31
30	.54296	1.84177	.56577	1.76749	.58905	1.69766	.61280	1.63185	30
31	333	.84049	616	.76629	944	.69653	320	.63079	29
32	371	.83922	654	.76510	983	.69541	360	.62972	28
33	409	.83794	693	.76390	.59022	.69428	400	.62866	27
34	446	.83667	731	.76271	061	.69316	440	.62760	26
35	.54484	1.83540	.56769	1.76151	.59101	1.69203	.61480	1.62654	25
36	522	.83413	808	.76032	140	.69091	520	.62548	24
37	560	.83286	846	.75913	179	.68979	561	.62442	23
38	597	.83159	885	.75794	218	.68866	601	.62336	22
39	635	.83033	923	.75675	258	.68754	641	.62230	21
40	.54673	1.82906	.56962	1.75556	.59297	1.68643	.61681	1.62125	20
41	711	.82780	.57000	.75437	336	.68531	721	.62019	19
42	748	.82654	039	.75319	376	.68419	761	.61914	18
43	786	.82528	078	.75200	415	.68308	801	.61808	17
44	824	.82402	116	.75082	454	.68196	842	.61703	16
45	.54862	1.82276	.57155	1.74964	.59494	1.68085	.61882	1.61598	15
46	900	.82150	193	.74846	533	.67974	922	.61493	14
47	938	.82025	232	.74728	573	.67863	962	.61388	13
48	975	.81899	271	.74610	612	.67752	.62003	.61283	12
49	.55013	.81774	309	.74492	651	.67641	043	.61179	11
50	.55051	1.81649	.57348	1.74375	.59691	1.67530	.62083	1.61074	10
51	089	.81524	386	.74257	730	.67419	124	.60970	9
52	127	.81399	425	.74140	770	.67309	164	.60865	8
53	165	.81274	464	.74022	809	.67198	204	.60761	7
54	203	.81150	503	.73905	849	.67088	245	.60657	6
55	.55241	1.81025	.57541	1.73788	.59888	1.66978	.62285	1.60553	5
56	279	.80901	580	.73671	928	.66867	325	.60449	4
57	317	.80777	619	.73555	967	.66757	366	.60345	3
58	355	.80653	657	.73438	.60007	.66647	406	.60241	2
59	393	.80529	696	.73321	046	.66538	446	.60137	1
60	.55431	1.80405	.57735	1.73205	.60086	1.66428	.62487	1.60033	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	61°		60°		59°		58°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	32°		33°		34°		35°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.62487	1.60033	0.64941	1.53986	0.67451	1.48256	0.70021	1.42815	60
1	527	.59930	982	.53888	493	.48163	064	.42726	59
2	568	.59826	.65024	.53791	536	.48070	107	.42638	58
3	608	.59723	065	.53693	578	.47977	151	.42550	57
4	649	.59620	106	.53595	620	.47885	194	.42462	56
5	.62689	1.59517	.65148	1.53497	.67663	1.47792	.70238	1.42374	55
6	730	.59414	189	.53400	705	.47699	281	.42286	54
7	770	.59311	231	.53302	748	.47607	325	.42198	53
8	811	.59208	272	.53205	790	.47514	368	.42110	52
9	852	.59105	314	.53107	832	.47422	412	.42022	51
10	.62892	1.59002	.65355	1.53010	.67875	1.47330	.70455	1.41934	50
11	933	.58900	397	.52913	917	.47238	499	.41847	49
12	973	.58797	438	.52816	960	.47146	542	.41759	48
13	.63014	.58695	480	.52719	.68002	.47053	586	.41672	47
14	055	.58593	521	.52622	045	.46962	629	.41584	46
15	.63095	1.58490	.65563	1.52525	.68088	1.46870	.70673	1.41497	45
16	136	.58388	604	.52429	130	.46778	717	.41409	44
17	177	.58286	646	.52332	173	.46686	760	.41322	43
18	217	.58184	688	.52235	215	.46595	804	.41235	42
19	258	.58083	729	.52139	258	.46503	848	.41148	41
20	.63299	1.57981	.65771	1.52043	.68301	1.46411	.70891	1.41061	40
21	340	.57879	813	.51946	343	.46320	935	.40974	39
22	380	.57778	854	.51850	386	.46229	979	.40887	38
23	421	.57676	896	.51754	429	.46137	.71023	.40800	37
24	462	.57575	938	.51658	471	.46046	066	.40714	36
25	.63503	1.57474	.65980	1.51562	.68514	1.45955	.71110	1.40627	35
26	544	.57372	.66021	.51466	557	.45864	154	.40540	34
27	584	.57271	063	.51370	600	.45773	198	.40454	33
28	625	.57170	105	.51275	642	.45682	242	.40367	32
29	666	.57069	147	.51179	685	.45592	285	.40281	31
30	.63707	1.56969	.66189	1.51084	.68728	1.45501	.71329	1.40195	30
31	748	.56868	230	.50988	771	.45410	373	.40109	29
32	789	.56767	272	.50893	814	.45320	417	.40022	28
33	830	.56667	314	.50797	857	.45229	461	.39936	27
34	871	.56566	356	.50702	900	.45139	505	.39850	26
35	.63912	1.56466	.66398	1.50607	.68942	1.45049	.71549	1.39764	25
36	953	.56366	440	.50512	985	.44958	593	.39679	24
37	994	.56265	482	.50417	.69028	.44868	637	.39593	23
38	.64035	.56165	524	.50322	071	.44778	681	.39507	22
39	076	.56065	566	.50228	114	.44688	725	.39421	21
40	.64117	1.55966	.66608	1.50133	.69157	1.44598	.71769	1.39336	20
41	158	.55866	650	.50038	200	.44508	813	.39250	19
42	199	.55766	692	.49944	243	.44418	857	.39165	18
43	240	.55666	734	.49849	286	.44329	901	.39079	17
44	281	.55567	776	.49755	329	.44239	946	.38994	16
45	.64322	1.55467	.66818	1.49661	.69372	1.44149	.71990	1.38909	15
46	363	.55368	860	.49566	416	.44060	.72034	.38824	14
47	404	.55269	902	.49472	459	.43970	078	.38738	13
48	446	.55170	944	.49378	502	.43881	122	.38653	12
49	487	.55071	986	.49284	545	.43792	167	.38568	11
50	.64528	1.54972	.67028	1.49190	.69588	1.43703	.72211	1.38484	10
51	569	.54873	071	.49097	631	.43614	255	.38399	9
52	610	.54774	113	.49003	675	.43525	299	.38314	8
53	652	.54675	155	.48909	718	.43436	344	.38229	7
54	693	.54576	197	.48816	761	.43347	388	.38145	6
55	.64734	1.54478	.67239	1.48722	.69804	1.43258	.72432	1.38060	5
56	775	.54379	282	.48629	847	.43169	477	.37976	4
57	817	.54281	324	.48536	891	.43080	521	.37891	3
58	858	.54183	366	.48442	934	.42992	565	.37807	2
59	899	.54085	409	.48349	977	.42903	610	.37722	1
60	.64941	1.53986	.67451	1.48256	.70021	1.42815	.72654	1.37638	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	57°		56°		55°		54°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	36°		37°		38°		39°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.72654	1.37638	0.75355	1.32704	0.78129	1.2794	0.80978	1.23490	60
1	699	.37554	401	.32624	175	.27917	.81027	.23416	59
2	743	.37470	447	.32544	222	.27841	075	.23343	58
3	788	.37386	492	.32464	269	.27764	123	.23270	57
4	832	.37302	538	.32384	316	.27688	171	.23196	56
5	.72877	1.37218	.75584	1.32304	.78363	1.27611	.81220	1.23123	55
6	921	.37134	629	.32224	410	.27535	268	.23050	54
7	966	.37050	675	.32144	457	.27458	316	.22977	53
8	.73010	.36967	721	.32064	504	.27382	364	.22904	52
9	055	.36883	767	.31984	551	.27306	413	.22831	51
10	.73100	1.36800	.75812	1.31904	.78598	1.27230	.81461	1.22758	50
11	144	.36716	858	.31825	645	.27153	510	.22685	49
12	189	.36633	904	.31745	692	.27077	558	.22612	48
13	234	.36549	950	.31666	739	.27001	606	.22539	47
14	278	.36466	996	.31586	786	.26925	655	.22467	46
15	.73323	1.36383	.76042	1.31507	.78834	1.26849	.81703	1.22394	45
16	368	.36300	088	.31427	881	.26774	752	.22321	44
17	413	.36217	134	.31348	928	.26698	800	.22249	43
18	457	.36134	180	.31269	975	.26622	849	.22176	42
19	502	.36051	226	.31190	.79022	.26546	898	.22104	41
20	.73547	1.35968	.76272	1.31110	.79070	1.26471	.81946	1.22031	40
21	592	.35885	318	.31031	117	.26395	995	.21959	39
22	637	.35802	364	.30952	164	.26319	.82044	.21886	38
23	681	.35719	410	.30873	212	.26244	092	.21814	37
24	726	.35637	456	.30795	259	.26169	141	.21742	36
25	.73771	1.3554	.76502	1.30716	.79306	1.26093	.82190	1.21670	35
26	816	.35472	548	.30637	354	.26018	238	.21598	34
27	861	.35389	594	.30558	401	.25943	287	.21526	33
28	906	.35307	640	.30480	449	.25867	336	.21454	32
29	951	.35244	686	.30401	496	.25792	385	.21382	31
30	.73996	1.35142	.76733	1.30323	.79544	1.25717	.82434	1.21310	30
31	.74041	.35060	779	.30244	591	.25642	483	.21238	29
32	086	.34978	825	.30166	639	.25567	531	.21166	28
33	131	.34896	871	.30087	686	.25492	580	.21094	27
34	176	.34814	918	.30009	734	.25417	629	.21023	26
35	.74221	1.34732	.76964	1.29931	.79781	1.25343	.82678	1.20951	25
36	267	.34650	.77010	.29853	829	.25268	727	.20879	24
37	312	.34568	057	.29775	877	.25193	776	.20808	23
38	357	.34487	103	.29696	924	.25118	825	.20736	22
39	402	.34405	149	.29618	972	.25044	874	.20665	21
40	.74447	1.34323	.77196	1.29541	.80020	1.24969	.82923	1,20593	20
41	492	.34242	242	.29463	067	.24895	972	.20522	19
42	538	.34160	289	.29385	115	.24820	.83022	.20451	18
43	583	.34079	335	.29307	163	.24746	071	.20379	17
44	628	.33998	382	.29229	211	.24672	120	.20308	16
45	.74674	1.33916	.77428	1.29152	.80258	1.24597	.83169	1.20237	15
46	719	.33835	475	.29074	306	.24523	218	.20166	14
47	764	.33754	521	.28997	354	.24449	268	.20095	13
48	810	.33673	568	.28919	402	.24375	317	.20024	12
49	855	.33592	615	.28842	450	.24301	366	.19953	11
50	.74900	1.33511	.77661	1.28764	.80498	1.24227	.83415	1.19882	10
51	946	.33430	708	.28687	546	.24153	465	.19811	9
52	991	.33349	754	.28610	594	.24079	514	.19740	8
53	.75037	.33268	801	.28533	642	.24005	564	.19669	7
54	082	.33187	848	.28456	690	.23931	613	.19599	6
55	.75128	1,33107	.77895	1.28379	.80738	1.23858	.83662	1.19528	5
56	173	.33026	941	.28302	786	.23784	712	.19457	4
57	219	.32946	988	.28225	834	.23710	761	.19387	3
58	264	.32865	.78035	.28148	882	.23637	811	.19316	2
59	310	.32785	082	.28071	930	.23563	860	.19246	1
60	.75355	1.32704	.78129	1.27994	.80978	1.23490	.83910	1.19175	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	53°		52°		51°		50°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	40°		41°		42°		43°		
	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	
0	0.83910	1.19175	0.86929	1.15037	0.90040	1.11061	0.93252	1.07237	60
1	960	.19105	980	.14969	093	.10996	306	.07174	59
2	.84009	.19035	.87031	.14902	146	.10931	360	.07112	58
3	059	.18964	082	.14834	199	.10867	415	.07049	57
4	108	.18894	133	.14767	251	.10802	469	.06987	56
5	.84158	1.18824	.87184	1.14699	.90304	1.10737	.93524	1.06925	55
6	208	.18754	236	.14632	357	.10672	578	.06862	54
7	258	.18684	287	.14565	410	.10607	633	.06800	53
8	307	.18614	338	.14498	463	.10543	688	.06738	52
9	357	.18544	389	.14430	516	.10478	742	.06676	51
10	.84407	1.18474	.87441	1.14363	.90569	1.10414	.93797	1.06613	50
11	457	.18404	492	.14296	621	.10349	852	.06551	49
12	507	.18334	543	.14229	674	.10285	906	.06489	48
13	556	.18264	595	.14162	727	.10220	961	.06427	47
14	606	.18194	646	.14095	781	.10156	.94016	.06365	46
15	.84656	1.18125	.87698	1.14028	.90834	1.10091	.94071	1.06303	45
16	706	.18055	749	.13961	887	.10027	125	.06241	44
17	756	.17986	801	.13894	940	.09963	180	.06179	43
18	806	.17916	852	.13828	993	.09899	235	.06117	42
19	856	.17846	904	.13761	.91046	.09834	290	.06056	41
20	.84906	1.17777	.87955	1.13694	.91099	1.09770	.94345	1.05994	40
21	956	.17708	.88007	.13627	153	.09706	400	.05932	39
22	.85006	.17638	059	.13561	206	.09642	455	.05870	38
23	057	.17569	110	.13494	259	.09578	510	.05809	37
24	107	.17500	162	.13428	313	.09514	565	.05747	36
25	.85157	1.17430	.88214	1.13361	.91366	1.09450	.94620	1.05685	25
26	207	.17361	265	.13295	419	.09386	676	.05624	34
27	257	.17292	317	.13228	473	.09322	731	.05562	33
28	308	.17223	369	.13162	526	.09258	786	.05501	32
29	358	.17154	421	.13096	580	.09195	841	.05439	31
30	.85408	1.17085	.88473	1.13029	.91633	1.09131	.94896	1.05378	30
31	458	.17016	524	.12963	687	.09067	952	.05317	29
32	509	.16947	576	.12897	740	.09003	.95007	.05255	28
33	559	.16878	628	.12831	794	.08940	062	.05194	27
34	609	.16809	680	.12765	847	.08876	118	.05133	26
35	.85660	1.16741	.88732	1.12699	.91901	1.08813	.95173	1.05072	25
36	710	.16672	784	.12633	955	.08749	229	.05010	24
37	761	.16603	836	.12567	.92008	.08686	284	.04949	23
38	811	.16535	888	.12501	062	.08622	340	.04888	22
39	862	.16466	940	.12435	116	.08559	395	.04827	21
40	.85912	1.16398	.88992	1.12369	.92170	1.08496	.95451	1.04766	20
41	963	.16329	.89045	.12303	224	.08432	506	.04705	19
42	.86014	.16261	097	.12238	277	.08369	562	.04644	18
43	064	.16192	149	.12172	331	.08306	618	.04583	17
44	115	.16124	201	.12106	385	.08243	673	.04522	16
45	.86166	1.16056	.89253	1.12041	.92439	1.08179	.95729	1.04461	15
46	216	.15987	306	.11975	493	.08116	785	.04401	14
47	267	.15919	358	.11909	547	.08053	841	.04340	13
48	318	.15851	410	.11844	601	.07990	897	.04279	12
49	368	.15783	463	.11778	655	.07927	952	.04218	11
50	.86419	1.15715	.89515	1.11713	.92709	1.07864	.96008	1.04158	10
51	470	.15647	567	.11648	763	.07801	064	.04097	9
52	521	.15579	620	.11582	817	.07738	120	.04036	8
53	572	.15511	672	.11517	872	.07676	176	.03976	7
54	623	.15443	725	.11452	926	.07613	232	.03915	6
55	.86674	1.15375	.89777	1.11387	.92980	1.07550	.96288	1.03855	5
56	725	.15308	830	.11321	.93034	.07487	344	.03794	4
57	776	.15240	883	.11256	088	.07425	400	.03734	3
58	827	.15172	935	.11191	143	.07362	457	.03674	2
59	878	.15104	988	.11126	197	.07299	513	.03613	1
60	.86929	1.15037	.90040	1.11061	.93252	1.07237	.96569	1.03553	0
	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	Cot.	Tan.	M.
	49°		48°		47°		46°		

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TABLE IV.—*Natural tangents and cotangents*—Continued

M.	44° Tan.	44° Cot.		M.	44° Tan.	44° Cot.		M.	44° Tan.	44° Cot.	
0	0.96569	1.03553	60	20	0.97700	1.02355	40	40	0.98843	1.01170	20
1	625	.03493	59	21	756	.02295	39	41	901	.01112	19
2	681	.03433	58	22	813	.02236	38	42	958	.01053	18
3	738	.03372	57	23	870	.02176	37	43	.99016	.00994	17
4	794	.03312	56	24	927	.02117	36	44	073	.00935	16
5	.96850	1.03252	55	25	.97984	1.02057	35	45	.99131	1.00876	15
6	907	.03192	54	26	.98041	.01998	34	46	189	.00818	14
7	963	.03132	53	27	098	.01939	33	47	247	.00759	13
8	.97020	.03072	52	28	155	.01879	32	48	304	.00701	12
9	076	.03012	51	29	213	.01820	31	49	362	.00642	11
10	.97133	1.02952	50	30	.98270	1.01761	30	50	.99420	1.00583	10
11	189	.02892	49	31	327	.01702	29	51	478	.00525	9
12	246	.02832	48	32	384	.01642	28	52	536	.00467	8
13	302	.02772	47	33	441	.01583	27	53	594	.00408	7
14	359	.02713	46	34	499	.01524	26	54	652	.00350	6
15	.97416	1.02653	45	35	.98556	1.01465	25	55	.99710	1.00291	5
16	472	.02593	44	36	613	.01406	24	56	768	.00233	4
17	529	.02533	43	37	671	.01347	23	57	826	.00175	3
18	586	.02474	42	38	728	.01288	22	58	884	.00116	2
19	643	.02414	41	39	786	.01229	21	59	942	.00058	1
20	.97700	1.02355	40	40	.98843	1.01170	20	60	1.00000	1.00000	0
	Cot.	Tan.	M.		Cot.	Tan.	M.		Cot.	Tan.	M.
	45°				45°				45°		

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TABLE V

NATURAL COTANGENTS OF SMALL ANGLES

(For every 10 seconds from 0° to 2°)

′	″	0° 0′ Cot.	Diff.	Prop. pts.	′	″	0° 10′ Cot.	Diff.	Prop. pts.
0	0	*Infinite*	*Infinite*		10	0	343. 773 71		
	10	20 626. 481	10 313. 241			10	338. 138 04	5. 635 67	
	20	10 313. 240	3 437. 7465			20	332. 684 17	5. 453 87	
	30	6 875. 4935	1 718. 8734			30	327. 403 44	5. 280 73	
	40	5 156. 6201	1 031. 3241			40	322. 287 73	5. 115 71	
	50	4 125. 2960	687. 5493			50	317. 329 42	4. 958 31	
1	0	3 437. 7467			11	0	312. 521 37	4. 808 05	
	10	2 946. 6400	491. 1067			10	307. 856 84	4. 664 53	
	20	2 578. 3099	368. 3301			20	303. 329 50	4. 527 34	
	30	2 291. 8310	286. 4789			30	298. 933 39	4. 396 11	
	40	2 062. 6479	229. 1831			40	294. 662 88	4. 270 51	
	50	1 875. 1344	187. 5135			50	290. 512 66	4. 150 22	
2	0	1 718. 8732	156. 2612		12	0	286. 477 73	4. 034 93	
	10	1 586. 6521	132. 2211			10	282. 553 35	3. 924 38	
	20	1 473. 3198	113. 3323			20	278. 735 03	3. 818 32	
	30	1 375. 0985	98. 2213			30	275. 018 53	3. 716 50	
	40	1 289. 1548	85. 9437			40	271. 399 83	3. 618 70	
	50	1 213. 3221	75. 8327			50	267. 875 13	3. 524 70	
3	0	1 145. 9153	67. 4068		13	0	264. 440 80	3. 434 33	
	10	1 085. 6039	60. 3114			10	261. 093 42	3. 347 38	
	20	1 031. 3237	54. 2802			20	257. 829 71	3. 263 71	
	30	982. 2 1302	49. 1 1068			30	254. 646 60	3. 183 11	
	40	937. 5 6695	44. 6 4607			40	251. 541 12	3. 105 48	
	50	896. 8 0313	40. 7 6382			50	248. 510 47	3. 030 65	
4	0	859. 4 3630	37. 3 6683		14	0	245. 551 98	2. 958 49	
	10	825. 0 5882	34. 3 7748			10	242. 663 10	2. 888 88	
	20	793. 3 2576	31. 7 3306			20	239. 841 41	2. 821 69	
	30	763. 9 4329	29. 3 8247			30	237. 084 58	2. 756 83	
	40	736. 6 5957	27. 2 8372			40	234. 390 40	2. 694 18	
	50	711. 2 5748	25. 4 0209			50	231. 756 77	2. 633 63	
5	0	687. 5 4887	23. 7 0861		15	0	229. 181 66	2. 575 11	
	10	665. 3 6984	22. 1 7903			10	226. 663 15	2. 518 51	
	20	644. 5 7700	20. 7 9284			20	224. 199 39	2. 463 76	
	30	625. 0 4433	19. 5 3267			30	221. 788 61	2. 410 78	
	40	606. 6 6065	18. 3 8368			40	219. 429 13	2. 359 48	
	50	589. 3 2745	17. 3 3320			50	217. 119 31	2. 309 82	
6	0	572. 9 5721	16. 3 7024		16	0	214. 857 62	2. 261 69	
	10	557. 4 7185	15. 4 8536			10	212. 642 56	2. 215 06	
	20	542. 8 0151	14. 6 7034			20	210. 472 71	2. 169 85	
	30	528. 8 8349	13. 9 1802			30	208. 346 69	2. 126 02	
	40	515. 6 6137	13. 2 2212			40	206. 263 19	2. 082 50	
	50	503. 0 8423	12. 5 7714	**Cotangent**		50	204. 220 95	2. 042 24	**Cotangent**
7	0	491. 1 0600	11. 9 7823	*Differences*	17	0	202. 218 75	2. 002 20	*Differences*
	10	479. 6 8490	11. 4 2110	*are too large*		10	200. 255 43	1. 963 32	*are too large*
	20	468. 7 8294	10. 9 0196	*to tabulate*		20	198. 329 86	1. 925 57	*to tabulate*
	30	458. 3 6551	10. 4 1743			30	196. 440 98	1. 888 88	
	40	448. 4 0101	9. 9 6450			40	194. 587 73	1. 853 25	
	50	438. 8 6053	9. 5 4048			50	192. 769 12	1. 818 61	
8	0	429. 7 1757	9. 1 4296		18	0	190. 984 19	1. 784 93	
	10	420. 9 4779	8. 7 6978			10	189. 232 01	1. 752 18	
	20	412. 5 2880	8. 4 1899			20	187. 511 68	1. 720 33	
	30	404. 4 3997	8. 0 8883			30	185. 822 36	1. 689 32	
	40	396. 6 6225	7. 7 7772			40	184. 163 20	1. 659 16	
	50	389. 1 7802	7. 4 8423			50	182. 533 40	1. 629 80	
9	0	381. 9 7099	7. 2 0703		19	0	180. 932 20	1. 601 20	
	10	375. 0 2603	6. 9 4496			10	179. 358 84	1. 573 36	
	20	368. 3 2911	6. 6 9692			20	177. 812 61	1. 546 23	
	30	361. 8 6716	6. 4 6195			30	176. 292 82	1. 519 79	
	40	355. 6 2804	6. 2 3912			40	174. 798 78	1. 494 04	
	50	349. 6 0041	6. 0 2763			50	173. 329 85	1. 468 93	
10	0	343. 7 7371	5. 8 2670		20	0	171. 885 40	1. 444 45	

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TABLE V.—*Natural cotangents of small angles*—Continued

′	″	0°20′ Cot.	Diff.	Prop. pts.	′	″	0°30′ Cot.	Diff.	Prop. pts.
20	0	171.885 40	1.420 57		30	0	114.588 65	633 12	
	10	170.464 83	1.397 29			10	113.955 53	626 16	
	20	169.067 54	1.374 56			20	113.329 37	619 32	
	30	167.692 98	1.352 40			30	112.710 05	612 59	
	40	166.340 58	1.330 76			40	112.097 46	605 96	
	50	165.009 82	1.309 63			50	111.491 50	599 45	
21	0	163.700 19	1.289 01		31	0	110.892 05	593 04	Cotangent
	10	162.411 18	1.268 87			10	110.299 01	586 73	65 000 60 000
	20	161.142 31	1.249 20			20	109.712 28	580 52	1 6 500.0 6 000.0
	30	159.893 11	1.229 98			30	109.131 76	574 41	2 13 000.0 12 000.0
	40	158.663 13	1.211 20			40	108.557 35	568 39	3 19 500.0 18 000.0
	50	157.451 93	1.192 85			50	107.988 96	562 48	4 26 000.0 24 000.0
22	0	156.259 08	1.174 91		32	0	107.426 48	556 64	
	10	155.084 17	1.157 38			10	106.869 84	550 91	5 32 500.0 30 000.0
	20	153.926 79	1.140 23			20	106.318 93	545 26	6 39 000.0 36 000.0
	30	152.786 56	1.123 46			30	105.773 67	539 69	7 45 500.0 42 000.0
	40	151.663 10	1.107 06			40	105.233 98	534 22	8 52 000.0 48 000.0
	50	150.556 04	1.091 02			50	104.699 76	528 82	9 58 500.0 54 000.0
23	0	149.465 02	1.075 32		33	0	104.170 94	523 50	55 000 50 000
	10	148.389 70	1.059 96			10	103.647 44	518 27	1 5 500.0 5 000.0
	20	147.329 74	1.044 92			20	103.129 17	513 11	2 11 000.0 10 000.0
	30	146.284 82	1.030 21			30	102.616 06	508 03	3 16 500.0 15 000.0
	40	145.254 61	1.015 80			40	102.108 03	503 03	4 22 000.0 20 000.0
	50	144.238 81	1.001 69			50	101.605 00	498 10	
24	0	143.237 12	0.987 87		34	0	101.106 90	493 23	5 27 500.0 25 000.0
	10	142.249 25	0.974 34			10	100.613 67	488 45	6 33 000.0 30 000.0
	20	141.274 91	0.961 09			20	100.125 22	483 731	7 38 500.0 35 000.0
	30	140.313 82	0.948 10			30	99.641 489	479 078	8 44 000.0 40 000.0
	40	139.365 72	0.935 37			40	99.162 411	474 494	9 49 500.0 45 000.0
	50	138.430 35	0.922 90			50	98.687 917	469 974	500 000
25	0	137.507 45	0.910 68		35	0	98.217 943	465 521	1 50 000.0
	10	136.596 77	0.898 70			10	97.752 422	461 128	2 100 000.0
	20	135.698 07	0.886 94			20	97.291 294	456 799	3 150 000.0
	30	134.811 13	0.875 43			30	96.834 495	452 530	4 200 000.0
	40	133.935 70	0.864 14			40	96.381 965	448 320	
	50	133.071 56	0.853 05			50	95.933 645	444 170	5 250 000.0
26	0	132.218 51	0.842 19		36	0	95.489 475	440 076	6 300 000.0
	10	131.376 32	0.831 53	Cotangent		10	95.049 399	436 038	7 350 000.0
	20	130.544 79	0.821 07	*Differences are too large to tabulate.*		20	94.613 361	432 057	8 400 000.0
	30	129.723 72	0.810 80			30	94.181 304	428 129	9 450 000.0
	40	128.912 92	0.800 74			40	93.753 175	424 255	400 000
	50	128.112 18	0.790 84			50	93.328 920	420 433	1 40 000.0
27	0	127.321 34	0.781 15		37	0	92.908 487	416 662	2 80 000.0
	10	126.540 19	0.771 62			10	92.491 825	412 942	3 120 000.0
	20	125.768 57	0.762 26			20	92.078 883	409 272	4 160 000.0
	30	125.006 31	0.753 09			30	91.669 611	405 650	5 200 000.0
	40	124.253 22	0.744 06			40	91.263 961	402 076	6 240 000.0
	50	123.509 16	0.735 20			50	90.861 885	398 549	7 280 000.0
28	0	122.773 96	0.726 51		38	0	90.463 336	395 069	8 320 000.0
	10	122.047 45	0.717 96			10	90.068 267	391 633	9 360 000.0
	20	121.329 49	0.709 56			20	89.676 634	388 243	300 000
	30	120.619 93	0.701 31			30	89.288 391	384 896	1 30 000.0
	40	119.918 62	0.693 20			40	88.903 495	381 593	2 60 000.0
	50	119.225 42	0.685 24			50	88.521 902	378 330	3 90 000.0
29	0	118.540 18	0.677 40		39	0	88.143 572	375 112	4 120 000.0
	10	117.862 78	0.669 71			10	87.768 460	371 932	
	20	117.193 07	0.662 14			20	87.396 528	368 794	5 150 000.0
	30	116.530 93	0.654 70			30	87.027 734	365 695	6 180 000.0
	40	115.876 23	0.647 39			40	86.662 039	362 635	7 210 000.0
	50	115.228 84	0.640 19			50	86.299 404	359 613	8 240 000.0
30	0	114.588 65			40	0	85.939 791		9 270 000.0

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TABLE V.—*Natural cotangents of small angles*—Continued

0° 40′

′	″	Cot.	Diff.
40	0	85. 939 791	356 629
	10	.583 162	353 682
	20	.229 480	350 771
	30	84. 878 709	347 896
	40	.530 813	345 056
	50	.185 757	342 250
41	0	83. 843 507	339 480
	10	.504 027	336 742
	20	.167 285	334 037
	30	82. 833 248	331 366
	40	.501 882	328 725
	50	.173 157	326 116
42	0	81. 847 041	323 538
	10	.523 503	320 991
	20	.202 512	318 474
	30	80. 884 038	315 985
	40	.568 053	313 527
	50	.254 526	311 096
43	0	79. 943 430	308 694
	10	.634 736	306 320
	20	.328 416	303 973
	30	.024 443	301 652
	40	78. 722 791	299 358
	50	.423 433	297 091
44	0	78. 126 342	294 849
	10	.831 493	292 631
	20	.538 862	290 440
	30	.248 422	288 273
	40	76. 960 149	286 130
	50	.674 019	284 010
45	0	76. 390 009	281 914
	10	.108 095	279 841
	20	75. 828 254	277 792
	30	.550 462	275 764
	40	.274 698	273 758
	50	.000 940	271 775
46	0	74. 729 165	269 813
	10	.459 352	267 871
	20	.191 481	265 952
	30	73. 925 529	264 052
	40	.661 477	262 173
	50	.399 304	260 313
47	0	73. 138 991	258 474
	10	72. 880 517	256 654
	20	.623 863	254 853
	30	.369 010	253 070
	40	.115 940	251 308
	50	71. 864 632	249 562
48	0	71. 615 070	247 835
	10	.367 235	246 126
	20	.121 109	244 435
	30	70. 876 674	242 761
	40	.633 913	241 103
	50	.392 810	239 464
49	0	70. 153 346	237 840
	10	69. 915 506	236 233
	20	.679 273	234 643
	30	.444 630	233 068
	40	.211 562	231 509
	50	68. 980 053	229 966
50	0	68. 750 087	

Cotangent

	360 000	340 000
1	36 000.0	34 000.0
2	72 000.0	68 000.0
3	108 000.0	102 000.0
4	144 000.0	136 000.0
5	180 000.0	170 000.0
6	216 000.0	204 000.0
7	252 000.0	238 000.0
8	288 000.0	272 000.0
9	384 000.0	306 000.0

	320 000	300 000
1	32 000.0	30 000.0
2	64 000.0	60 000.0
3	96 000.0	90 000.0
4	128 000.0	120 000.0
5	160 000.0	150 000.0
6	192 000.0	180 000.0
7	224 000.0	210 000.0
8	256 000.0	240 000.0
9	288 000.0	270 000.0

	280 000	260 000
1	28 000.0	26 000.0
2	56 000.0	52 000.0
3	84 000.0	78 000.0
4	112 000.0	104 000.0
5	140 000.0	130 000.0
6	168 000.0	156 000.0
7	196 000.0	182 000.0
8	224 000.0	208 000.0
9	252 000.0	234 000.0

	240 000	220 000
1	24 000.0	22 000.0
2	48 000.0	44 000.0
3	72 000.0	66 000.0
4	96 000.0	88 000.0
5	120 000.0	110 000.0
6	144 000.0	132 000.0
7	168 000.0	154 000.0
8	192 000.0	176 000.0
9	216 000.0	198 000.0

0° 50′

′	″	Cot.	Diff.
50	0	68. 750 087	228 438
	10	.521 649	226 925
	20	.294 724	225 427
	30	.069 297	223 945
	40	67. 845 352	222 476
	50	.622 876	221 022
51	0	67. 401 854	219 582
	10	.182 272	218 157
	20	66. 964 115	216 744
	30	.747 371	215 347
	40	.532 024	213 961
	50	.318 063	212 590
52	0	66. 105 473	211 232
	10	65. 894 241	209 887
	20	.684 354	208 554
	30	.475 800	207 234
	40	.268 566	205 927
	50	.062 639	204 631
53	0	64. 858 008	203 349
	10	.654 659	202 078
	20	.452 581	200 820
	30	.251 761	199 572
	40	.052 189	198 336
	50	63. 853 853	197 112
54	0	63. 656 741	195 899
	10	.460 842	194 697
	20	.266 145	193 507
	30	.072 638	192 327
	40	62. 880 311	191 158
	50	.689 153	189 999
55	0	62. 499 154	188 852
	10	.310 302	187 714
	20	.122 588	186 586
	30	61. 936 002	185 470
	40	.750 532	184 362
	50	.566 170	183 265
56	0	61. 382 905	182 177
	10	.200 728	181 100
	20	.019 628	180 031
	30	60. 839 597	178 972
	40	.660 625	177 923
	50	.482 702	176 882
57	0	60. 305 820	175 851
	10	.129 969	174 829
	20	59. 955 140	173 815
	30	.781 325	172 811
	40	.608 514	171 815
	50	.436 699	170 827
58	0	59. 265 872	169 848
	10	.096 024	168 878
	20	58. 927 146	167 916
	30	.759 230	166 962
	40	.592 268	166 016
	50	.426 252	165 078
59	0	58. 261 174	164 149
	10	.097 025	163 226
	20	57. 933 799	162 312
	30	.771 487	161 405
	40	.610 082	160 506
	50	.449 576	159 614
60	0	57. 289 962	

Cotangent

	230 000	220 000
1	23 000.0	22 000.0
2	46 000.0	44 000.0
3	69 000.0	66 000.0
4	92 000.0	88 000.0
5	115 000.0	110 000.0
6	138 000.0	132 000.0
7	161 000.0	154 000.0
8	184 000.0	176 000.0
9	207 000.0	198 000.0

	210 000	200 000
1	21 000.0	20 000.0
2	42 000.0	40 000.0
3	63 000.0	60 000.0
4	84 000.0	80 000.0
5	105 000.0	100 000.0
6	126 000.0	120 000.0
7	147 000.0	140 000.0
8	168 000.0	160 000.0
9	189 000.0	180 000.0

	190 000	180 000
1	19 000.0	18 000.0
2	38 000.0	36 000.0
3	57 000.0	54 000.0
4	76 000.0	72 000.0
5	95 000.0	90 000.0
6	114 000.0	108 000.0
7	133 000.0	126 000.0
8	152 000.0	144 000.0
9	171 000.0	162 000.0

	170 000	160 000
1	17 000.0	16 000.0
2	34 000.0	32 000.0
3	51 000.0	48 000.0
4	68 000.0	64 000.0
5	85 000.0	80 000.0
6	102 000.0	96 000.0
7	119 000.0	112 000.0
8	136 000.0	128 000.0
9	153 000.0	144 000.0

	150 000
1	15 000.0
2	30 000.0
3	45 000.0
4	60 000.0
5	75 000.0
6	90 000.0
7	105 000.0
8	120 000.0
9	135 000.0

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TABLE V.—*Natural cotangents of small angles*—Continued

′	″	1° 0′ Cot.	Diff.	Prop. pts.	′	″	1° 10′ Cot.	Diff.	Prop. pts.
0	0	57. 289 962			10	0	49. 103 881		
	10	. 131 231	158 731			10	48. 987 212	116 669	
	20	56. 973 378	157 853			20	. 871 096	116 116	
	30	. 816 394	156 984			30	. 755 529	115 567	
	40	. 660 273	156 121			40	. 640 508	115 021	
	50	. 505 007	155 266			50	. 526 027	114 481	
			154 417					113 943	
1	0	56. 350 590			11	0	48. 412 084		
	10	. 197 013	153 577			10	. 298. 675	113 409	
	20	. 044 272	152 741			20	. 185 795	112 880	
	30	55. 892 358	151 914			30	. 073 441	112 354	
	40	. 741 265	151 093			40	47. 961 610	111 831	
	50	. 590 987	150 278			50	. 850 298	111 312	
			149 470					110 797	
2	0	55. 441 517			12	0	47. 739 501		
	10	. 292 848	148 669			10	. 629 216	110 285	
	20	. 144 974	147 874			20	. 519 439	109 777	
	30	54. 997 888	147 086			30	. 410 167	109 272	
	40	. 851 585	146 303			40	. 301 396	108 771	
	50	. 706 058	145 527			50	. 193 122	108 274	
			144 758					107 779	
3	0	54. 561 300			13	0	47. 085 343		
	10	. 417 307	143 993			10	46. 978 055	107 288	
	20	. 274 071	143 236			20	. 871 254	106 801	
	30	. 131 587	142 484			30	. 764 938	106 316	
	40	53. 989 849	141 738			40	. 659 103	105 835	
	50	. 848 851	140 998			50	. 553 745	105 358	
			140 263					104 883	
4	0	53. 708 588			14	0	46. 448 862		
	10	. 569 052	139 536			10	. 344 450	104 412	
	20	. 430 240	138 812			20	. 240 507	103 943	
	30	. 292 145	138 095			30	. 137 028	103 479	
	40	. 154 762	137 383			40	. 034 011	103 017	
	50	. 018 085	136 677			50	45. 931 453	102 558	
			135 976					102 102	
5	0	52. 882 109			15	0	45. 829 351		
	10	. 746 828	135 281			10	. 727 702	101 649	
	20	. 612 238	134 590			20	. 626 502	101 200	
	30	. 478 332	133 906			30	. 525 749	100 753	
	40	. 345 106	133 226			40	. 425 440	100 309	
	50	. 212 555	132 551			50	. 325 571	99 869	
			131 882					99 430	
6	0	52. 080 673			16	0	45. 226 141		
	10	51. 949 455	131 218			10	. 127 145	98 996	
	20	. 818 896	130 559			20	. 028 582	98 563	
	30	. 688 992	129 904			30	44. 930 448	98 134	
	40	. 559 737	129 255			40	. 832 741	97 707	
	50	. 431 127	128 610			50	. 735 458	97 283	
			127 970					96 862	
7	0	51. 303 157			17	0	44. 638 596		
	10	. 175 821	127 336			10	. 542 152	96 444	
	20	. 049 116	126 705			20	. 446 123	96 029	
	30	50. 923 037	126 079			30	. 350 508	95 615	
	40	. 797 578	125 459			40	. 255 303	95 205	
	50	. 672 736	124 842			50	. 160 506	94 797	
			124 230					94 393	
8	0	50. 548 506			18	0	44. 066 113		
	10	. 424 883	123 623			10	43. 972. 123	93 990	
	20	. 301 863	123 020			20	. 878 533	93 590	
	30	. 179 442	122 421			30	. 785 341	93 192	
	40	. 057 615	121 827			40	. 692 543	92 798	
	50	49. 936 378	121 237			50	. 600 137	92 406	
			120 652					92 015	
9	9	49. 815 726			19	0	43. 508 122		
	10	. 695 656	120 070			10	. 416 493	91 629	
	20	. 576 163	119 493			20	. 325 250	91 243	
	30	. 457 243	118 920			30	. 234 389	90 861	
	40	. 338 892	118 351			40	. 143 908	90 481	
	50	. 221 106	117 786			50	. 053 805	90 103	
			117 225					89 728	
10	0	49. 103 881			20	0	42. 964 077		

Cotangent

	160 000	150 000
1	16 000. 0	15 000. 0
2	32 000. 0	30 000. 0
3	48 000. 0	45 000. 0
4	64 000. 0	60 000. 0
5	80 000. 0	75 000. 0
6	96 000. 0	90 000. 0
7	112 000. 0	105 000. 0
8	128 000. 0	120 000. 0
9	144 000. 0	135 000. 0

	140 000	130 000
1	14 000. 0	13 000. 0
2	28 000. 0	26 000. 0
3	42 000. 0	39 000. 0
4	56 000. 0	52 000. 0
5	70 000. 0	65 000. 0
6	84 000. 0	78 000. 0
7	98 000. 0	91 000. 0
8	112 000. 0	104 000. 0
9	126 000. 0	117 000. 0

	120 000
1	12 000. 0
2	24 000. 0
3	36 000. 0
4	48 000. 0
5	60 000. 0
6	72 000. 0
7	84 000. 0
8	96 000. 0
9	108 000. 0

	110 000
1	11 000. 0
2	22 000. 0
3	33 000. 0
4	44 000. 0
5	55 000. 0
6	66 000. 0
7	77 000. 0
8	88 000. 0
9	99 000. 0

Cotangent

	120 000	110 000
1	12 000. 0	11 000. 0
2	24 000. 0	22 000. 0
3	36 000. 0	33 000. 0
4	48 000. 0	44 000. 0
5	60 000. 0	55 000. 0
6	72 000. 0	66 000. 0
7	84 000. 0	77 000. 0
8	96 000. 0	88 000. 0
9	108 000. 0	99 000. 0

	100 000	90 000
1	10 000. 0	9 000. 0
2	20 000. 0	18 000. 0
3	30 000. 0	27 000. 0
4	40 000. 0	36 000. 0
5	50 000. 0	45 000. 0
6	60 000. 0	54 000. 0
7	70 000. 0	63 000. 0
8	80 000. 0	72 000. 0
9	90 000. 0	81 000. 0

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TABLE V.—*Natural cotangents of small angles*—Continued

′	″	Cot.	Diff.	Prop. pts.
		1° 20′		
20	0	42. 964 077	89 354	
	10	.874 723	88 984	
	20	.785 739	88 616	
	30	.697 123	88 249	
	40	.608 874	87 886	
	50	.520 988	87 524	
21	0	42. 433 464	87 165	
	10	.346 299	86 807	
	20	.259 492	86 453	
	30	.173 039	86 100	
	40	.086 939	85 749	
	50	.001 190	85 400	
22	0	41. 915 790	85 054	Cotangent
	10	.830 736	84 710	89 000 87 000
	20	.746 026	84 368	1 8 900.0 8 700.0
	30	.661 658	84 027	2 17 800.0 17 400.0
	40	.577 631	83 690	3 26 700.0 26 100.0
	50	.493 941	83 353	4 35 600.0 34 800.0
23	0	41. 410 588	83 020	5 44 500.0 43 500.0
	10	.327 568	82 687	6 53 400.0 52 200.0
	20	.244 881	82 358	7 62 300.0 60 900.0
	30	.162 523	82 029	8 71 200.0 69 600.0
	40	.080 494	81 703	9 80 100.0 78 300.0
	50	40. 998 791	81 379	85 000 83 000
24	0	40. 917 412	81 057	1 8 500.0 8 300.0
	10	.836 355	80 737	2 17 000.0 16 600.0
	20	.755 618	80 418	3 25 500.0 24 900.0
	30	.675 200	80 102	4 34 000.0 33 200.0
	40	.595 098	79 786	5 42 500.0 41 500.0
	50	.515 312	79 475	6 51 000.0 49 800.0
25	0	40. 435 837	79 163	7 59 500.0 58 100.0
	10	.356 674	78 854	8 68 000.0 66 400.0
	20	.277 820	78 546	9 76 500.0 74 700.0
	30	.199 274	78 241	81 000 79 000
	40	.121 033	77 937	1 8 100.0 7 900.0
	50	.043 096	77 635	2 16 200.0 15 800.0
26	0	39. 965 461	77 335	3 24 300.0 23 700.0
	10	.888 126	77 037	4 32 400.0 31 600.0
	20	.811 089	76 739	5 40 500.0 39 500.0
	30	.734 350	76 445	6 48 600.0 47 400.0
	40	.657 905	76 151	7 56 700.0 55 300.0
	50	.581 754	75 859	8 64 800.0 63 200.0
27	0	39. 505 895	75 570	9 72 900.0 71 100.0
	10	.430 325	75 281	77 000 75 000
	20	.355 044	74 994	1 7 700.0 7 500.0
	30	.280 050	74 709	2 15 400.0 15 000.0
	40	.205 341	74 426	3 23 100.0 22 500.0
	50	.130 915	74 144	4 30 800.0 30 000.0
28	0	39. 056 771	73 863	5 38 500.0 37 500.0
	10	38. 982 908	73 585	6 46 200.0 45 000.0
	20	.909 323	73 308	7 53 900.0 52 500.0
	30	.836 015	73 033	8 61 600.0 60 000.0
	40	.762 982	72 758	9 69 300.0 67 500.0
	50	.690 224	72 486	73 000 71 000
29	0	38 617 738	72 215	1 7 300.0 7 100.0
	10	.545 523	71 945	2 14 600.0 14 200.0
	20	.473 578	71 678	3 21 900.0 21 300.0
	30	.401 900	71 411	4 29 200.0 28 400.0
	40	.330 489	71 147	5 36 500.0 35 500.0
	50	.259 342	70 883	6 43 800.0 42 600.0
				7 51 100.0 49 700.0
				8 58 400.0 56 800.0
30	0	38. 188 459		9 65 700.0 63 900.0

′	″	Cot.	Diff.	Prop. pts.
		1° 30′		
30	0	38. 188 459	70 621	
	10	.117 838	70 360	
	20	.047 478	70 101	
	30	37. 977 377	69 844	
	40	.907 533	69 587	
	50	.837 946	69 333	
31	0	37 768 613	69 079	
	10	.699 534	68 827	
	20	.630 707	68 577	
	30	.562 130	68 327	
	40	.493 803	68 079	
	50	.425 724	67 832	
32	0	37 357 892	67 588	
	10	.290 304	67 343	
	20	.222 961	67 101	
	30	.155 860	66 859	
	40	.089 001	66 619	
	50	.022 382	66 381	
33	0	36 956 001	66 143	
	10	.889 858	65 907	Cotangent
	20	.823 951	65 672	71 000 69 000
	30	.758 279	65 439	
	40	.692 840	65 206	1 7 100.0 6 900.0
	50	.627 634	64 975	2 14 200.0 13 800.0
34	0	36 562 659	64 745	3 21 300.0 20 700.0
	10	.497 914	64 516	4 28 400.0 27 600.0
	20	.433 398	64 289	5 35 500.0 34 500.0
	30	.369 109	64 062	6 42 600.0 41 400.0
	40	.305 047	63 837	7 49 700.0 48 300.0
	50	.241 210	63 614	8 56 800.0 55 200.0
35	0	36 177 596	63 390	9 63 900.0 62 100.0
	10	.114 206	63 169	67 000 65 000
	20	.051 037	62 949	1 6 700.0 6 500.0
	30	35. 988 088	62 729	2 13 400.0 13 000.0
	40	.925 359	62 512	3 20 100.0 19 500.0
	50	.862 847	62 294	4 26 800.0 26 000.0
36	0	35. 800 553	62 078	5 33 500.0 32 500.0
	10	.738 475	61 864	6 40 200.0 39 000.0
	20	.676 611	61 650	7 46 900.0 45 500.0
	30	.614 961	61 437	8 53 600.0 52 000.0
	40	.553 524	61 226	9 60 300.0 58 500.0
	50	.492 298	61 016	63 000 61 000
37	0	35. 431 282	60 806	1 6 300.0 6 100.0
	10	.370 476	60 598	2 12 600.0 12 200.0
	20	.309 878	60 391	3 18 900.0 18 300.0
	30	.249 487	60 185	4 25 200.0 24 400.0
	40	.189 302	59 980	5 31 500.0 30 500.0
	50	.129 322	59 776	6 37 800.0 36 600.0
38	0	35. 069 546	59 573	7 44 100.0 42 700.0
	10	.009 973	59 372	8 50 400.0 48 800.0
	20	34. 950 601	59 170	9 56 700.0 54 900.0
	30	.891 431	58 970	59 000 57 000
	40	.832 461	58 772	1 5 900.0 5 700.0
	50	.773 689	58 574	2 11 800.0 11 400.0
39	0	34. 715 115	58 377	3 17 700.0 17 100.0
	10	.656 738	58 181	4 23 600.0 22 800.0
	20	.598 557	57 987	5 29 500.0 28 500.0
	30	.540 570	57 792	6 35 400.0 34 200.0
	40	.482 778	57 600	7 41 300.0 39 900.0
	50	.425 178	57 407	8 47 200.0 45 600.0
40	0	34. 367 771		9 53 100.0 51 300.0

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TABLE V.—*Natural cotangents of small angles*—Continued

1° 40′

′	″	Cot.	Diff.
40	0	34. 367 771	57 217
	10	.310 554	57 026
	20	.253 528	56 838
	30	.196 690	56 649
	40	.140 041	56 462
	50	.083 579	56 276
41	0	34. 027 303	56 091
	10	33. 971 212	55 906
	20	.915 306	55 722
	30	.859 584	55 540
	40	.804 044	55 358
	50	.748 686	55 177
42	0	33. 693 509	54 997
	10	.638 512	54 818
	20	.583 694	54 640
	30	.529 054	54 463
	40	.474 591	54 286
	50	.420 305	54 111
43	0	33. 366 194	53 935
	10	.312 259	53 762
	20	.258 497	53 589
	30	.204 908	53 416
	40	.151 492	53 245
	50	.098 247	53 074
44	0	33. 045 173	52 905
	10	32. 992 268	52 736
	20	.939 532	52 567
	30	.886 965	52 400
	40	.834 565	52 234
	50	.782 331	52 067
45	0	32. 730 264	51 903
	10	.678 361	51 739
	20	.626 622	51 575
	30	.575 047	51 412
	40	.523 635	51 251
	50	.472 384	51 089
46	0	32. 421 295	50 930
	10	.370 365	50. 769
	20	.319 596	50 611
	30	.268 985	50 452
	40	.218 533	50. 296
	50	.168 237	50 138
47	0	32. 118 099	49 983
	10	.068 116	49 827
	20	.018 289	49 673
	30	31. 968 616	49 520
	40	.919 096	49 366
	50	.869 730	49 214
48	0	31. 820 516	49 062
	10	.771 454	48 912
	20	.722 542	48 761
	30	.673 781	48 612
	40	.625 169	48 463
	50	.576 706	48 314
49	0	31. 528 392	48 168
	10	.480 224	48 020
	20	.432 204	47 874
	30	.384 330	47 729
	40	.336 601	47 584
	50	.289 017	47 440
50	0	31. 241 577	

Cotangent

	57 000	55 000
1	5 700.0	5 500.0
2	11 400.0	11 000.0
3	17 100.0	16 500.0
4	22 800.0	22 000.0
5	28 500.0	27 500.0
6	34 200.0	33 000.0
7	39 900.0	38 500.0
8	45 600.0	44 000.0
9	51 300.0	49 500.0

	53 000	51 000
1	5 300.0	5 100.0
2	10 600.0	10 200.0
3	15 900.0	15 300.0
4	21 200.0	20 400.0
5	26 500.0	25 500.0
6	31 800.0	30 600.0
7	37 100.0	35 700.0
8	42 400.0	40 800.0
9	47 700.0	45 900.0

	49 000	47 000
1	4 900.0	4 700.0
2	9 800.0	9 400.0
3	14 700.0	14 100.0
4	19 600.0	18 800.0
5	24 500.0	23 500.0
6	29 400.0	28 200.0
7	34 300.0	32 900.0
8	39 200.0	37 600.0
9	44 100.0	42 300.0

1° 50′

′	″	Cot.	Diff.
50	0	31. 241 577	47 297
	10	.194 280	47 153
	20	.147 127	47 012
	30	.100 115	46 869
	40	.053 246	46 729
	50	.006 517	46 589
51	0	30. 959 928	46 449
	10	.913 479	46 310
	20	.867 169	46 171
	30	.820 998	46 034
	40	.774 964	45 897
	50	.729 067	45 760
52	0	30. 683 307	45 624
	10	.637 683	45 489
	20	.592 194	45 354
	30	.546 840	45 220
	40	.501 620	45 086
	50	.456 534	44 954
53	0	30. 411 580	44 821
	10	.366 759	44 689
	20	.322 070	44 558
	30	.277 512	44 428
	40	.233 084	44 297
	50	.188 787	44 168
54	0	30. 144 619	44 039
	10	.100 580	43 911
	20	.056 669	43 783
	30	.012 886	43 655
	40	29. 969 231	43 529
	50	.925 702	43 403
55	0	29. 882 299	43 278
	10	.839 021	43 152
	20	.795 869	43 028
	30	.752 841	42 904
	40	.709 937	42 780
	50	.667 157	42 658
56	0	29. 624 499	42 535
	10	.581 964	42 413
	20	.539 551	42 292
	30	.497 259	42 171
	40	.455 088	42 051
	50	.413 037	41 931
57	0	29. 371 106	41 812
	10	.329 294	41 694
	20	.287 600	41 575
	30	.246 025	41 457
	40	.204 568	41 340
	50	.163 228	41 223
58	0	29. 122 005	41 107
	10	.080 898	40 992
	20	.039 906	40 876
	30	28. 999 030	40 761
	40	.958 269	40 647
	50	.917 622	40 533
59	0	28. 877 089	40 420
	10	.836 669	40 307
	20	.796 362	40 195
	30	.756 167	40 082
	40	.716 085	39 971
	50	.676 114	39 861
60	0	28. 636 253	

Cotangent

	47 000	46 000
1	4 700.0	4 600.0
2	9 400.0	9 200.0
3	14 100.0	13 800.0
4	18 800.0	18 400.0
5	23 500.0	23 000.0
6	28 200.0	27 600.0
7	32 900.0	32 200.0
8	37 600.0	36 800.0
9	42 300.0	41 400.0

	45 000	44 000
1	4 500.0	4 400.0
2	9 000.0	8 800.0
3	13 500.0	13 200.0
4	18 000.0	17 600.0
5	22 500.0	22 000.0
6	27 000.0	26 400.0
7	31 500.0	30 800.0
8	36 000.0	35 200.0
9	40 500.0	39 600.0

	43 000	42 000
1	4 300.0	4 200.0
2	8 600.0	8 400.0
3	12 900.0	12 600.0
4	17 200.0	16 800.0
5	21 500.0	21 000.0
6	25 800.0	25 200.0
7	30 100.0	29 400.0
8	34 400.0	33 600.0
9	38 700.0	37 800.0

	41 000	40 000
1	4 100.0	4 000.0
2	8 200.0	8 000.0
3	12 300.0	12 000.0
4	16 400.0	16 000.0
5	20 500.0	20 000.0
6	24 600.0	24 000.0
7	28 700.0	28 000.0
8	32 800.0	32 000.0
9	36 900.0	36 000.0

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TABLE VI

STADIA REDUCTIONS

1. Stadia reductions.—Stadia work involves observing—

a. The angle by which the line of sight departs from a horizontal line. This reading is the argument for entering the table.

b. The rod interval intercepted by the stadia wires, which are usually adjusted so that the distance to the rod is exactly 100 times the reading on the rod when the telescope is level. This distance, however, is measured from the principal focus of the object glass, which is an appreciable distance to the front. Hence the reading must be increased by two small increments; first, the distance from the principal focus to the object glass, and, second, the distance from the object glass to the transit plumb line.

c. The table gives horizontal distances and differences of elevation for unit readings on rod and for angles of elevation from 0° to 30°. The three lines at foot of tables give three values for C; the value selected depends upon the instrument used; the quantity C includes the two increments described in the last sentence of *b* above.

d. Example: Rod reading is 3.25 feet and angle of inclination is 5° 35′; focal distance $C=1.00$.

Horizontal distance $=99.05\times3.25+0.99=322.90$ feet.
Difference of elevation $=9.68\times3.25+0.09=31.55$.

TABLE VI.—*Stadia reductions*

(Horizontal distances and elevations from stadia readings)

Minutes	0°		1°		2°		3°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	100.00	0.00	99.97	1.74	99.88	3.49	99.73	5.23
2	100.00	0.06	99.97	1.80	99.87	3.55	99.72	5.28
4	100.00	0.12	99.97	1.86	99.87	3.60	99.71	5.34
6	100.00	0.17	99.96	1.92	99.87	3.66	99.71	5.40
8	100.00	0.23	99.96	1.98	99.86	3.72	99.70	5.46
10	100.00	0.29	99.96	2.04	99.86	3.78	99.69	5.52
12	100.00	0.35	99.96	2.09	99.85	3.84	99.69	5.57
14	100.00	0.41	99.95	2.15	99.85	3.90	99.68	5.63
16	100.00	0.47	99.95	2.21	99.84	3.95	99.68	5.69
18	100.00	0.52	99.95	2.27	99.84	4.01	99.67	5.75
20	100.00	0.58	99.95	2.33	99.83	4.07	99.66	5.80
22	100.00	0.64	99.94	2.38	99.83	4.13	99.66	5.86
24	100.00	0.70	99.94	2.44	99.82	4.18	99.65	5.92
26	99.99	0.76	99.94	2.50	99.82	4.24	99.64	5.98
28	99.99	0.81	99.93	2.56	99.81	4.30	99.63	6.04
30	99.99	0.87	99.93	2.62	99.81	4.36	99.63	6.09
32	99.99	0.93	99.93	2.67	99.80	4.42	99.62	6.15
34	99.99	0.99	99.93	2.73	99.80	4.48	99.62	6.21
36	99.99	1.05	99.92	2.79	99.79	4.53	99.61	6.27
38	99.99	1.11	99.92	2.85	99.79	4.59	99.60	6.33
40	99.99	1.16	99.92	2.91	99.78	4.65	99.59	6.38
42	99.99	1.22	99.91	2.97	99.78	4.71	99.59	6.44
44	99.98	1.28	99.91	3.02	99.77	4.76	99.58	6.50
46	99.98	1.34	99.90	3.08	99.77	4.82	99.57	6.56
48	99.98	1.40	99.90	3.14	99.76	4.88	99.56	6.61
50	99.98	1.45	99.90	3.20	99.76	4.94	99.56	6.67
52	99.98	1.51	99.89	3.26	99.75	4.99	99.55	6.73
54	99.98	1.57	99.89	3.31	99.74	5.05	99.54	6.78
56	99.97	1.63	99.89	3.37	99.74	5.11	99.53	6.84
58	99.97	1.69	99.88	3.43	99.73	5.17	99.52	6.90
60	99.97	1.74	99.88	3.49	99.73	5.23	99.51	6.96
C=0.75	0.75	0.01	0.75	0.02	0.75	0.03	0.75	0.05
C=1.00	1.00	0.01	1.00	0.03	1.00	0.04	1.00	0.06
C=1.25	1.25	0.02	1.25	0.03	1.25	0.05	1.25	0.08

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TABLE VI.—*Stadia reductions*—Continued

2. Stadia reduction formulae.—The following formulae are used in computing stadia reductions:

Horizontal distance $= R \cos^2 \alpha + C \cos \alpha$.

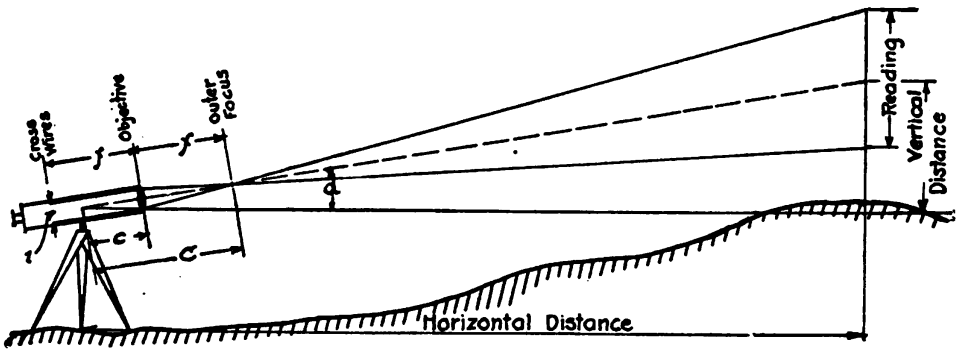
Vertical distance $= R \frac{1}{2} \sin 2\alpha + C \sin \alpha$.

R = Stadia reading $\times \frac{\text{distance from object glass to outer focus}}{\text{distance between cross hairs}} = S\frac{f}{i}$.

C = Distance (f) from object glass to outer focus + distance (c) from object glass to center of instrument $= f + c$.

α = angle of elevation for mid reading.

The distance (f) from object glass to outer focus is equal to the distance from object glass to cross wires.



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TABLE VI.—*Stadia reductions*—Continued

Minutes	4°		5°		6°		7°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	99.51	6.96	99.24	8.68	98.91	10.40	98.51	12.10
2	99.51	7.02	99.23	8.74	98.90	10.45	98.50	12.15
4	99.50	7.07	99.22	8.80	98.88	10.51	98.48	12.21
6	99.49	7.13	99.21	8.85	98.87	10.57	98.47	12.26
8	99.48	7.19	99.20	8.91	98.86	10.62	98.46	12.32
10	99.47	7.25	99.19	8.97	98.85	10.68	98.44	12.38
12	99.46	7.30	99.18	9.03	98.83	10.74	98.43	12.43
14	99.46	7.36	99.17	9.08	98.82	10.79	98.41	12.49
16	99.45	7.42	99.16	9.14	98.81	10.85	98.40	12.55
18	99.44	7.48	99.15	9.20	98.80	10.91	98.39	12.60
20	99.43	7.53	99.14	9.25	98.78	10.96	98.37	12.66
22	99.42	7.59	99.13	9.31	98.77	11.02	98.36	12.72
24	99.41	7.65	99.11	9.37	98.76	11.08	98.34	12.77
26	99.40	7.71	99.10	9.43	98.74	11.13	98.33	12.83
28	99.39	7.76	99.09	9.48	98.73	11.19	98.31	12.88
30	99.38	7.82	99.08	9.54	98.72	11.25	98.29	12.94
32	99.38	7.88	99.07	9.60	98.71	11.30	98.28	13.00
34	99.37	7.94	99.06	9.65	98.69	11.36	98.27	13.05
36	99.36	7.99	99.05	9.71	98.68	11.42	98.25	13.11
38	99.35	8.05	99.04	9.77	98.67	11.47	98.24	13.17
40	99.34	8.11	99.03	9.83	98.65	11.53	98.22	13.22
42	99.33	8.17	99.01	9.88	98.64	11.59	98.20	13.28
44	99.32	8.22	99.00	9.94	98.63	11.64	98.19	13.33
46	99.31	8.28	98.99	10.00	98.61	11.70	98.17	13.39
48	99.30	8.34	98.98	10.05	98.60	11.76	98.16	13.45
50	99.29	8.40	98.97	10.11	98.58	11.81	98.14	13.50
52	99.28	8.45	98.96	10.17	98.57	11.87	98.13	13.56
54	99.27	8.51	98.94	10.22	98.56	11.93	98.11	13.61
56	99.26	8.57	98.93	10.28	98.54	11.98	98.10	13.67
58	99.25	8.63	98.92	10.34	98.53	12.04	98.08	13.73
60	99.24	8.68	98.91	10.40	98.51	12.10	98.06	13.78
C=0.75	0.75	0.06	0.75	0.07	0.75	0.08	0.74	0.10
C=1.00	1.00	0.08	0.99	0.09	0.99	0.11	0.99	0.13
C=1.25	1.25	0.10	1.24	0.11	1.24	0.14	1.24	0.16

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TABLE VI.—*Stadia reductions*—Continued

Minutes	8°		9°		10°		11°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	98.06	13.78	97.55	15.45	96.98	17.10	96.36	18.73
2	98.05	13.84	97.53	15.51	96.96	17.16	96.34	18.78
4	98.03	13.89	97.52	15.56	96.94	17.21	96.32	18.84
6	98.01	13.95	97.50	15.62	96.92	17.26	96.29	18.89
8	98.00	14.01	97.48	15.67	96.90	17.32	96.27	18.95
10	97.98	14.06	97.46	15.73	96.88	17.37	96.25	19.00
12	97.97	14.12	97.44	15.78	96.86	17.43	96.23	19.05
14	97.95	14.17	97.43	15.84	96.84	17.48	96.21	19.11
16	97.93	14.23	97.41	15.89	96.82	17.54	96.18	19.16
18	97.92	14.28	97.39	15.95	96.80	17.59	96.16	19.21
20	97.90	14.34	97.37	16.00	96.78	17.65	96.14	19.27
22	97.88	14.40	97.35	16.06	96.76	17.70	96.12	19.32
24	97.87	14.45	97.33	16.11	96.74	17.76	96.09	19.38
26	97.85	14.51	97.31	16.17	96.72	17.81	96.07	19.43
28	97.83	14.56	97.29	16.22	96.70	17.86	96.05	19.48
30	97.82	14.62	97.28	16.28	96.68	17.92	96.03	19.54
32	97.80	14.67	97.26	16.33	96.66	17.97	96.00	19.59
34	97.78	14.73	97.24	16.39	96.64	18.03	95.98	19.64
36	97.76	14.79	97.22	16.44	96.62	18.08	95.96	19.70
38	97.75	14.84	97.20	16.50	96.60	18.14	95.93	19.75
40	97.73	14.90	97.18	16.55	96.57	18.19	95.91	19.80
42	97.71	14.95	97.16	16.61	96.55	18.24	95.89	19.86
44	97.69	15.01	97.14	16.66	96.53	18.30	95.86	19.91
46	97.68	15.06	97.12	16.72	96.51	18.35	95.84	19.96
48	97.66	15.12	97.10	16.77	96.49	18.41	95.82	20.02
50	97.64	15.17	97.08	16.83	96.47	18.46	95.79	20.07
52	97.62	15.23	97.06	16.88	96.45	18.51	95.77	20.12
54	97.61	15.28	97.04	16.94	96.42	18.57	95.75	20.18
56	97.59	15.34	97.02	16.99	96.40	18.62	95.72	20.23
58	97.57	15.40	97.00	17.05	96.38	18.68	95.70	20.28
60	97.55	15.45	96.98	17.10	96.36	18.73	95.68	20.34
C=0.75	0.74	0.11	0.74	0.12	0.74	0.14	0.73	0.15
C=1.00	0.99	0.15	0.99	0.16	0.98	0.18	0.98	0.20
C=1.25	1.23	0.18	1.23	0.21	1.23	0.23	1.22	0.25

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TABLE VI.—*Stadia reductions*—Continued

Minutes	12°		13°		14°		15°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	95.68	20.34	94.94	21.92	94.15	23.47	93.30	25.00
2	95.65	20.39	94.91	21.97	94.12	23.52	93.27	25.05
4	95.63	20.44	94.89	22.02	94.09	23.58	93.24	25.10
6	95.61	20.50	94.86	22.08	94.07	23.63	93.21	25.15
8	95.58	20.55	94.84	22.13	94.04	23.68	93.18	25.20
10	95.56	20.60	94.81	22.18	94.01	23.73	93.16	25.25
12	95.53	20.66	94.79	22.23	93.98	23.78	93.13	25.30
14	95.51	20.71	94.76	22.28	93.95	23.83	93.10	25.35
16	95.49	20.76	94.73	22.34	93.93	23.88	93.07	25.40
18	95.46	20.81	94.71	22.39	93.90	23.93	93.04	25.45
20	95.44	20.87	94.68	22.44	93.87	23.99	93.01	25.50
22	95.41	20.92	94.66	22.49	93.84	24.04	92.98	25.55
24	95.39	20.97	94.63	22.54	93.81	24.09	92.95	25.60
26	95.36	21.03	94.60	22.60	93.79	24.14	92.92	25.65
28	95.34	21.08	94.58	22.65	93.76	24.19	92.89	25.70
30	95.32	21.13	94.55	22.70	93.73	24.24	92.86	25.75
32	95.29	21.18	94.52	22.75	93.70	24.29	92.83	25.80
34	95.27	21.24	94.50	22.80	93.67	24.34	92.80	25.85
36	95.24	21.29	94.47	22.85	93.65	24.39	92.77	25.90
38	95.22	21.34	94.44	22.91	93.62	24.44	92.74	25.95
40	95.19	21.39	94.42	22.96	93.59	24.49	92.71	26.00
42	95.17	21.45	94.39	23.01	93.56	24.55	92.68	26.05
44	95.14	21.50	94.36	23.06	93.53	24.60	92.65	26.10
46	95.12	21.55	94.34	23.11	93.50	24.65	92.62	26.15
48	95.09	21.60	94.31	23.16	93.47	24.70	92.59	26.20
50	95.07	21.66	94.28	23.22	93.45	24.75	92.56	26.25
52	95.04	21.71	94.26	23.27	93.42	24.80	92.53	26.30
54	95.02	21.76	94.23	23.32	93.39	24.85	92.49	26.35
56	94.99	21.81	94.20	23.37	93.36	24.90	92.46	26.40
58	94.97	21.87	94.17	23.42	93.33	24.95	92.43	26.45
60	94.94	21.92	94.15	23.47	93.30	25.00	92.40	26.50
C=0.75	0.73	0.16	0.73	0.17	0.73	0.19	0.72	0.20
C=1.00	0.98	0.22	0.97	0.23	0.97	0.25	0.96	0.27
C=1.25	1.22	0.27	1.21	0.29	1.21	0.31	1.20	0.34

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TABLE VI.—*Stadia reductions*—Continued

Minutes	16°		17°		18°		19°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	92.40	26.50	91.45	27.96	90.45	29.39	89.40	30.78
2	92.37	26.55	91.42	28.01	90.42	29.44	89.36	30.83
4	92.34	26.59	91.39	28.06	90.38	29.48	89.33	30.87
6	92.31	26.64	91.35	28.10	90.35	29.53	89.29	30.92
8	92.28	26.69	91.32	28.15	90.31	29.58	89.26	30.97
10	92.25	26.74	91.29	28.20	90.28	29.62	89.22	31.01
12	92.22	26.79	91.26	28.25	90.24	29.67	89.18	31.06
14	92.19	26.84	91.22	28.30	90.21	29.72	89.15	31.10
16	92.15	26.89	91.19	28.34	90.18	29.76	89.11	31.15
18	92.12	26.94	91.16	28.39	90.14	29.81	89.08	31.19
20	92.09	26.99	91.12	28.44	90.11	29.86	89.04	31.24
22	92.06	27.04	91.09	28.49	90.07	29.90	89.00	31.28
24	92.03	27.09	91.06	28.54	90.04	29.95	88.96	31.33
26	92.00	27.13	91.02	28.58	90.00	30.00	88.93	31.38
28	91.97	27.18	90.99	28.63	89.97	30.04	88.89	31.42
30	91.93	27.23	90.96	28.68	89.93	30.09	88.86	31.47
32	91.90	27.28	90.92	28.73	89.90	30.14	88.82	31.51
34	91.87	27.33	90.89	28.77	89.86	30.19	88.78	31.56
36	91.84	27.38	90.86	28.82	89.83	30.23	88.75	31.60
38	91.81	27.43	90.82	28.87	89.79	30.28	88.71	31.65
40	91.77	27.48	90.79	28.92	89.76	30.32	88.67	31.69
42	91.74	27.52	90.76	28.96	89.72	30.37	88.64	31.74
44	91.71	27.57	90.72	29.01	89.69	30.41	88.60	31.78
46	91.68	27.62	90.69	29.06	89.65	30.46	88.56	31.83
48	91.65	27.67	90.66	29.11	89.61	30.51	88.53	31.87
50	91.61	27.72	90.62	29.15	89.58	30.55	88.49	31.92
52	91.58	27.77	90.59	29.20	89.54	30.60	88.45	31.96
54	91.55	27.81	90.55	29.25	89.51	30.65	88.41	32.01
56	91.52	27.86	90.52	29.30	89.47	30.69	88.38	32.05
58	91.48	27.91	90.48	29.34	89.44	30.74	88.34	32.09
60	91.45	27.96	90.45	29.39	89.40	30.78	88.30	32.14
C=0.75	0.72	0.21	0.72	0.23	0.71	0.24	0.71	0.25
C=1.00	0.96	0.28	0.95	0.30	0.95	0.32	0.94	0.33
C=1.25	1.20	0.35	1.19	0.38	1.19	0.40	1.18	0.42

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TABLE VI.—*Stadia reductions*—Continued

Minutes	20°		21°		22°		23°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	88.30	32.14	87.16	33.46	85.97	34.73	84.73	35.97
2	88.26	32.18	87.12	33.50	85.93	34.77	84.69	36.01
4	88.23	32.23	87.08	33.54	85.89	34.82	84.65	36.05
6	88.19	32.27	87.04	33.59	85.85	34.86	84.61	36.09
8	88.15	32.32	87.00	33.63	85.80	34.90	84.57	36.13
10	88.11	32.36	86.96	33.67	85.76	34.94	84.52	36.17
12	88.08	32.41	86.92	33.72	85.72	34.98	84.48	36.21
14	88.04	32.45	86.88	33.76	85.68	35.02	84.44	36.25
16	88.00	32.49	86.84	33.80	85.64	35.07	84.40	36.29
18	87.96	32.54	86.80	33.84	85.60	35.11	84.35	36.33
20	87.93	32.58	86.77	33.89	85.56	35.15	84.31	36.37
22	87.89	32.63	86.73	33.93	85.52	35.19	84.27	36.41
24	87.85	32.67	86.69	33.97	85.48	35.23	84.23	36.45
26	87.81	32.72	86.65	34.01	85.44	35.27	84.18	36.49
28	87.77	32.76	86.61	34.06	85.40	35.31	84.14	36.53
30	87.74	32.80	86.57	34.10	85.36	35.36	84.10	36.57
32	87.70	32.85	86.53	34.14	85.31	35.40	84.06	36.61
34	87.66	32.89	86.49	34.18	85.27	35.44	84.01	36.65
36	87.62	32.93	86.45	34.23	85.23	35.48	83.97	36.69
38	87.58	32.98	86.41	34.27	85.19	35.52	83.93	36.73
40	87.54	33.02	86.37	34.31	85.15	35.56	83.89	36.77
42	87.51	33.07	86.33	34.35	85.11	35.60	83.84	36.80
44	87.47	33.11	86.29	34.40	85.07	35.64	83.80	36.84
46	87.43	33.15	86.25	34.44	85.02	35.68	83.76	36.88
48	87.39	33.20	86.21	34.48	84.98	35.72	83.72	36.92
50	87.35	33.24	86.17	34.52	84.94	35.76	83.67	36.96
52	87.31	33.28	86.13	34.57	84.90	35.80	83.63	37.00
54	87.27	33.33	86.09	34.61	84.86	35.85	83.59	37.04
56	87.24	33.37	86.05	34.65	84.82	35.89	83.54	37.08
58	87.20	33.41	86.01	34.69	84.77	35.93	83.50	37.12
60	87.16	33.46	85.97	34.73	84.73	35.97	83.46	37.16
C=0.75	0.70	0.26	0.70	0.27	0.69	0.29	0.69	0.30
C=1.00	0.94	0.35	0.93	0.37	0.92	0.38	0.92	0.40
C=1.25	1.17	0.44	1.16	0.46	1.15	0.48	1.15	0.50

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TABLE VI.—*Stadia reductions*—Continued

Minutes	24°		25°		26°		27°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	83.46	37.16	82.14	38.30	80.78	39.40	79.39	40.45
2	83.41	37.20	82.09	38.34	80.74	39.44	79.34	40.49
4	83.37	37.23	82.05	38.38	80.69	39.47	79.30	40.52
6	83.33	37.27	82.01	38.41	80.65	39.51	79.25	40.55
8	83.28	37.31	81.96	38.45	80.60	39.54	79.20	40.59
10	83.24	37.35	81.92	38.49	80.55	39.58	79.15	40.62
12	83.20	37.39	81.87	38.53	80.51	39.61	79.11	40.66
14	83.15	37.43	81.83	38.56	80.46	39.65	79.06	40.69
16	83.11	37.47	81.78	38.60	80.41	39.69	79.01	40.72
18	83.07	37.51	81.74	38.64	80.37	39.72	78.96	40.76
20	83.02	37.54	81.69	38.67	80.32	39.76	78.92	40.79
22	82.98	37.58	81.65	38.71	80.28	39.79	78.87	40.82
24	82.93	37.62	81.60	38.75	80.23	39.83	78.82	40.86
26	82.89	37.66	81.56	38.78	80.18	39.86	78.77	40.89
28	82.85	37.70	81.51	38.82	80.14	39.90	78.73	40.92
30	82.80	37.74	81.47	38.86	80.09	39.93	78.68	40.96
32	82.76	37.77	81.42	38.89	80.04	39.97	78.63	40.99
34	82.72	37.81	81.38	38.93	80.00	40.00	78.58	41.02
36	82.67	37.85	81.33	38.97	79.95	40.04	78.54	41.06
38	82.63	37.89	81.28	39.00	79.90	40.07	78.49	41.09
40	82.58	37.93	81.24	39.04	79.86	40.11	78.44	41.12
42	82.54	37.96	81.19	39.08	79.81	40.14	78.39	41.16
44	82.49	38.00	81.15	39.11	79.76	40.18	78.34	41.19
46	82.45	38.04	81.10	39.15	79.72	40.21	78.30	41.22
48	82.41	38.08	81.06	39.18	79.67	40.24	78.25	41.26
50	82.36	38.11	81.01	39.22	79.62	40.28	78.20	41.29
52	82.32	38.15	80.97	39.26	79.58	40.31	78.15	41.32
54	82.27	38.19	80.92	39.29	79.53	40.35	78.10	41.35
56	82.23	38.23	80.87	39.33	79.48	40.38	78.06	41.39
58	82.18	38.26	80.83	39.36	79.44	40.42	78.01	41.42
60	82.14	38.30	80.78	39.40	79.39	40.45	77.96	41.45
C=0.75	0.68	0.31	0.68	0.32	0.67	0.33	0.66	0.35
C=1.00	0.91	0.41	0.90	0.43	0.89	0.45	0.89	0.46
C=1.25	1.14	0.52	1.13	0.54	1.12	0.56	1.11	0.58

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TABLE VI.—*Stadia reductions*—Continued

Minutes	28°		29°		30°	
	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.	Hor. dist.	Diff. elev.
0	77.96	41.45	76.50	42.40	75.00	43.30
2	77.91	41.48	76.45	42.43	74.95	43.33
4	77.86	41.52	76.40	42.46	74.90	43.36
6	77.81	41.55	76.35	42.49	74.85	43.39
8	77.77	41.58	76.30	42.53	74.80	43.42
10	77.72	41.61	76.25	42.56	74.75	43.45
12	77.67	41.65	76.20	42.59	74.70	43.47
14	77.62	41.68	76.15	42.62	74.65	43.50
16	77.57	41.71	76.10	42.65	74.60	43.53
18	77.52	41.74	76.05	42.68	74.55	43.56
20	77.48	41.77	76.00	42.71	74.49	43.59
22	77.42	41.81	75.95	42.74	74.44	43.62
24	77.38	41.84	75.90	42.77	74.39	43.65
26	77.33	41.87	75.85	42.80	74.34	43.67
28	77.28	41.90	75.80	42.83	74.29	43.70
30	77.23	41.93	75.75	42.86	74.24	43.73
32	77.18	41.97	75.70	42.89	74.19	43.76
34	77.13	42.00	75.65	42.92	74.14	43.79
36	77.09	42.03	75.60	42.95	74.09	43.82
38	77.04	42.06	75.55	42.98	74.04	43.84
40	76.99	42.09	75.50	43.01	73.99	43.87
42	76.94	42.12	75.45	43.04	73.93	43.90
44	76.89	42.15	75.40	43.07	73.88	43.93
46	76.84	42.19	75.35	43.10	73.83	43.95
48	76.79	42.22	75.30	43.13	73.78	43.98
50	76.74	42.25	75.25	43.16	73.73	44.01
52	76.69	42.28	75.20	43.18	73.68	44.04
54	76.64	42.31	75.15	43.21	73.63	44.07
56	76.59	42.34	75.10	43.24	73.58	44.09
58	76.55	42.37	75.05	43.27	73.52	44.12
60	76.50	42.40	75.00	43.30	73.47	44.15
C=0.75	0.66	0.36	0.65	0.37	0.65	0.38
C=1.00	0.88	0.48	0.87	0.49	0.86	0.51
C=1.25	1.10	0.60	1.09	0.62	1.08	0.64

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TABLE VII

ELEVATIONS ABOVE SEA LEVEL FROM BAROMETER READINGS

(Arranged in order of increasing barometer readings and decreasing altitudes)

Barometer reading	Altitude above sea level	Diff. for 0.01″	Barometer reading	Altitude above sea level	Diff. for 0.01″	Barometer reading	Altitude above sea level	Diff. for 0.01″
Inches	*Feet*	*Feet*	*Inches*	*Feet*	*Feet*	*Inches*	*Feet*	*Feet*
18.0	13,918	−15.1	22.2	8,204	−12.2	26.4	3,483	−10.3
.1	13,767	15.0	.3	8,082	12.2	.5	3,380	10.3
.2	13,617	14.9	.4	7,960	12.2	.6	3,277	10.2
.3	13,468	14.9	.5	7,838	12.1	.7	3,175	10.2
.4	13,319	14.7	.6	7,717	12.0	.8	3,073	10.1
.5	13,172	14.7	.7	7,597	12.0	.9	2,972	10.1
.6	13,025	14.6	.8	7,477	11.9	27.0	2,871	10.1
.7	12,879	14.6	.9	7,358	11.9	.1	2,770	10.0
.8	12,733	14.4	23.0	7,239	11.8	.2	2,670	10.0
.9	12,589	14.4	.1	7,121	11.7	.3	2,570	10.0
19.0	12,445	14.3	.2	7,004	11.7	.4	2,470	9.9
.1	12,302	14.2	.3	6,887	11.7	.5	2,371	9.9
.2	12,160	14.2	.4	6,770	11.6	.6	2,272	9.9
.3	12,018	14.1	.5	6,654	11.6	.7	2,173	9.9
.4	11,877	14.0	.6	6,538	11.5	.8	2,075	9.8
.5	11,737	13.9	.7	6,423	11.5	.9	1,977	9.8
.6	11,598	13.9	.8	6,308	11.4	28.0	1,880	9.7
.7	11,459	13.8	.9	6,194	11.4	.1	1,783	9.7
.8	11,321	13.7	24.0	6,080	11.3	.2	1,686	9.7
.9	11,184	13.7	.1	5,967	11.3	.3	1,589	9.7
20.0	11,047	13.6	.2	5,854	11.3	.4	1,493	9.6
.1	10,911	13.5	.3	5,741	11.2	.5	1,397	9.6
.2	10,776	13.4	.4	5,629	11.1	.6	1,302	9.5
.3	10,642	13.4	.5	5,518	11.1	.7	1,207	9.5
.4	10,508	13.3	.6	5,407	11.1	.8	1,112	9.5
.5	10,375	13.3	.7	5,296	11.0	.9	1,018	9.4
.6	10,242	13.2	.8	5,186	10.9	29.0	924	9.4
.7	10,110	13.1	.9	5,077	10.9	.1	830	9.4
.8	9,979	13.1	25.0	4,968	10.9	.2	736	9.3
.9	9,848	13.0	.1	4,859	10.8	.3	643	9.3
21.0	9,718	12.9	.2	4,751	10.8	.4	550	9.2
.1	9,589	12.9	.3	4,643	10.8	.5	458	9.2
.2	9,460	12.8	.4	4,535	10.7	.6	366	9.2
.3	9,332	12.8	.5	4,428	10.7	.7	274	9.2
.4	9,204	12.7	.6	4,321	10.6	.8	182	9.1
.5	9,077	12.6	.7	4,215	10.6	.9	91	9.1
.6	8,951	12.6	.8	4,109	10.5	30.0	00	9.1
.7	8,825	12.5	.9	4,004	10.5	.1	−91	9.0
.8	8,700	12.5	26.0	3,899	10.5	.2	−181	9.0
.9	8,575	12.4	.1	3,794	10.4	.3	−271	9.0
22.0	8,451	12.4	.2	3,690	10.4	.4	−361	9.0
.1	8,327	12.3	.3	3,586	10.3	.5	−451	8.9

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TABLE VIII

COEFFICIENTS FOR TEMPERATURE CORRECTIONS, BAROMETRIC

(Argument $(t+t')$ = sum of temperatures at the two stations)

$t+t'$	Coefficient C.	$t+t'$	Coefficient C.	$t+t'$	Coefficient C.
°		°		°	
0	−0.1024	60	−0.0380	120	+0.0262
10	−0.0915	70	−0.0273	130	+0.0368
20	−0.0806	80	−0.0166	140	+0.0472
30	−0.0698	90	−0.0058	150	+0.0575
40	−0.0592	100	+0.0049	160	+0.0677
50	−0.0486	110	+0.0156	170	+0.0779
60	−0.0380	120	+0.0262	180	+0.0879

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TABLE IX

CONVERSION OF METERS TO FEET

(Lengths: 1 to 1000 units. Reduction factor: 1 meter=3.280833333 feet)

Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
0		**50**	164.04167	**100**	328.08333	**150**	492.12500	**200**	656.16667
1	3.28083	1	167.32250	1	331.36417	1	495.40583	1	659.44750
2	6.56167	2	170.60333	2	334.64500	2	498.68667	2	662.72833
3	9.84250	3	173.88417	3	337.92583	3	501.96750	3	666.00917
4	13.12333	4	177.16500	4	341.20667	4	505.24833	4	669.29000
5	16.40417	5	180.44583	5	344.48750	5	508.52917	5	672.57083
6	19.68500	6	183.72667	6	347.76833	6	511.81000	6	675.85167
7	22.96583	7	187.00750	7	351.04917	7	515.09083	7	679.13250
8	26.24667	8	190.28833	8	354,33000	8	518,37167	8	682.41333
9	29.52750	9	193.56917	9	357.61083	9	521.65250	9	685.69417
10	32.80833	**60**	196.85000	**110**	360.89167	**160**	524.93333	**210**	688.97500
1	36.08917	1	200.13083	1	364.17250	1	528.21417	1	692.25583
2	39.37000	2	203.41167	2	367.45333	2	531.49500	2	695.53667
3	42.65083	3	206.69250	3	370.73417	3	534.77583	3	698.81750
4	45.93167	4	209.97333	4	374.01500	4	538.05667	4	702.09833
5	49.21250	5	213.25417	5	377.29583	5	541.33750	5	705 37917
6	52.49333	6	216.53500	6	380.57667	6	544.61833	6	708.66000
7	55.77417	7	219.81583	7	383.85750	7	547.89917	7	711.94083
8	59.05500	8	223.09667	8	387.13833	8	551.18000	8	715.22167
9	62.33583	9	226.37750	9	390.41917	9	554.46083	9	718.50250
20	65.61667	**70**	229.65833	**120**	393.70000	**170**	557.74167	**220**	721.78333
1	68.89750	1	232.93917	1	396.98083	1	561.02250	1	725.06417
2	72.17833	2	236.22000	2	400.26167	2	564.30333	2	728.34500
3	75.45917	3	239.50083	3	403.54250	3	567.58417	3	731.62583
4	78.74000	4	242.78167	4	406.82333	4	570.86500	4	734.90667
5	82.02083	5	246.06250	5	410.10417	5	574.14583	5	738.18750
6	85.30167	6	249.34333	6	413.38500	6	577.42667	6	741.46833
7	88.58250	7	252.62417	7	416.66583	7	580.70750	7	744.74917
8	91.86333	8	255.90500	8	419.94667	8	583.98833	8	748.03000
9	95.14417	9	259.18583	9	423.22750	9	587.26917	9	751.31083
30	98.42500	**80**	262.46667	**130**	426.50833	**180**	590.55000	**230**	754.59167
1	101.70583	1	265.74750	1	429.78917	1	593.83083	1	757.87250
2	104.98667	2	269.02833	2	433.07000	2	597.11167	2	761.15333
3	108.26750	3	272.30917	3	436.35083	3	600.39250	3	764.43417
4	111.54833	4	275.59000	4	439.63167	4	603.67333	4	767.71500
5	114.82917	5	278.87083	5	442.91250	5	606.95417	5	770.99583
6	118.11000	6	282.15167	6	446.19333	6	610.23500	6	774.27667
7	121.39083	7	285.43250	7	449.47417	7	613.51583	7	777.55750
8	124.67167	8	288.71333	8	452.75500	8	616.79667	8	780.83833
9	127.95250	9	291.99417	9	456.03583	9	620.07750	9	784.11917
40	131.23333	**90**	295.27500	**140**	459.31667	**190**	623.35833	**240**	787.40000
1	134.51417	1	298.55583	1	462.59750	1	626,63917	1	790.68083
2	137.79500	2	301.83667	2	465.87833	2	629.92000	2	793.96167
3	141.07583	3	305.11750	3	469.15917	3	633.20083	3	797.24250
4	144.35667	4	308.39833	4	472.44000	4	636.48167	4	800.52333
5	147.63750	5	311.67917	5	475.72083	5	639.76250	5	803.80417
6	150.91833	6	314.96000	6	479.00167	6	643.04333	6	807.08500
7	154.19917	7	318.24083	7	482.28250	7	646.32417	7	810.36583
8	157.48000	8	321.52167	8	485.56333	8	649.60500	8	813.64667
9	160.76083	9	324.80250	9	488.84417	9	652.88583	9	816.92750

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TABLE IX.—*Conversion of meters to feet*—Continued

Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
250	820.20833	**300**	984.25000	**350**	1,148.29167	**400**	1,312.33333	**450**	1,476.37500
1	823.48917	1	987.53083	1	1,151.57250	1	1,315.61417	1	1,479.65583
2	826.77000	2	990.81167	2	1,154.85333	2	1,318.89500	2	1,482.93667
3	830.05083	3	994.09250	3	1,158.13417	3	1,322.17583	3	1,186.21750
4	833.33167	4	997.37333	4	1,161.41500	4	1,325.45667	4	1,489.49833
5	836.61250	5	1,000.65417	5	1,164.69583	5	1,328.73750	5	1,492.77917
6	839.89333	6	1,003.93500	6	1,167.97667	6	1,332.01833	6	1,496.06000
7	843.17417	7	1,007.21583	7	1,171.25750	7	1,335.29917	7	1,499.34083
8	846.45500	8	1,010.49667	8	1,174.53833	8	1,338.58000	8	1,502.62167
9	849.73583	9	1,013.77750	9	1,177.81917	9	1,341.86083	9	1,505.90250
260	853.01667	**310**	1,017.05833	**360**	1,181.10000	**410**	1,345.14167	**460**	1,509.18333
1	856.29750	1	1,020.33917	1	1,184,38083	1	1,348.42250	1	1,512.46417
2	859.57833	2	1,023.62000	2	1,187.66167	2	1,351.70333	2	1,515.74500
3	862.85917	3	1,026.90083	3	1,190.94250	3	1,354.98417	3	1,519.02583
4	866.14000	4	1,030.18167	4	1,194.22333	4	1,358.26500	4	1,522.30667
5	869.42083	5	1,033.46250	5	1,197.50417	5	1,361.54583	5	1,525.58750
6	872.70167	6	1,036.74333	6	1,200.78500	6	1,364.82667	6	1,528.86833
7	875.98250	7	1,040.02417	7	1,204.06583	7	1,368.10750	7	1,532.14917
8	879.26333	8	1,043.30500	8	1,207.34667	8	1,371.38833	8	1,535.43000
9	882.54417	9	1,046.58583	9	1,210.62750	9	1,374.66917	9	1,538.71083
270	885,82500	**320**	1,049.86667	**370**	1,213.90833	**420**	1,377.95000	**470**	1,541.99167
1	889.10583	1	1,053.14750	1	1,217.18917	1	1,381.23083	1	1,545.27250
2	892.38667	2	1,056.42833	2	1,220.47000	2	1,384.51167	2	1,548.55333
3	895.66750	3	1,059.70917	3	1,223.75083	3	1,387.79250	3	1,551.83417
4	898.94833	4	1,062.99000	4	1,227.03167	4	1,391.07333	4	1,555.11500
5	902.22917	5	1,066.27083	5	1,230.31250	5	1,394.35417	5	1,558.39583
6	905.51000	6	1,069.55167	6	1,233.59333	6	1,397.63500	6	1,561.67667
7	908.79083	7	1,072.83250	7	1,236.87417	7	1,400.91583	7	1,564.95750
8	912.07167	8	1,076.11333	8	1,240.15500	8	1,404.19667	8	1,568.23833
9	915.35250	9	1,079.39417	9	1,243.43583	9	1,407.47750	9	1,571.51917
280	918.63333	**330**	1,082.67500	**380**	1,246.71667	**430**	1,410.75833	**480**	1,574.80000
1	921.91417	1	1,085.95583	1	1,249.99750	1	1,414.03917	1	1,578.08083
2	925.19500	2	1,089.23667	2	1,253.27833	2	1,417.32000	2	1,581.36167
3	928.47583	3	1,092.51750	3	1,256.55917	3	1,420.60083	3	1,584.64250
4	931.75667	4	1,095.79833	4	1,259.84000	4	1,423.88167	4	1,587.92333
5	935.03750	5	1,099.07917	5	1,263.12083	5	1,427.16250	5	1,591.20417
6	938.31833	6	1,012.36000	6	1,266.40167	6	1,430.44333	6	1,594.48500
7	941.59917	7	1,105.64083	7	1,269.68250	7	1,433.72417	7	1,597.76583
8	944.88000	8	1,108.92167	8	1,272.96333	8	1,437.00500	8	1,601.04667
9	948.16083	9	1,112.20250	9	1,276.24417	9	1,440.28583	9	1,604.32750
290	951.44167	**240**	1,115.48333	**390**	1,279.52500	**440**	1,443.56667	**490**	1,607.60833
1	954.72250	1	1,118.76417	1	1,282.80583	1	1,446.84750	1	1,610.88917
2	958.00333	2	1,122.04500	2	1,286.08667	2	1,450.12833	2	1,614.17000
3	961.28417	3	1,125.32583	3	1,289.36750	3	1,453.40917	3	1,617.45083
4	964.56500	4	1,128.60667	4	1,292.64833	4	1,456.69000	4	1,620.73167
5	967.84583	5	1,131.88750	5	1,295.92917	5	1,459.97083	5	1,624.01250
6	771.12667	6	1,135.16833	6	1,299.21000	6	1,463.25167	6	1,627.29333
7	974.40750	7	1,138.44917	7	1,302.49083	7	1,466.53250	7	1,630.57417
8	977.68833	8	1,141.73000	8	1,305.77167	8	1,469.81333	8	1,633.85500
9	980.96917	9	1,145.01083	9	1,309.05250	9	1,473.09417	9	1,637.13583

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TABLE IX.—*Conversion of meters to feet*—Continued

Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
500	1,640.41667	**550**	1,804.45833	**600**	1,968.50000	**650**	2,132,54167	**700**	2,296.58333
1	1,643.69750	1	1,807.73917	1	1,971.78083	1	2,135.82250	1	2,299.86417
2	1,646.97833	2	1,811.02000	2	1,975.06167	2	2,139.10333	2	2,303.14500
3	1,650.25917	3	1,814.30083	3	1,978.34250	3	2,142.38417	3	2,306.42583
4	1,653.54000	4	1,817.58167	4	1,981.62333	4	2,145.66500	4	2,309.70667
5	1,656.82083	5	1,820.86250	5	1,984.90417	5	2,148.94583	5	2,312 98750
6	1,660.10167	6	1,824.14333	6	1,988.18500	6	2,152.22667	6	2,316.26833
7	1,663.38250	7	1,827.42417	7	1,991.46583	7	2,155.50750	7	2,319.54917
8	1,666.66333	8	1,830.70500	8	1,994.74667	8	2,158.78833	8	2,322.83000
9	1,669.94417	9	1,833 98583	9	1,998.02750	9	2,162.06917	9	2,326.11083
510	1,673.22500	**560**	1,837.26667	**610**	2,001.30833	**660**	2,165.35000	**710**	2,329 39167
1	1,676.50583	1	1,840.54750	1	2,004.58917	1	2,168.63083	1	2,332.67250
2	1,679.78667	2	1,843.82833	2	2,007.87000	2	2,171.91167	2	2,335.95333
3	1,683.06750	3	1,847.10917	3	2,011.15083	3	2,175.19250	3	2,339.23417
4	1,686.34833	4	1,850.39000	4	2,014.43167	4	2,178.47333	4	2,342.51500
5	1,689.62917	5	1,853.67083	5	2,017.71250	5	2,181.75417	5	2,345.79583
6	1,692.91000	6	1,856.95167	6	2,020.99333	6	2,185.03500	6	2,349.07667
7	1,696.19083	7	1,860.23250	7	2,024 27417	7	2,188.31583	7	2,352.35750
8	1,699.47167	8	1,863.51333	8	2,027.55500	8	2,191.59667	8	2,355.63833
9	1,702.75250	9	1,866.79417	9	2,030.83583	9	2,194.87750	9	2,358.91917
520	1,706.03333	**570**	1,870.07500	**620**	2,034.11667	**670**	2,198.15833	**720**	2,362.20000
1	1,709.31417	1	1,873.35583	1	2,037.39750	1	2,201.43917	1	2,365.48083
2	1,712.59500	2	1,876.63667	2	2,040.67833	2	2,204.72000	2	2,368.76167
3	1,715.87583	3	1,879.91750	3	2,043.95917	3	2,208.00083	3	2,372.04250
4	1,719.15667	4	1,883.19833	4	2,047.24000	4	2,211.28167	4	2,375.32333
5	1,722.43750	5	1,886.47917	5	2,050.52083	5	2,214.56250	5	2,378.60417
6	1,725.71833	6	1,889.76000	6	2,053.80167	6	2,217.84333	6	2,381.88500
7	1,728.99917	7	1,893.04083	7	2,057.08250	7	2,221.12417	7	2,385.16583
8	1,732.28000	8	1,896.32167	8	2,060.36333	8	2,224.40500	8	2,388.44667
9	1,735.56083	9	1,899.60250	9	2,063.64417	9	2,227.68583	9	2,391.72750
530	1,738.84167	**580**	1,902.88333	**630**	2,066.92500	**680**	2,230.96667	**730**	2,395.00833
1	1,742.12250	1	1,906.16417	1	2,070.20583	1	2,234.24750	1	2,398.28917
2	1,745.40333	2	1,909.44500	2	2,073.48667	2	2,237.52833	2	2,401.57000
3	1,748.68417	3	1,912.72583	3	2,076.76750	3	2,240.80917	3	2,404.85083
4	1,751.96500	4	1,916.00667	4	2,080.04833	4	2,244.09000	4	2,408.13167
5	1,755.24583	5	1,919.28750	5	2,083.32917	5	2,247.37083	5	2,411.41250
6	1,758.52667	6	1,922.56833	6	2,086.61000	6	2,250.65167	6	2,414.69333
7	1,761.80750	7	1,925.84917	7	2,089.89083	7	2,253.93250	7	2,417.97417
8	1,765.08833	8	1,929.13000	8	2,093.17167	8	2,257.21333	8	2,421.25500
9	1,768.36917	9	1,932.41083	9	2,096.45250	9	2,260.49417	9	2,424.53583
540	1,771.65000	**590**	1,935.69167	**640**	2,099.73333	**690**	2,263.77500	**740**	2,427.81667
1	1,774.93083	1	1,938.97250	1	2,103.01417	1	2,267.05583	1	2,431.09750
2	1,778.21167	2	1,942.25333	2	2,106.29500	2	2,270.33667	2	2,434.37833
3	1,781.49250	3	1,945.53417	3	2,109.57583	3	2,273.61750	3	2,437.65917
4	1,784.77333	4	1,948.81500	4	2,112.85667	4	2,276.89833	4	2,440.94000
5	1,788.05417	5	1,952.09583	5	2,116.13750	5	2,280.17917	5	2,444.22083
6	1,791.33500	6	1,955.37667	6	2,119.41833	6	2,283.46000	6	2,447.50167
7	1,794.61583	7	1,958.65750	7	2,122.69917	7	2,286.74083	7	2,450.78250
8	1,797.89667	8	1,961.93833	8	2,125.98000	8	2,290.02167	8	2,454.06333
9	1,801.17750	9	1,965.21917	9	2,129.26083	9	2,293.30250	9	2,457.34417

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TABLE IX.—*Conversion of meters to feet*—Continued

Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet
750	2,460.62500	**800**	2,624.66667	**850**	2,788.70833	**900**	2,952,75000	**950**	3,116.79167
1	2,463.90583	1	2,627.94750	1	2,791.98917	1	2,956.03083	1	3,120.07250
2	2,467.18667	2	2,631.22833	2	2,795.27000	2	2,959.31167	2	3,123.35333
3	2,470.46750	3	2,634.50917	3	2,798.55083	3	2,962.59250	3	3,126.63417
4	2,473.74833	4	2,637.79000	4	2,801.83167	4	2,965.87333	4	3,129.91500
5	2,477.02917	5	2,641.07083	5	2,805.11250	5	2,969.15417	5	3,133.19583
6	2,480.31000	6	2,644.35167	6	2,808.39333	6	2,972.43500	6	3,136.47667
7	2,483.59083	7	2,647.63250	7	2,811.67417	7	2,975.71583	7	3,139.75750
8	2,486.87167	8	2,650.91333	8	2,814.95500	8	2,978.99667	8	3,143.03833
9	2,490.15250	9	2,654.19417	9	2,818.23583	9	2,982.27750	9	3,146.31917
760	2,493.43333	**810**	2,657.47500	**860**	2,821.51667	**910**	2,985.55833	**960**	3,149.60000
1	2,496.71417	1	2,660.75583	1	2,824.79750	1	2,988.83917	1	3,152.88083
2	2,499.99500	2	2,664.03667	2	2,828.07833	2	2,992.12000	2	3,156.16167
3	2,503.27583	3	2,667.31750	3	2,831.35917	3	2,995.40083	3	3,159.44250
4	2,506.55667	4	2,670.59833	4	2,834.64000	4	2,998.68167	4	3,162.72333
5	2,509.83750	5	2,673.87917	5	2,837.92083	5	3,001.96250	5	3,166.00417
6	2,513.11833	6	2,677.16000	6	2,841.20167	6	3,005.24333	6	3,169.28500
7	2,516.39917	7	2,680.44083	7	2,844.48250	7	3,008.52417	7	3,172.56583
8	2,519.68000	8	2,683.72167	8	2,847.76333	8	3,011.80500	8	3,175.84667
9	2,522.96083	9	2,687.00250	9	2,851.04417	9	3,015.08583	9	3,179.12750
770	2,526.24167	**820**	2,690.28333	**870**	2,854.32500	**920**	3,018.36667	**970**	3,182.40833
1	2,529.52250	1	2,693.56417	1	2,857.60583	1	3,021.64750	1	3,185.68917
2	2,532.80333	2	2,696.84500	2	2,860.88667	2	3,024.92833	2	2,188.97000
3	2,536.08417	3	2,700.12583	3	2,864.16750	3	3,028.20917	3	3,192.25083
4	2,539.36500	4	2,703.40667	4	2,867.44833	4	3,031.49000	4	3,195.53167
5	2,542.64583	5	2,706.68750	5	2,870.72917	5	3,034.77083	5	3,198.81250
6	2,545.92667	6	2,709.96833	6	2,874.01000	6	3,038.05167	6	3,202.09333
7	2,549.20750	7	2,713.24917	7	2,877.29083	7	3,041.33250	7	3,205.37417
8	2,552.48833	8	2,716.53000	8	2,880.57167	8	3,044.61333	8	3,208.65500
9	2,555.76917	9	2,719.81083	9	2,883.85250	9	3,047.89417	9	3,211.93583
780	2,559.05000	**830**	2,723.09167	**880**	2,887.13333	**930**	3,051.17500	**980**	3,215.21667
1	2,562.33083	1	2,726.37250	1	2,890.41417	1	3,054.45583	1	3,218.49750
2	2,565.61167	2	2,729.65333	2	2,893.69500	2	3,057.73667	2	3,221.77833
3	2,568.89250	3	2,732.93417	3	2,896.97583	3	3,061.01750	3	3,225.05917
4	2,572.17333	4	2,736.21500	4	2,900.25667	4	3,064.29833	4	3,228.34000
5	2,575.45417	5	2,739.49583	5	2,903.53750	5	3,067.57917	5	3,231.62083
6	2,578.73500	6	2,742.77667	6	2,906.81833	6	3,070.86000	6	3,234.90167
7	2,582.01583	7	2,746.05750	7	2,910.09917	7	3,074.14083	7	3,238.18250
8	2,585.29667	8	2,749.33833	8	2,913.38000	8	3,077.42167	8	3,241.46333
9	2,588.57750	9	2,752.61917	9	2,916.66083	9	3,080.70250	9	3,244.74417
790	2,591.85833	**840**	2,755.90000	**890**	2,919.94167	**940**	3,083.98333	**990**	3,248.02500
1	2,595.13917	1	2,759.18083	1	2,923.22250	1	3,087.26417	1	3,251.30583
2	2,598.42000	2	2,762.46167	2	2,926.50333	2	3,090.54500	2	3,254.58667
3	2,601.70083	3	2,765.74250	3	2,929.78417	3	3,093.82583	3	3,257.86750
4	2,604.98167	4	2,769.02333	4	2,933.06500	4	3,097.10667	4	3,261.14833
5	2,608.26250	5	2,772.30417	5	2,936.34583	5	3,100.38750	5	3,264.42917
6	2,611.54333	6	2,775.58500	6	2,939.62667	6	3,103.66833	6	3,267.71000
7	2,614.82417	7	2,778.86583	7	2,942.90750	7	3,106.94917	7	3,270.99083
8	2,618.10500	8	2,782.14667	8	2,946.18833	8	3,110.23000	8	3,274.27167
9	2,621.38583	9	2,785.42750	9	2,949.46917	9	3,113.51083	9	3,277.55250

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TABLE X

CONVERSION OF FEET TO METERS

(Lengths: 1 to 1,000 units. Reduction factor: 1 foot = 0.3048006096 meter)

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
0	0.0	**50**	15.24003	**100**	30.48006	**150**	45.72009	**200**	60.96012
1	0.30480	1	15.54483	1	30.78486	1	46.02489	1	61.26492
2	0.60960	2	15.84963	2	31.08966	2	46.32969	2	61.56972
3	0.91440	3	16.15443	3	31.39446	3	46.63449	3	61.87452
4	1.21920	4	16.45923	4	31.69926	4	46.93929	4	62.17932
5	1.52400	**5**	16.76403	**5**	32.00406	**5**	47.24409	**5**	62.48412
6	1.82880	6	17.06883	6	32.30886	6	47.54890	6	62.78893
7	2.13360	7	17.37363	7	32.61367	7	47.85370	7	63.09373
8	2.43840	8	17.67844	8	32.91847	8	48.15850	8	63.39853
9	2.74321	9	17.98324	9	33.22327	9	48.46330	9	63.70333
10	3.04801	**60**	18.28804	**110**	33.52807	**160**	48.76810	**210**	64.00813
1	3.35281	1	18.59284	1	33.83287	1	49.07290	1	64.31293
2	3.65761	2	18.89764	2	34.13767	2	49.37770	2	64.61773
3	3.96241	3	19.20244	3	34.44247	3	49.68250	3	64.92253
4	4.26721	4	19.50724	4	34.74727	4	49.98730	4	65.22733
5	4.57201	**5**	19.81204	**5**	35.05207	**5**	50.29210	**5**	65.53213
6	4.87681	6	20.11684	6	35.35687	6	50.59690	6	65.83693
7	5.18161	7	20.42164	7	35.66167	7	50.90170	7	66.14173
8	5.48641	8	20.72644	8	35.96647	8	51.20650	8	66.44653
9	5.79121	9	21.03124	9	36.27127	9	51.51130	9	66.75133
20	6.09601	**70**	21.33604	**120**	36.57607	**170**	51.81610	**220**	67.05613
1	6.40081	1	21.64084	1	36.88087	1	52.12090	1	67.36093
2	6.70561	2	21.94564	2	37.18567	2	52.42570	2	67.66574
3	7.01041	3	22.25044	3	37.49047	3	52.73051	3	67.97054
4	7.31521	4	22.55525	4	37.79528	4	53.03531	4	68.27534
5	7.62002	**5**	22.86005	**5**	38.10008	**5**	53.34011	**5**	68.58014
6	7.92482	6	23.16485	6	38.40488	6	53.64491	6	68.88494
7	8.22962	7	23.46965	7	38.70968	7	53.94971	7	69.18974
8	8.53442	8	23.77445	8	39.01448	8	54.25451	8	69.49454
9	8.83922	9	24.07925	9	39.31928	9	54.55931	9	69.79934
30	9.14402	**80**	24.38405	**130**	39.62408	**180**	54.86411	**230**	70.10414
1	9.44882	1	24.68885	1	39.92888	1	55.16891	1	70.40894
2	9.75362	2	24.99365	2	40.23368	2	55.47371	2	70.71374
3	10.05842	3	25.29845	3	40.53848	3	55.77851	3	71.01854
4	10.36322	4	25.60325	4	40.84328	4	56.08331	4	71.32334
5	10.66802	**5**	25.90805	**5**	41.14808	**5**	56.38811	**5**	71.62814
6	10.97282	6	26.21285	6	41.45288	6	56.69291	6	71.93294
7	11.27762	7	26.51765	7	41.75768	7	56.99771	7	72.23774
8	11.58242	8	26.82245	8	42.06248	8	57.30251	8	72.54255
9	11.88722	9	27.12725	9	42.36728	9	57.60732	9	72.84735
40	12.19202	**90**	27.43205	**140**	42.67209	**190**	57.91212	**240**	73.15215
1	12.49682	1	27.73686	1	42.97689	1	58.21692	1	73.45695
2	12.80163	2	28.04166	2	43.28169	2	58.52172	2	73.76175
3	13.10643	3	28.34646	3	43.58649	3	58.82652	3	74.06655
4	13.41123	4	28.65126	4	43.89129	4	59.13132	4	74.37135
5	13.71603	**5**	28.95606	**5**	44.19609	**5**	59.43612	**5**	74.67615
6	14.02083	6	29.26086	6	44.50089	6	59.74092	6	74.98095
7	14.32563	7	29.56566	7	44.80569	7	60.04572	7	75.28575
8	14.63043	8	29.87046	8	45.11049	8	60.35052	8	75.59055
9	14.93523	9	30.17526	9	45.41529	9	60.65532	9	75.89535

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TABLE X.—*Conversion of feet to meters*—Continued

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
250	76.20015	300	91.44018	350	106.68021	400	121.92024	450	137.16027
1	76.50495	1	91.74498	1	106.98501	1	122.22504	1	137.46507
2	76.80975	2	92.04978	2	107.28981	2	122.52985	2	137.76988
3	77.11455	3	92.35458	3	107.59462	3	122.83465	3	138.07468
4	77.41935	4	92.65939	4	107.89942	4	123.13945	4	138.37948
5	77.72416	5	92.96419	5	108.20422	5	123.44425	5	138.68428
6	78.02896	6	93.26899	6	108.50902	6	123.74905	6	138.98908
7	78.33376	7	93.57379	7	108.81382	7	124.05385	7	139.29388
8	78.63856	8	93.87859	8	109.11862	8	124.35865	8	139.59868
9	78.94336	9	94.18339	9	109.42342	9	124.66345	9	139.90348
260	79.24816	310	94.48819	360	109.72822	410	124.96825	460	140.20828
1	79.55296	1	94.79299	1	110.03302	1	125.27305	1	140.51308
2	79.85776	2	95.09779	2	110.33782	2	125.57785	2	140.81788
3	80.16256	3	95.40259	3	110.64262	3	125.88265	3	141.12268
4	80.46736	4	95.70739	4	110.94742	4	126.18745	4	141.42748
5	80.77216	5	96.01219	5	111.25222	5	126.49225	5	141.73228
6	81.07696	6	96.31699	6	111.55702	6	126.79705	6	142.03708
7	81.38176	7	96.62179	7	111.86182	7	127.10185	7	142.34188
8	81.68656	8	96.92659	8	112.16662	8	127.40665	8	142.64669
9	81.99136	9	97.23139	9	112.47142	9	127.71146	9	142.95149
270	82.29616	320	97.53620	370	112.77623	420	128.01626	470	143.25629
1	82.60097	1	97.84100	1	113.08103	1	128.32106	1	143.56109
2	82.90577	2	98.14580	2	113.38583	2	128.62586	2	143.86589
3	83.21057	3	98.45060	3	113.69063	3	128.93066	3	144.17069
4	83.51537	4	98.75540	4	113.99543	4	129.23546	4	144.47549
5	83.82017	5	99.06020	5	114.30023	5	129.54026	5	144.78029
6	84.12497	6	99.36500	6	114.60503	6	129.84506	6	145.08509
7	84.42977	7	99.66980	7	114.90983	7	130.14986	7	145.38989
8	84.73457	8	99.97460	8	115.21463	8	130.45466	8	145.69469
9	85.03937	9	100.27940	9	115.51943	9	130.75946	9	145.99949
280	85.34417	330	100.58420	380	115.82423	430	131.06426	480	146.30429
1	85.64897	1	100.88900	1	116.12903	1	131.36906	1	146.60909
2	85.95377	2	101.19380	2	116.43383	2	131.67386	2	146.91389
3	86.25857	3	101.49860	3	116.73863	3	131.97866	3	147.21869
4	86.56337	4	101.80340	4	117.04343	4	132.28346	4	147.52350
5	86.86817	5	102.10820	5	117.34823	5	132.58827	5	147.82830
6	87.17297	6	102.41300	6	117.65304	6	132.89307	6	148.13310
7	87.47777	7	102.71781	7	117.95784	7	133.19787	7	148.43790
8	87.78258	8	103.02261	8	118.26264	8	133.50267	8	148.74270
9	88.08738	9	103.32741	9	118.56744	9	133.80747	9	149.04750
290	88.39218	340	103.63221	390	118.87224	440	134.11227	490	149.35230
1	88.69698	1	103.93701	1	119.17704	1	134.41707	1	149.65710
2	89.00178	2	104.24181	2	119.48184	2	134.72187	2	149.96190
3	89.30658	3	104.54661	3	119.78664	3	135.02667	3	150.26670
4	89.61138	4	104.85141	4	120.09144	4	135.33147	4	150.57150
5	89.91618	5	105.15621	5	120.39624	5	135.63627	5	150.87630
6	90.22098	6	105.46101	6	120.70104	6	135.94107	6	151.18110
7	90.52578	7	105.76581	7	121.00584	7	136.24587	7	151.48590
8	90.83058	8	106.07061	8	121.31064	8	136.55067	8	151.79070
9	91.13538	9	106.37541	9	121.61544	9	136.85547	9	152.09550

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TABLE X.—*Conversion of feet to meters*—Continued

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
500	152.40030	**550**	167.64034	**600**	182.88037	**650**	198.12040	**700**	213.36043
1	152.70511	1	167.94514	1	183.18517	1	198.42520	1	213,66523
2	153.00991	2	168.24994	2	183.48997	2	198.73000	2	213.97003
3	153.31471	3	168 55474	3	183 79477	3	199.03480	3	214.27483
4	153.61951	4	168.85954	4	184.09957	4	199.33960	4	214.57963
5	153.92431	5	169.16434	5	184.40437	5	199.64440	5	214.88443
6	154.22911	6	169.46914	6	184.70917	6	199.94920	6	215.18923
7	154.53391	7	169.77394	7	185.01397	7	200.25400	7	215.49403
8	154.83871	8	170.07874	8	185.31877	8	200.55880	8	215.79883
9	155.14351	9	170.38354	9	185.62357	9	200.86360	9	216.10363
510	155.44831	**560**	170.68834	**610**	185.92837	**660**	201.16840	**710**	216.40843
1	155.75311	1	170.99314	1	186.23317	1	201.47320	1	216.71323
2	156.05791	2	171.29794	2	186.53797	2	201.77800	2	217.01803
3	156.36271	3	171.60274	3	186.84277	3	202.08280	3	217.32283
4	156.66751	4	171.90754	4	187.14757	4	202.38760	4	217.62764
5	156.97231	5	172.21234	5	187.45237	5	202.69241	5	217.93244
6	157.27711	6	172.51715	6	187.75718	6	202.99721	6	218.23724
7	157.58192	7	172.82195	7	188.06198	7	203.30201	7	218.54204
8	157.88672	8	173.12675	8	188.36678	8	203.60681	8	218.84684
9	158.19152	9	173.43155	9	188.67158	9	203.91161	9	219.15164
520	158.49632	**570**	173.73635	**620**	188.97638	**670**	204.21641	**720**	219.45644
1	158.80112	1	174.04115	1	189.28118	1	204.52121	1	219.76124
2	159.10592	2	174.34595	2	189.58598	2	204.82601	2	220.06604
3	159.41072	3	174.65075	3	189.89078	3	205.13081	3	220.37084
4	159.71552	4	174.95555	4	190.19558	4	205.43561	4	220.67564
5	160.02032	5	175.26035	5	190.50038	5	205.74041	5	220.98044
6	160.32512	6	175.56515	6	190.80518	6	206 04521	6	221.28524
7	160.62992	7	175.86995	7	191.10998	7	206 35001	7	221.59004
8	160.93472	8	176.17475	8	191.41478	8	206.65481	8	221.89484
9	161.23952	9	176.47955	9	191.71958	9	206.95961	9	222.19964
530	161.54432	**580**	176.78435	**630**	192.02438	**680**	207.26441	**730**	222.50445
1	161.84912	1	177.08915	1	192.32918	1	207.56922	1	222.80925
2	162.15392	2	177.39395	2	192.63399	2	207.87402	2	223.11405
3	162.45872	3	177.69876	3	192.93879	3	208.17882	3	223.41885
4	162.76353	4	178.00356	4	193.24359	4	208.48362	4	223.72365
5	163.06833	5	178.30836	5	193.54839	5	208.78842	5	224.02845
6	163.37313	6	178.61316	6	193.85319	6	209.09322	6	224.33325
7	163.67793	7	178.91796	7	194.15799	7	209.39802	7	224.63805
8	163.98273	8	179.22276	8	194.46279	8	209.70282	8	224.94285
9	164.28753	9	179.52756	9	194.76759	9	210.00762	9	225.24765
540	164.59233	**590**	179.83236	**640**	195.07239	**690**	210.31242	**740**	225.55245
1	164.89713	1	180.13716	1	195.37719	1	210.61722	1	225.85725
2	165.20193	2	180.44196	2	195.68199	2	210.92202	2	226.16205
3	165.50673	3	180.74676	3	195.98679	3	211.22682	3	226.46685
4	165.81153	4	181.05156	4	196.29159	4	211.53162	4	226.77165
5	166.11633	5	181.35636	5	196.59639	5	211.83642	5	227.07645
6	166.42113	6	181.66116	6	196.90119	6	212.14122	6	227.38125
7	166.72593	7	181.96596	7	197.20599	7	212.44602	7	227.68606
8	167.03073	8	182.27076	8	197.51080	8	212.75083	8	227.99086
9	167 33553	9	182.57557	9	197.81560	9	213.05563	9	228.29566

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TABLE X.—*Conversion of feet to meters*—Continued

Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
750	228.60046	800	243.84049	850	259.08052	900	274.32055	950	289.56058
1	228.90526	1	244.14529	1	259.38532	1	274.62535	1	289.86538
2	229.21006	2	244.45009	2	259.69012	2	274.93015	2	290.17018
3	229.51486	3	244.75489	3	259.99492	3	275.23495	3	290.47498
4	229.81966	4	245.05969	4	260.29972	4	275.53975	4	290.77978
5	230.12446	5	245.36449	5	260.60452	5	275.84455	5	291.08458
6	230.42926	6	245.66929	6	260.90932	6	276.14935	6	291.38938
7	230.73406	7	245.97409	7	261.21412	7	276.45415	7	291.69418
8	231.03886	8	246.27889	8	261.51892	8	276.75895	8	291.99898
9	231.34366	9	246.58369	9	261.82372	9	277.06375	9	292.30378
760	231.64846	810	246.88849	860	262.12852	910	277.36855	960	292.60859
1	231.95326	1	247.19329	1	262.43332	1	277.67336	1	292.91339
2	232.25806	2	247.49809	2	262.73813	2	277.97816	2	293.21819
3	232.56287	3	247.80290	3	263.04293	3	278.28296	3	293.52299
4	232.86767	4	248.10770	4	263.34773	4	278.58776	4	293.82779
5	233.17247	5	248.41250	5	263.65253	5	278.89256	5	294.13259
6	233.47727	6	248.71730	6	263.95733	6	279.19736	6	294.43739
7	233.78207	7	249.02210	7	264.26213	7	279.50216	7	294.74219
8	234.08687	8	249.32690	8	264.56693	8	279.80696	8	295.04699
9	234.39167	9	249.63170	9	264.87173	9	280.11176	9	295.35179
770	234.69647	820	249.93650	870	265.17653	920	280.41656	970	295.65659
1	235.00127	1	250.24130	1	265.48133	1	280.72136	1	295.96139
2	235.30607	2	250.54610	2	265.78613	2	281.02616	2	296.26619
3	235.61087	3	250.85090	3	266.09093	3	281.33096	3	296.57099
4	235.91567	4	251.15570	4	266.39573	4	281.63576	4	296.87579
5	236.22047	5	251.46050	5	266.70053	5	281.94056	5	297.18059
6	236.52527	6	251.76530	6	267.00533	6	282.24536	6	297.48539
7	236.83007	7	252.07010	7	267.31013	7	282.55017	7	297.79020
8	237.13487	8	252.37490	8	267.61494	8	282.85497	8	298.09500
9	237.43967	9	252.67971	9	267.91974	9	283.15977	9	298.39980
780	237.74448	830	252.98451	880	268.22454	930	283.46457	980	298.70460
1	238.04928	1	253.28931	1	268.52934	1	283.76937	1	299.00940
2	238.35408	2	253.59411	2	268.83414	2	284.07417	2	299.31420
3	238.65888	3	253.89891	3	269.13894	3	284.37897	3	299.61900
4	238.96368	4	254.20371	4	269.44374	4	284.68377	4	299.92380
5	239.26848	5	254.50851	5	269.74854	5	284.98857	5	300.22860
6	239.57328	6	254.81331	6	270.05334	6	285.29337	6	300.53340
7	239.87808	7	255.11811	7	270.35814	7	285.59817	7	300.83820
8	240.18288	8	255.42291	8	270.66294	8	285.90297	8	301.14300
9	240.48768	9	255.72771	9	270.96774	9	286.20777	9	301.44780
790	240.79248	840	256.03251	890	271.27254	940	286.51257	990	301.75260
1	241.09728	1	256.33731	1	271.57734	1	286.81737	1	302.05740
2	241.40208	2	256.64211	2	271.88214	2	287.12217	2	302.36220
3	241.70688	3	256.94691	3	272.18694	3	287.42697	3	302.66701
4	242.01168	4	257.25171	4	272.49174	4	287.73178	4	302.97181
5	242.31648	5	257.55652	5	272.79655	5	288.03658	5	303.27661
6	242.62129	6	257.86132	6	273.10135	6	288.34138	6	303.58141
7	242.92609	7	258.16612	7	273.40615	7	288.64618	7	303.88621
8	243.23089	8	258.47092	8	273.71095	8	288.95098	8	304.19101
9	243.53569	9	258.77572	9	274.01575	9	289.25578	9	304.49581

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TABLE XI

CONVERSION OF SECONDS OF LATITUDE AND LONGITUDE TO FEET

	Minutes of latitude	Latitude of arc (values in feet for single seconds)														
		0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°
For arcs of parallel	0	101.45	101.44	101.39	101.31	101.21	101.07	100.90	100.70	100.47	100.21	99.92	99.60	99.25	98.87	98.46
	5	.45	.43	.38	.30	.20	.06	.89	.68	.45	.19	.90	.57	.22	.83	.42
	10	.45	.43	.38	.30	.19	.04	.87	.66	.42	.16	.87	.54	.19	.80	.39
	15	.45	.43	.38	.29	.17	.03	.85	.65	.41	.14	.84	.51	.16	.77	.35
	20	.45	.42	.37	.28	.16	.01	.84	.63	.39	.12	.82	.49	.13	.73	.31
	25	.45	.42	.37	.27	.15	101.00	.82	.61	.37	.09	.79	.46	.09	.70	.27
	30	.45	.42	.36	.27	.14	100.98	.80	.59	.35	.07	.76	.43	.06	.67	.24
	35	.44	.41	.35	.26	.13	.97	.79	.57	.32	.04	.73	.40	.03	.63	.20
	40	.44	.41	.34	.25	.12	.96	.77	.55	.30	.02	.71	.37	99.00	.60	.17
	45	.44	.40	.34	.24	.11	.95	.75	.53	.27	100.00	.68	.34	98.97	.56	.13
	50	.44	.40	.33	.23	.09	.93	.74	.51	.26	99.97	.65	.31	.94	.53	.09
	55	.44	.40	.32	.22	.09	.92	.72	.49	.23	.95	.62	.28	.90	.49	.05
	60	101.44	101.39	101.31	101.21	101.07	100.90	100.70	100.47	100.21	99.92	99.60	99.25	98.87	98.46	98.02
Meridional arcs	Mean value of 1″ of latitude..	100.76	100.76	100.77	100.77	100.77	100.77	100.77	100.78	100.78	100.79	100.80	100.81	100.82	100.82	100.83
		15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°
For arcs of parallel	0	98.02	97.55	97.05	96.52	95.96	95.37	94.76	94.11	93.43	92.75	92.00	91.25	90.46	89.64	88.80
	5	97.98	.51	97.00	.47	.91	.32	.70	.05	.38	.67	91.94	.18	.39	.57	.73
	10	.94	.47	96.96	.42	.87	.27	.65	94.00	.32	.61	.88	.11	.32	.51	.66
	15	.90	.42	.92	.38	.82	.22	.59	93.94	.26	.55	.82	91.05	.26	.44	.59
	20	.86	.38	.88	.33	.77	.17	.54	.88	.20	.49	.78	90.98	.19	.36	.52
	25	.82	.34	.83	.29	.72	.12	.49	.83	.15	.43	.69	.92	.12	.29	.44
	30	.79	.30	.78	.24	.67	.07	.44	.77	09	.37	.63	.85	90.05	.23	.37
	35	.75	.26	.74	.19	.62	95.01	.38	.71	93.03	.31	.57	.79	89.98	.15	.30
	40	.71	.22	.70	.15	.57	94.96	.32	.66	92.98	.25	.50	.72	.91	.09	.23
	45	.66	.17	.65	.10	.52	.91	.27	.61	.91	.19	.44	.65	.85	89.02	.16
	50	.62	.13	.61	.06	.47	.86	.22	.55	.85	.13	.37	.59	.78	88.94	.08
	55	.58	.09	.56	.01	.43	.81	.16	.49	.80	.07	.31	.52	.71	.87	88.01
	60	97.55	97.05	96.52	95.96	95.37	94.76	94.11	93.43	92.75	92.00	91.25	90.46	89.64	88.80	87.93
Meridional arcs	Mean value of 1″ of latitude..	100.83	100.85	100.86	100.87	100.88	100.89	100.90	100.92	100.93	100.94	100.95	100.97	100.98	101.00	101.01

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TABLE XI.—*Conversion of seconds of latitude and longitude to feet*—Continued

	Minutes of latitude	Latitude of arc (values in feet for single seconds)														
		30°	31°	32°	33°	34°	35°	36°	37°	38°	39°	40°	41°	42°	43°	44°
For arcs of parallel	0	87.93	87.04	86.12	85.17	84.20	83.20	82.17	81.12	80.05	78.95	77.83	76.68	75.51	74.31	73.10
	5	.86	86.96	86.04	.09	.11	.11	.09	81.03	79.96	.86	.73	.58	.41	.21	73.00
	10	.79	.89	85.96	85.01	84.03	83.02	82.00	80.94	.87	.76	.64	.48	.31	.11	72.89
	15	.72	.81	.89	84.93	83.95	82.95	81.91	.85	.78	.67	.55	.39	.21	74.01	.79
	20	.64	73	.81	.85	.86	.86	.82	.77	.68	.58	.45	.29	.11	73.91	.69
	25	.57	.65	.73	.77	.78	.77	.74	.68	.59	.48	.35	.19	75.01	.81	.59
	30	.49	.58	.65	.68	.70	.69	.65	.59	.50	.39	.25	.10	74.91	.71	.48
	35	.41	.51	.57	.60	.61	.60	.56	.50	.41	.30	.15	76.00	.81	.61	.38
	40	.34	.43	.49	.52	.53	.51	.48	.41	.32	.20	77.06	75.90	.71	.51	.28
	45	.27	.35	.41	.44	.44	.43	.39	.32	.23	.10	76.97	.80	.61	.41	.17
	50	.19	.27	.33	.36	.37	.34	.30	.23	.13	78.01	.87	.70	.51	.31	72.07
	55	.11	.19	.25	.28	.28	.26	.21	.14	79.04	77.92	.77	.60	.41	.21	71.97
	60	87.04	86.12	85.17	84.20	83.20	82.17	81.12	80.05	78.95	77.83	76.68	75.51	74.31	73.10	71.86
Meridional arcs	Mean value of 1″ of latitude	101.03	101.04	101.05	101.08	101.09	101.11	101.13	101.14	101.16	101.18	101.20	101.22	101.23	101.25	101.27

		45°	46°	47°	48°	49°	50°	51°	52°	53°	54°	55°	56°	57°	58°	59°
For arcs of parallel	0	71.86	70.60	69.32	68.01	66.69	65.34	63.98	62.59	61.19	59.76	58.32	56.86	55.39	53.89	52.38
	5	.75	.49	.21	67.90	.57	.23	.86	.48	61.07	.65	.20	.74	.26	.77	.25
	10	.65	.39	.11	.79	.46	.12	.75	.36	60.95	.53	58.08	.62	.14	.64	.13
	15	.55	.28	69.00	.68	.35	65.01	.63	.24	.83	.41	57.96	.50	55.01	.52	52.00
	20	.44	.17	68.89	.57	.24	64.89	.52	.13	.72	.29	.84	.37	54.89	.39	51.88
	25	.34	70.06	.78	.46	.13	.78	.41	62.01	.60	.17	.72	.25	.76	.27	.75
	30	.23	69.96	.67	.35	66.02	.66	.29	61.89	.48	59.05	.60	.13	.64	.14	.62
	35	.13	.86	.56	.24	65.90	.55	.18	.78	.36	58.93	.47	56.01	.51	53.01	.50
	40	71.02	.75	.45	.13	.79	.44	63.06	.66	.24	.81	.35	55.88	.39	52.89	.37
	45	70.91	.64	.34	67.02	.68	.32	62.94	.54	.12	.68	.23	.76	.26	.76	.24
	50	.80	.53	.23	66.91	.56	.21	.82	.42	60.00	.56	57.11	.64	.14	.64	51.11
	55	.70	.42	.12	.80	.45	64.09	.70	.30	59.88	.44	56.99	.51	54.02	.51	50.98
	60	70.60	69.32	68.01	66.69	65.34	63.98	62.59	61.19	59.76	58.32	56.86	55.39	53.89	52.38	50.85
Meridional arcs	Mean value of 1″ of latitude	101.29	101.31	101.32	101.34	101.36	101.38	101.39	101.41	101.43	101.45	101.46	101.48	101.50	101.51	101.53

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TABLE XI.—*Conversion of seconds of latitude and longitude to feet*—Continued

		60°	61°	62°	63°	64°	65°	66°	67°	68°	69°	70°	71°	72°	73°	74°
For arcs of parallel	0	50.85	49.31	47.76	46.18	44.59	42.99	41.38	39.76	38.12	36.46	34.80	33.13	31.45	29.76	28.05
	5	.73	.18	.63	46.05	.46	.86	.25	.62	37.98	.33	.66	32.99	.31	.61	27.91
	10	.60	49.05	.49	45.92	.33	.73	41.11	.48	.84	.19	.52	.85	.17	.47	.77
	15	.47	48.92	.36	.79	.19	.59	40.98	.34	.70	36.05	.38	.71	31.03	.33	.52
	20	.34	.79	.23	.66	44.06	.46	.84	.21	.57	35.91	.24	.57	30.89	.19	.48
	25	.22	.66	.10	.52	43.93	.32	.70	39.07	.43	.77	34.11	.43	.74	29.04	.34
	30	50.09	.54	46.97	.39	.80	.19	.57	38.94	.29	.64	33.97	.29	.60	28.90	.20
	35	49.96	.41	.84	.26	.66	42.05	.44	.80	.15	.50	.83	.15	.46	.76	27.05
	40	.83	.28	.71	45.13	.53	41.92	.30	.66	37.01	.36	.69	32.01	.32	.62	26.91
	45	.71	.15	.57	44.99	.40	.78	.16	.52	36.88	.22	.55	31.87	.18	.48	.77
	50	.57	48.02	.44	.86	.26	.65	40.03	.39	.74	35.06	.41	.73	30.04	.33	.63
	55	.44	47.89	.31	.72	43.13	.52	39.89	.25	.60	34.94	.27	.59	29.90	.19	.48
	60	49.31	47.76	46.18	44.59	42.99	41.38	39.76	38.12	36.46	34.80	33.13	31.45	29.76	28.05	26.34
Meridional arcs	Mean value of 1″ of latitude	101.55	101.56	101.57	101.59	101.60	101.62	101.63	101.64	101.66	101.67	101.68	101.69	101.70	101.71	101.72

		75°	76°	77°	78°	79°	80°	81°	82°	83°	84°	85°	86°	87°	88°	89°	
For arcs of parallel	0	26.34	24.62	22.89	21.16	19.42	17.68	15.92	14.17	12.41	10.64	8.87	7.10	5.33	3.55	1.78	
	5	.20	.48	.75	21.02	.28	.53	.77	14.02	.26	.49	.73	6.95	.18	.40	.63	
	10	26.06	.34	.60	20.87	.13	.38	.63	13.87	12.11	.35	.58	.80	5.03	.25	.48	
	15	25.91	.19	.46	.73	18.98	.24	.49	.73	11.96	.20	.43	.66	4.88	3.11	.33	
	20	.77	24.05	.32	.58	.84	17.09	.34	.58	.82	10.05	.28	.51	.74	2.96	.19	
	25	.62	23.90	.17	.44	.69	16.95	.19	.43	.67	9.90	8.14	.36	.58	.81	1.04	
	30	.48	.76	22.03	.30	.55	.90	15.05	.29	.52	.76	7.99	.21	.44	.66	0.89	
	35	.34	.62	21.88	.15	.40	.65	14.90	13.14	.38	.61	.84	6.07	.29	.52	.74	
	40	.20	.47	.74	20.00	.26	.51	.75	12.99	.23	.46	.69	5.92	.15	.37	.59	
	45	25.05	.33	.59	19.85	18.11	.36	.61	.85	11.08	.32	.55	.77	4.00	.22	.45	
	50	24.91	.18	.45	.71	17.97	.21	.46	.70	10.94	.17	.40	.62	3.85	2.07	.30	
	55	.76	23.04	.31	.57	.82	16.07	.31	.55	.79	9.02	.25	.48	.70	1.92	.15	
	60	24.62	22.89	21.16	19.42	17.68	15.92	14.17	12.41	10.64	8.87	7.10	5.33	3.55	1.78	0.00	
Meridional arcs	Mean value of 1″ of latitude	101.73	101.73	101.74	101.75	101.76	101.76	101.77	101.77	101.78	101.79	101.79	101.79	101.79	101.79	----------	

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TABLE XII

TABLES OF S

(For conversion of log seconds to log sine)

(The underlined figures at the top of each column are common to all values, e. g., the first value of S in the table is 4.6855749)

S	Log seconds	Difference	S	Log seconds	Difference
4.685		.00	4.685		.00
5749	1. 9912360		5550	3. 5337450	.0113008
5748	2. 4166405		5540	3. 5443161	.0105711
5747	2. 4526682		5530	3. 5544892	.0101731
5746	2. 6344772		5520	3. 5641925	.0097033
5745	2. 6937269		5510	3. 5735098	.0093173
5744	2. 7411515		5500	3. 5824043	.0088945
5743	2. 7788744		5490	3. 5909532	.0085489
5742	2. 8122446		5480	3. 5992279	.0082747
5741	2. 8407332		5470	3. 6071332	.0079053
5740	2. 8656960		5460	3. 6147918	.0076586
5739	2. 8881794		5450	3. 6222140	.0074222
5738	2. 9084850		5440	3. 6293586	.0071446
5737	2. 9268567		5430	3. 6362873	.0069287
5736	2. 9444826		5420	3. 6429589	.0066716
5735	2. 9599948		5410	3. 6494809	.0065220
5734	2. 9749720		5400	3. 6558105	.0063296
5733	2. 9890046		5390	3. 6619546	.0061441
5732	3. 0021660		5380	3. 6679197	59651
5731	3. 0141003		5370	3. 6737579	58382
5730	3. 0257153		5360	3. 6793823	56244
5729	3. 0370278		5350	3. 6849351	55528
5728	3. 0472748		5340	3. 6902847	53496
5727	3. 0572856		5330	3. 6955255	52408
5726	3. 0670708		5320	3. 7006605	51350
5725	3. 0762762		5310	3. 7056927	50322
5724	3. 0849335		5300	3. 7105827	48900
5723	3. 0934216		5290	2. 7153347	47520
5722	3. 1014033		5280	3. 7200352	47005
5721	3. 1092409		5270	3. 7246035	45683
5720	3. 1169396		5260	3. 7291243	45208
5719	3. 1241780		5250	3. 7335183	43940
5718	3. 1312978		5240	3. 7378285	43102
5717	3. 1383027		5230	3. 7420571	42286
5716	3. 1448754		5220	3. 7462059	41488
5715	3. 1513698		5210	3. 7502769	40710
5714	3. 1574567		5200	3. 7542719	39950
5713	3. 1637575		5190	3. 7581925	39206
5712	3. 1696744		5180	3. 7620405	38480
5711	3. 1752218		5170	3. 7658175	37770
5710	3. 1809855		5160	3. 7695250	37075
5709	3. 1863912		5150	3. 7732011	36761
5708	3. 1917304		5140	3. 7768101	36090
5707	3. 1945143		5130	3. 7803173	35072
5706	3. 1996230		5120	3. 7837964	34791
5705	3. 2047980		5110	3. 7872479	34515
5704	3. 2096490		5100	3. 7906018	33539
5703	3. 2144464		5090	3. 7939300	33282
5702	3. 2191914		5080	3. 7971983	32683
5701	3. 2236257		5070	3. 8004421	32438
5700	3. 2282720		5060	3. 8035937	31516
5699	3. 2326150		5050	3. 8067225	31288
5698	3. 2369149		5040	3. 8098290	31065
5697	3. 2411728		5030	3. 8128849	30559
5696	3. 2453893		5020	3. 8158765	29916
5695	3. 2504430		5010	3. 8188195	29430
5694	3. 2534592		5000	3. 8217427	29232
5693	3. 2574386		4990	3. 8246139	28712
5692	3. 2612629		4980	3. 8274662	28523
5691	3. 2650538		4970	3. 8302678	28016
5690	3. 2688119	0. 0341680	4960	3. 8330514	27836
5680	3. 3029799	.0294586	4950	3. 8351857	27343
5670	3. 3324385	.0260674	4940	3. 8384113	26856
5660	3. 3585059	.0231506	4930	3. 8411717	27604
5650	3. 3816565	.0209487	4920	3. 8437932	26215
5640	3. 4026052	.0191632	4910	3. 8463990	26058
5630	3. 4217684	.0175643	4900	3. 8489687	25697
5620	3. 4393327	.0162734	4890	3. 8515233	25546
5610	3. 4556061	.0150983	4880	3. 8540326	25093
5600	3. 4707044	.0141646	4870	3, 8565174	24848
5590	3. 4848690	.0133037	4860	3, 8589581	24407
5580	3. 4981727	.0125063	4850	3, 8613850	24269
5570	3. 5106790	.0117652	4840	3, 8637985	24135
5560	3. 5224442				

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TABLE XII.—*Tables of S*—Continued

S	Log seconds	Difference	S	Log seconds	Difference
4.685		.00	4.685		.00
		23707			12658
4830	3, 8661692	23577	4030	4. 0021876	12585
4820	3, 8685269	23158	4020	4. 0034461	12513
4810	3. 8708427	23035	4010	4. 0046974	12442
4800	3, 8731462	22913	4000	4. 0059416	12406
4790	3. 8754375	22505	3990	4. 0071822	12334
4780	3, 8776880	22390	3980	4. 0084156	12304
4770	3. 8799270	21989	3970	4. 0096350	12160
4760	3, 8821259	21879	3960	4. 0108510	12160
4750	3, 8843138	21487	3950	4. 0120670	12021
4740	3, 8864625	21382	3940	4. 0132691	11989
4730	3, 8886007	21276	3930	4. 0144680	11851
4720	3, 8907283	21173	3920	4. 0156531	11853
4710	3. 8928456	20794	3910	4. 0168384	11823
4700	3. 8949250	20694	3900	4. 0180207	11683
4690	3. 8969944	20323	3890	4. 0191890	11723
4680	3, 8990267	20227	3880	4. 0203613	11588
4670	3, 9010494	19863	3870	4. 0215201	11453
4660	3, 9030357	20042	3860	4. 0226654	11469
4650	3. 9050399	19681	3850	4. 0238147	11428
4640	3. 9070080	19325	3840	4. 0249575	11364
4630	3. 9089405	19239	3830	4. 0260939	11232
4620	3. 9108644	19155	3820	4. 0272171	11237
4610	3. 9127799	19070	3810	4. 0283408	11140
4600	3. 9146869	18986	3800	4. 0294548	11146
4590	3. 9165855	18642	3790	4. 0305694	11083
4580	3. 9184497	18563	3780	4. 0316777	11022
4570	3. 9203060	18223	3770	4. 0327799	10860
4560	3. 9221283	18148	3760	4. 0338659	10943
4550	3. 9239431	18072	3750	4. 0349602	10795
4540	3. 9257503	18253	3740	4. 0360397	10812
4530	3. 9275756	17411	3730	4. 0371209	10711
4520	3. 9293167	17596	3720	4. 0381928	10726
4510	3. 9310763	17271	3710	4. 0392654	10600
4500	3. 9328034	17456	3700	4. 0403254	10574
4490	3. 9345490	17134	3690	4. 0413828	10483
4480	3. 9362624	17066	3680	4. 0424311	10491
4470	3. 9379690	17000	3670	4. 0434802	10400
4460	3. 9396690	16685	3660	4. 0445202	10375
4450	3. 9413375	16868	3650	4. 0455577	10350
4440	3. 9430243	16311	3640	4. 0465927	10229
4430	3. 9446554	16525	3630	4. 0476156	10301
4420	3. 9463079	16157	3620	4. 0486487	10116
4410	3. 9479236	16290	3610	4. 0496573	10124
4400	3. 9495526	16068	3600	4. 0506697	10133
4390	3. 9511594	15846	3590	4. 0516830	10013
4380	3. 9527440	16191	3580	4. 0526843	09991
4370	3. 9543631	15410	3570	4. 0536834	09967
4360	3. 9559041	15256	3560	4. 0546801	09848
4350	3. 9574297	15640	3550	4. 0556649	09859
4340	3. 9589937	15484	3540	4. 0566508	09773
4330	3. 9605421	15193	3530	4. 0576281	09782
4320	3. 9620614	15140	3520	4. 0586063	09761
4310	3. 9635754	15087	3510	4. 0595824	09644
4300	3. 9650841	15034	3500	4. 0605468	09622
4290	3. 9665875	14750	3490	4. 0615090	09602
4280	3. 9680625	14699	3480	4. 0624692	09580
4270	3. 9695324	14620	3570	4. 0634272	09465
4260	3. 9709974	14600	3460	4. 0643737	09538
4250	3. 9724574	14321	3450	4. 0653275	09425
4240	3. 9738895	14274	3440	4. 0662700	09311
4230	3. 9753169	14237	3430	4. 0672011	09384
4220	3. 9767406	14182	3420	4. 0681395	09271
4210	3. 9781588	14132	3410	4. 0690666	09251
4200	3. 9795720	14090	3400	4. 0699917	09231
4190	3. 9809810	13807	3390	4. 0709148	09212
4180	3. 9823617	13783	3380	4. 0718360	09192
4170	3. 9837400	13720	3370	4. 0727552	09182
4160	3. 9851120	13680	3360	4. 0736634	09062
4150	3. 9864806	13420	3350	4. 0745696	09044
4140	3. 9878226	13379	3340	4. 0754740	09024
4130	3. 9891605	13338	3330	4. 0763764	08915
4120	3. 9904943	13296	3320	4. 0772679	08897
4110	3. 9918239	13330	3310	4. 0781576	08879
4100	3. 9931569	13142	3300	4. 0790455	08860
4090	3. 9944711	13066	3290	4. 0799315	08843
4080	3. 9957777	13027	3280	4. 0808158	08735
4070	3. 9970804	12807	3270	4. 0816893	08807
4060	3. 9983611	12804	3260	4. 0825700	08699
4050	3. 9996415	12803	3250	4. 0834399	08683
4040	4. 0009218		3240	4. 0843082	

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TABLE XII.—*Tables of S*—Continued

S	Log seconds	Difference	S	Log seconds	Difference
4.685		.000	4.685		.000
		8576			6536
3230	4. 0851658	8646	2430	4. 1450565	6526
3220	4. 0860304	8561	2420	4. 1457091	6515
3210	4. 0868845	8526	2410	4. 1463606	6506
3200	4. 0877371	8508	2400	4. 1470112	6497
3190	4. 0885879	8491	2390	4. 1476609	6486
3180	4. 0894370	8387	2380	4. 1483095	6400
3170	4. 0902757.	8458	2370	4. 1489495	6391
3160	4. 0911215	8355	2360	4. 1495886	6380
3150	4. 0919570	8338	2350	4. 1502266	6372
3140	4. 0927908	8322	2340	4. 1508638	6439
3130	4. 0936230	8307	2330	4. 1515077	6277
3120	4. 0944537	8203	2320	4. 1521354	6359
3110	4. 0952740	8188	2310	4. 1527713	6291
3100	4. 0960928	8172	2300	4. 1534002	6280
3090	4. 0969100	8157	2290	4. 1540282	6270
3080	4. 0977257	8142	2280	4. 1546552	6262
3070	4. 0985399	8127	2270	4. 1552814	6239
3060	4. 0993526	8025	2260	4. 1559053	6196
3050	4. 1001551	8010	2250	4. 1565249	6295
3040	4. 1009561	8081	2240	4. 1571544	5890
3030	4. 1017642	7996	2230	4. 1577434	6372
3020	4. 1025538	7966	2220	4. 1583806	6148
3010	4. 1033504	7952	2210	4. 1589954	6079
3000	4. 1041456	7851	2200	4. 1596033	6131
2990	4. 1049307	7838	2190	4. 1602164	6101
2980	4. 1057145	7824	2180	4. 1608285	6054
2970	4. 1064969	7809	2170	4. 1614339	6145
2960	4. 1072778	7796	2160	4. 1620484	5937
2950	4. 1080574	7697	2150	4. 1626421	6028
2940	4. 1088271	7758	2140	4. 1632449	6020
2930	4. 1096029	7679	2130	4. 1638469	6011
2920	4. 1103708	7656	2120	4. 1644480	5944
2910	4. 1111364	7643	2110	4. 1650424	5995
2900	4. 1119007	7679	2100	4. 1656419	5928
2890	4. 1126686	7547	2090	4. 1662347	5919
2880	4. 1134233	7538	2080	4. 1668266	5912
2870	4. 1141771	7506	2070	4. 1674178	5903
2860	4. 1149277	7494	2060	4. 1680081	5836
2850	4. 1156771	7480	2050	4. 1685917	5882
2840	4. 1164251	7467	2040	4. 1691805	5821
2830	4. 1171718	7455	2030	4. 1697626	5861
2820	4. 1179173	7359	2020	4. 1703487	5816
2810	4. 1186532	7429	2010	4. 1709303	5797
2800	4. 1193961	7334	2000	4. 1715100	5790
2790	4. 1201295	7322	1990	4. 1720890	5781
2780	4. 1208617	7310	1980	4. 1726671	5716
2770	4. 1215927	7215	1970	4. 1732387	5767
2760	4. 1223142	7285	1960	4. 1738154	5701
2750	4. 1230427	7273	1950	4. 1743855	5693
2740	4. 1237700	7179	1940	4. 1749548	5744
2730	4. 1244879	7168	1930	4. 1755292	5678
2720	4. 1252047	7155	1920	4. 1760970	5614
2710	4. 1259202	7144	1910	4. 1766584	5663
2700	4. 1266346	7132	1900	4. 1772247	5656
2690	4. 1273478	7040	1890	4. 1777903	5592
2680	4. 1280518	7108	1880	4. 1783495	5699
2670	4. 1287626	7017	1870	4. 1789194	5520
2660	4. 1294643	7005	1860	4. 1794714	5569
2650	4. 1301648	6995	1850	4. 1800283	5563
2640	4. 1308643	6982	1840	4. 1805846	5555
2630	4. 1315625	6972	1830	4. 1811401	5549
2620	4. 1322597	6880	1820	4. 1816950	5389
2610	4. 1329477	6950	1810	4. 1822434	5534
2600	4. 1336427	6858	1800	4. 1827968	5471
2590	4. 1343285	6848	1790	4. 1833439	5463
2580	4. 1350133	6837	1780	4. 1838902	5457
2570	4. 1356970	6827	1770	4. 1844359	5450
2560	4. 1363797	6815	1760	4. 1849809	5443
2550	4. 1370612	6805	1750	4. 1855252	5436
2540	4. 1377417	6715	1740	4. 1860688	5429
2530	4. 1384132	6705	1730	4. 1866117	5366
2520	4. 1390837	6774	1720	4. 1871483	5416
2510	4. 1397611	6683	1710	4. 1876899	5353
2500	4. 1404294	6675	1700	4. 1882252	5346
2490	4. 1410969	6663	1690	4. 1887598	5340
2480	4. 1417632	6654	1680	4. 1892938	5333
2470	4. 1424286	6565	1670	4. 1898271	5326
2460	4. 1430851	6633	1660	4 1903597	5326
2450	4. 1437484	6545	1650	4. 1908861	5314
2440	4. 1444029		1640	4. 1914175	

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TABLE XII.—*Tables of S*—Continued

S	Log seconds	Difference	S	Log seconds	Difference
4.685		.000	4.685		.000
		5307			4519
1630	4. 1919482	5245	0930	4. 2260239	4514
1620	4. 1924727	5238	0920	4. 2264753	4424
1610	4. 1929965	5232	0910	4. 2269177	4547
1600	4. 1935197	5226	0900	4. 2273724	4458
1590	4. 1940423	5220	0890	4. 2278182	4453
1580	4. 1945643	5213	0880	4. 2282635	4448
1570	4. 1950856	5207	0870	4. 2287083	4443
1560	4. 1956063	5146	0860	4. 2291526	4439
1550	4. 1961209	5195	0850	4. 2295965	4435
1540	4. 1966404	5133	0840	4. 2300400	4430
1530	4. 1971537	5127	0830	4. 2304830	4425
1520	4. 1976664	5140	0820	4. 2309255	4379
1510	4. 1981804	5133	0810	4. 2313634	4426
1500	4. 1986937	5082	0800	4. 2318050	4370
1490	4. 1992019	5094	0790	4. 2322420	4365
1480	4. 1997113	5097	0780	4. 2326785	4361
1470	4. 2002210	5064	0770	4. 2331146	4356
1460	4. 2007274	5058	0760	4. 2335502	4353
1450	4. 2012332	5025	0750	4. 2339855	4348
1440	4. 2017357	5028	0740	4. 2344203	4301
1430	4. 2022385	5040	0730	4. 2348504	4339
1420	4. 2027425	5023	0720	4. 2352843	4335
1410	4. 2032451	4992	0710	4. 2357178	4388
1400	4. 2037443	4978	0700	4. 2361466	4364
1390	4. 2042421	4972	0690	4. 2365730	4301
1380	4. 2047393	4967	0680	4. 2370031	4275
1370	4. 2052360	4960	0670	4. 2374306	4272
1360	4. 2057320	4946	0660	4. 2378578	4267
1350	4. 2062266	4914	0650	4. 2382845	4263
1340	4. 2067180	4908	0640	4. 2387108	4259
1330	4. 2072088	4929	0630	4. 2391367	4214
1320	4. 2077017	4888	0620	4. 2395581	4250
1310	4. 2081905	4882	0610	4. 2399831	4205
1300	4. 2086787	4877	0600	4. 2404036	4201
1290	4. 2091664	4871	0590	4. 2408237	4239
1280	4. 2096535	4830	0580	4. 2412476	4192
1270	4. 2101365	4862	0570	4. 2416668	4189
1260	4. 2106227	4816	0560	4. 2420857	4184
1250	4. 2111043	4834	0550	4. 2425041	4140
1240	4. 2115877	4800	0540	4. 2429181	4177
1230	4. 2120677	4821	0530	4. 2433358	4172
1220	4. 2125498	4789	0520	4. 2437530	4126
1210	4. 2130287	4758	0510	4. 2441656	4166
1200	4. 2135045	4778	0500	4. 2445822	4100
1190	4. 2139823	4748	0490	4. 2449922	4135
1180	4. 2144571	4750	0480	4. 2454057	4112
1170	4. 2149321	4728	0470	4. 2458169	4108
1160	4. 2154049	4749	0460	4. 2462277	4104
1150	4. 2158798	4709	0450	4. 2466381	4100
1140	4. 2163507	4703	0440	4. 2470481	4096
1130	4. 2168210	4699	0430	4. 2474577	4051
1120	4. 2172909	4693	0420	4. 2478628	4089
1110	4. 2177602	4685	0410	4. 2482717	4044
1100	4. 2182247	4686	0400	4. 2486761	4081
1090	4. 2187930	4676	0390	4. 2490842	4036
1080	4. 2191609	4666	0380	4. 2494878	4032
1070	4. 2196238	4623	0370	4. 2498910	4029
1060	4. 2200863	4620	0360	4. 2502939	4025
1050	4. 2205483	4614	0350	4. 2506964	4021
1040	4. 2210097	4610	0340	4. 2510985	3972
1030	4. 2214707	4606	0330	4. 2514957	4060
1020	4. 2219313	4557	0320	4. 2519017	3978
1010	4. 2223870	4587	0310	4. 2522995	3998
1000	4. 2228465	4578	0300	4. 2526993	3963
0990	4. 2233012	4569	0290	4. 2530956	3999
0980	4. 2237598	4538	0280	4. 2534955	3955
0970	4. 2242136	4532	0270	4. 2538910	3952
0960	4. 2246668	4529	0260	4. 2542862	3948
0950	4. 2251197	4523	0250	4. 2546810	3984
0940	4. 2255720		0240	4. 2550794	

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TABLE XIII

CONVERSION OF DECIMALS OF A DAY TO HOURS

D.	H. M. S.	H. M. S. / 100	H. M. S. / 100^2	D.	H. M. S.	H. M. S. / 100	H. M. S. / 100^2
d.	h. m. s.	m. s.	s.	d.	h. m. s.	m. s.	s.
0.01	0 14 24	0 8.64	0.09	0.51	12 14 24	7 20.64	4.41
0.02	0 28 48	0 17.28	0.17	0.52	12 28 48	7 29.28	4.49
0.03	0 43 12	0 25.92	0.26	0.53	12 43 12	7 37.92	4.58
0.04	0 57 36	0 34.56	0.35	0.54	12 57 36	7 46.56	4.67
0.05	1 12 0	0 43.20	0.43	0.55	13 12 0	7 55.20	4.75
0.06	1 26 24	0 51.84	0.52	0.56	13 26 24	8 3.84	4.84
0.07	1 40 48	1 0.48	0.60	0.57	13 40 48	8 12.48	4.92
0.08	1 55 12	1 9.12	0.69	0.58	13 55 12	8 21.12	5.01
0.09	2 9 36	1 17.76	0.78	0.59	14 9 36	8 29.76	5.10
0.10	2 24 0	1 26.40	0.86	0.60	14 24 0	8 38.40	5.18
0.11	2 38 24	1 35.04	0.95	0.61	14 38 24	8 47.04	5.27
0.12	2 52 48	1 43.68	1.04	0.62	14 52 48	8 55.68	5.36
0.13	3 7 12	1 52.32	1.12	0.63	15 7 12	9 4.32	5.44
0.14	3 21 36	2 0.96	1.21	0.64	15 21 36	9 12.96	5.53
0.15	3 36 0	2 9.60	1.30	0.65	15 36 0	9 21.60	5.62
0.16	3 50 24	2 18.24	1.38	0.66	15 50 24	9 30.24	5.70
0.17	4 4 48	2 26.88	1.47	0.67	16 4 48	9 38.88	5.79
0.18	4 19 12	2 35.52	1.56	0.68	16 19 12	9 47.52	5.88
0.19	4 33 36	2 44.16	1.64	0.69	16 33 36	9 56.16	5.96
0.20	4 48 0	2 52.80	1.73	0.70	16 48 0	10 4.80	6.05
0.21	5 2 24	3 1.44	1.81	0.71	17 2 24	10 13.44	6.13
0.22	5 16 48	3 10.08	1.90	0.72	17 16 48	10 22.08	6.22
0.23	5 31 12	3 18.72	1.99	0.73	17 31 12	10 30.72	6.31
0.24	5 45 36	3 27.36	2.07	0.74	17 45 36	10 39.36	6.39
0.25	6 0 0	3 36.00	2.16	0.75	18 0 0	10 48.00	6.48
0.26	6 14 24	3 44.64	2.25	0.76	18 14 24	10 56.64	6.57
0.27	6 28 48	3 53.28	2.33	0.77	18 28 48	11 5.28	6.65
0.28	6 43 12	4 1.92	2.42	0.78	18 43 12	11 13.92	6.74
0.29	6 57 36	4 10.56	2.51	0.79	18 57 36	11 22.56	6.83
0.30	7 12 0	4 19.20	2.59	0.80	19 12 0	11 31.20	6.91
0.31	7 26 24	4 27.84	2.68	0.81	19 26 24	11 39.84	7.00
0.32	7 40 48	4 36.48	2.76	0.82	19 40 48	11 48.48	7.08
0.33	7 55 12	4 45.12	2.85	0.83	19 55 12	11 57.12	7.17
0.34	8 9 36	4 53.76	2.94	0.84	20 9 36	12 5.76	7.26
0.35	8 24 0	5 2.40	3.02	0.85	20 24 0	12 14.40	7.34
0.36	8 38 24	5 11.04	3.11	0.86	20 38 24	12 23.04	7.43
0.37	8 52 48	5 19.68	3.20	0.87	20 52 48	12 31.68	7.52
0.38	9 7 12	5 28.32	3.28	0.88	21 7 12	12 40.32	7.60
0.39	9 21 36	5 36.96	3.37	0.89	21 21 36	12 48.96	7.69
0.40	9 36 0	5 45.60	3.46	0.90	21 36 0	12 57.60	7.78
0.41	9 50 24	5 54.24	3.54	0.91	21 50 24	13 6.24	7.86
0.42	10 4 48	6 2.88	3.63	0.92	22 4 48	13 14.88	7.95
0.43	10 19 12	6 11.52	3.72	0.93	22 19 12	13 23.52	8.04
0.44	10 33 36	6 20.16	3.80	0.94	22 33 36	13 32.16	8.12
0.45	10 48 0	6 28.80	3.89	0.95	22 48 0	13 40.80	8.21
0.46	11 2 24	6 37.44	3.97	0.96	23 2 24	13 49.44	8.29
0.47	11 16 48	6 46.08	4.06	0.97	23 16 48	13 58.08	8.38
0.48	11 31 12	6 54.72	4.15	0.98	23 31 12	14 6.72	8.47
0.49	11 45 36	7 3.36	4.23	0.99	23 45 36	14 15.36	8.55
0.50	12 0 0	7 12.00	4.32	1.00	24 0 0	14 24.00	8.64

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TABLE XIV

INCLINATION CORRECTIONS FOR 50-METER TAPE

(Correction $= -0.01h^2 - 0.000001h^4$ (h in meters))

Difference of elevation		Correction	Difference of elevation		Correction	Difference of elevation		Correction	Difference of elevation		Correction
Meters	Feet	Mm.	Meters	Feet	Mm.	Meters	Feet	Mm.	Meters	Feet	Mm.
0.00	0.000	0.0	0.65	2.133	4.2	1.30	4.265	16.9	1.95	6.398	38.0
.01	.033	.0	.66	2.165	4.4	1.31	4.298	17.2	1.96	6.430	38.4
.02	.066	.0	.67	2.198	4.5	1.32	4.331	17.4	1.97	6.463	38.8
.03	.098	.0	.68	2.231	4.6	1.33	4.364	17.7	1.98	6.496	39.2
.04	.131	.0	.69	2.264	4.8	1.34	4.396	18.0	1 99	6.529	39.6
.05	.164	.0	.70	2.297	4.9	1.35	4.429	18.2	2.00	6.562	40.0
.06	.197	.0	.71	2.329	5.0	1.36	4.462	18.5	2.01	6.594	40.4
.07	.230	.0	.72	2.362	5.2	1.37	4.495	18.8	2.02	6.627	40.8
.08	.262	.1	.73	2.395	5.3	1.38	4.528	19.0	2.03	6.660	41.2
.09	.295	.1	.74	2.428	5.5	1.39	4.560	19.3	2.04	6.693	41.6
.10	.328	.1	.75	2.461	5.6	1.40	4.593	19.6	2.05	6.726	42.0
.11	.361	.1	.76	2.493	5.8	1.41	4.626	19.9	2.06	6.759	42.5
.12	.394	.1	.77	2.526	5.9	1.42	4.659	20.2	2.07	6.791	42.9
.13	.427	.2	.78	2.559	6.1	1.43	4.692	20.4	2.08	6.824	43.3
.14	.459	.2	.79	2.592	6.2	1.44	4.724	20.7	2.09	6.857	43.7
.15	.492	.2	.80	2.625	6.4	1.45	4.757	21.0	2.10	6.890	44.1
.16	.525	.3	.81	2.657	6.6	1.46	4.790	21.3	2.11	6.923	44.5
.17	.558	.3	.82	2.690	6.7	1.47	4.823	21.6	2.12	6.955	45.0
.18	.591	.3	.83	2.723	6.9	1.48	4.856	21.9	2.13	6.988	45.4
.19	.623	.4	.84	2.756	7.1	1.49	4.888	22.2	2.14	7.021	45.8
.20	.656	.4	.85	2.789	7.2	1.50	4.921	22.5	2.15	7.054	46.2
.21	.689	.4	.86	2.822	7.4	1.51	4.954	22.8	2.16	7.087	46.7
.22	.722	.5	.87	2.854	7.6	1.52	4.987	23.1	2.17	7.119	47.1
.23	.755	.5	.88	2.887	7.7	1.53	5.020	23.4	2.18	7.152	47.5
.24	.787	.6	.89	2.920	7.9	1.54	5.052	23.7	2.19	7.185	48.0
.25	.820	.6	.90	2.953	8.1	1.55	5.085	24.0	2.20	7.218	48.4
.26	.853	.7	.91	2.986	8.3	1.56	5.118	24.3	2.21	7.251	48.9
.27	.886	.7	.92	3.018	8.5	1.57	5.151	24.6	2.22	7.283	49.3
.28	.919	.8	.93	3.051	8.6	1.58	5.184	25.0	2.23	7.316	49.8
.29	.951	.8	.94	3.084	8.8	1.59	5.217	25.3	2.24	7.349	50.2
.30	.984	.9	.95	3.117	9.0	1.60	5.249	25.6	2.25	7.382	50.7
.31	1.017	1.0	.96	3.150	9.2	1.61	5.282	25.9	2.26	7.415	51.1
.32	1.050	1.0	.97	3.182	9.4	1.62	5.315	26.2	2.27	7.447	51.6
.33	1.083	1.1	.98	3.215	9.6	1.63	5.348	26.6	2.28	7.480	52.0
.34	1.115	1.2	.99	3.248	9.8	1.64	5.381	26.9	2.29	7.513	52.5
.35	1.148	1.2	1.00	3.281	10.0	1.65	5.413	27.2	2.30	7.546	52.9
.36	1.181	1.3	1.01	3.314	10.2	1.66	5.446	27.6	2.31	7.579	53.4
.37	1.214	1.4	1.02	3.346	10.4	1.67	5.479	27.9	2.32	7.612	53.9
.38	1.247	1.4	1.03	3.379	10.6	1.68	5.512	28.2	2 33	7.644	54.3
.39	1.280	1.5	1.04	3.412	10.8	1.69	5.545	28.6	2.34	7.677	54.8
.40	1.312	1.6	1.05	3.445	11.0	1.70	5.577	28.9	2.35	7.710	55.3
.41	1.345	1.7	1.06	3.478	11.2	1.71	5.610	29.2	2.36	7.743	55.7
.42	1.378	1.8	1.07	3.510	11.4	1.72	5.643	29.6	2.37	7.776	56 2
.43	1.411	1.8	1.08	3.543	11.7	1.73	5.676	29.9	2.38	7.808	56.7
.44	1.444	1.9	1.09	3.576	11.9	1.74	5.709	30.3	2.39	7.841	57.2
.45	1.476	2.0	1.10	3.609	12.1	1.75	5.741	30.6	2.40	7.874	57.6
.46	1.509	2.1	1.11	3.642	12.3	1.76	5.774	31.0	2.41	7.907	58.1
.47	1.542	2.2	1.12	3.675	12.5	1.77	5.807	31.3	2.42	7.940	58.6
.48	1.575	2.3	1.13	3.707	12.8	1.78	5.840	31.7	2.43	7.972	59.1
.49	1.608	2.4	1.14	3.740	13.0	1.79	5.873	32.0	2.44	8.005	59.6
.50	1.640	2.5	1.15	3.773	13.2	1.80	5.906	32.4	2.45	8.038	60.1
.51	1.673	2.6	1.16	3.806	13.5	1.81	5.938	32.8	2.46	8.071	60.6
.52	1.706	2.7	1.17	3.839	13.7	1.82	5.971	33.1	2.47	8.104	61.0
.53	1.739	2.8	1.18	3.871	13.9	1.83	6.004	33.5	2.48	8.136	61.5
.54	1.772	2.9	1.19	3.904	14.2	1.84	6.037	33.9	2.49	8.169	62.0
.55	1.804	3.0	1.20	3.937	14.4	1.85	6.070	34.2	2.50	8.202	62.5
.56	1.837	3.1	1.21	3.970	14.6	1.86	6.102	34.6	2.51	8.235	63.0
.57	1.870	3.2	1.22	4.003	14.9	1.87	6.135	35.0	2.52	8.268	63.5
.58	1.903	3.4	1.23	4.035	15.1	1.88	6.168	35.3	2.53	8.301	64.0
.59	1.936	3.5	1.24	4.068	15.4	1.89	6.201	35.7	2.54	8.333	64.6
.60	1.968	3.6	1.25	4.101	15.6	1.90	6.234	36.1	2.55	8.366	65.1
.61	2.001	3.7	1.26	4.134	15.9	1.91	6.266	36.5	2.56	8.?99	65.6
.62	2.034	3.8	1.27	4.167	16.1	1.92	6.299	36.9	2.57	8.432	66.1
.63	2.067	4.0	1.28	4.199	16.4	1.93	6.332	37.2	2.58	8.465	66.6
.64	2.100	4.1	1.29	4.232	16.6	1.94	6.365	37.6	2.59	8.497	67.1

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TABLE XIV.—*Inclination corrections for 50-meter tape*—Continued

nce of tion	Correc-tion	Difference of elevation		Correc-tion	Difference of elevation		Correc-tion	Difference of elevation		Correc-tion
Feet	Mm.	Meters	Feet	Mm.	Meters	Feet	Mm.	Meters	Feet	Mm.
8.530	67.6	3.25	10.663	105.7	3.90	12.795	152.3	4.55	14.928	207.5
8.563	68.2	3.26	10.696	106.4	3.91	12.828	153.1	4.56	14.961	208.4
8.596	68.7	3.27	10.728	107.0	3.92	12.861	153.9	4.57	14.993	209.3
8.629	69.2	3.28	10.761	107.7	3.93	12.894	154.7	4.58	15.026	210.2
8.661	69.7	3.29	10.794	108.4	3.94	12.926	155.5	4.59	15,059	211.1
8.694	70.3	3.30	10.827	109.0	3.95	12.959	156.3	4.60	15.092	212.0
8.727	70.8	3.31	10.860	109.7	3.96	12.992	157.1	4.61	15.125	213.0
8.760	71.3	3.32	10.892	110.3	3.97	13.025	157.9	4.62	15.157	213.9
8.793	71.9	3.33	10.925	111.0	3.98	13.058	158.7	4.63	15.190	214.8
8.825	72.4	3.34	10.958	111.7	3.99	13.091	159.5	4.64	15.223	215.8
8.858	73.0	3.35	10.991	112.4	4.00	13.123	160.3	4.65	15.256	216.7
8.891	73.5	3.36	11.024	113.0	4.01	13.156	161.1	4.66	15.289	217.6
8.924	74.0	3.37	11.056	113.7	4.02	13.189	161.9	4.67	15.321	218.6
8.957	74.6	3.38	11.089	114.4	4.03	13.222	162.7	4.68	15.354	219.5
8.989	75.1	3.39	11.122	115.1	4.04	13.255	163.5	4.69	15.387	220.4
9.022	75.7	3.40	11.155	115.7	4.05	13.287	164.3	4.70	15.420	221.4
9.055	76.2	3.41	11.188	116.4	4.06	13.320	165.1	4.71	15.453	222.3
9.088	76.8	3.42	11.220	117.1	4.07	13.353	165.9	4.72	15.486	223.3
9.121	77.3	3.43	11.253	117.8	4.08	13.386	166.7	4.73	15.518	224.2
9.154	77.9	3.44	11.286	118.5	4.09	13.419	167.6	4.74	15.551	225.2
9.186	78.5	3.45	11.319	119.2	4.10	13.451	168.4	4.75	15.584	226.1
9.219	79.0	3.46	11.352	119.9	4.11	13.484	169.2	4.76	15.617	227.1
9.252	79.6	3.47	11.384	120.6	4.12	13.517	170.0	4.77	15.650	228.0
9.285	80.2	3.48	11.417	121.3	4.13	13.550	170.9	4.78	15.682	229.0
9.318	80.7	3.49	11.450	122.0	4.14	13.583	171.7	4.79	15.715	230.0
9.350	81.3	3.50	11.483	122.7	4.15	13.615	172.5	4.80	15.748	230.9
9.383	81.9	3.51	11.516	123.4	4.16	13.648	173.4	4.81	15.781	231.9
9.416	82.4	3.52	11.549	124.1	4.17	13.681	174.2	4.82	15.814	232.9
9.449	83.0	3.53	11.581	124.8	4.18	13.714	175.0	4.83	15.846	233.8
9.482	83.6	3.54	11.614	125.5	4.19	13.747	175.9	4.84	15.879	234.8
9.514	84.2	3.55	11.647	126.2	4.20	13.780	176.7	4.85	15.912	235.8
9.547	84.8	3.56	11.680	126.9	4.21	13.812	177.6	4.86	15.945	236.8
9.580	85.3	3.57	11.713	127.6	4.22	13.845	178.4	4.87	15.978	237.7
9.613	85.9	3.58	11.745	128.3	4.23	13.878	179.2	4.88	16.010	238.7
9.646	86.5	3.59	11.778	129.0	4.24	13.911	180.1	4.89	16.043	239.7
9.678	87.1	3.60	11.811	129.8	4.25	13.944	181.0	4.90	16.076	240.7
9.711	87.7	3.61	11.844	130.5	4.26	13.976	181.8	4.91	16.109	241.7
9.744	88.3	3.62	11.877	131.2	4.27	14.009	182.7	4.92	16.142	242.7
9.777	88.9	3.63	11.909	131.9	4.28	14.042	183.5	4.93	16.175	243.6
9.810	89.5	3.64	11.942	132.7	4.29	14.075	184.4	4.94	16.207	244.6
9.842	90.1	3.65	11.975	133.4	4.30	14.108	185.2	4.95	16.240	245.6
9.875	90.7	3.66	12.008	134.1	4.31	14.140	186.1	4.96	16.273	246.6
9.908	91.3	3.67	12.041	134.9	4.32	14.173	187.0	4.97	16.306	247.6
9.941	91.9	3.68	12.073	135.6	4.33	14.206	187.8	4.98	16.339	248.6
9.974	92.5	3.69	12.106	136.3	4.34	14.239	188.7	4.99	16.371	249.6
10.007	93.1	3.70	12.139	137.1	4.35	14.272	189.6	5.00	16.404	250.6
10.039	93.7	3.71	12.172	137.8	4.36	14.304	190.5	5.01	16.437	251.6
10.072	94.3	3.72	12.205	138.6	4.37	14.337	191.3	5.02	16.470	252.6
10.105	95.0	3.73	12.238	139.3	4.38	14.370	192.2	5.03	16.503	253.6
10.138	95.6	3.74	12.270	140.1	4.39	14.403	193.1	5.04	16.535	254.7
10.171	96.2	3.75	12.303	140.8	4.40	14.436	194.0	5.05	16.568	255.7
10.203	96.8	3.76	12.336	141.6	4.41	14.468	194.9	5.06	16.601	256.7
10.236	97.4	3.77	12.369	142.3	4.42	14.501	195.7	5.07	16.634	257.7
10.269	98.1	3.78	12.402	143.1	4.43	14.534	196.6	5.08	16.667	258.7
10.302	98.7	3.79	12.434	143.8	4.44	14.567	197.5	5.09	16.699	259.8
10.335	99.3	3.80	12.467	144.6	4.45	14.600	198.4	5.10	16.732	260.8
10.367	100.0	3.81	12.500	145.4	4.46	14.633	199.3	5.11	16.765	261.8
10.400	100.6	3.82	12.533	146.1	4.47	14.665	200.2	5.12	16.798	262.8
10.433	101.2	3.83	12.566	146.9	4.48	14.698	201.1	5.13	16.831	263.9
10.466	101.9	3.84	12.598	147.7	4.49	14.731	202.0	5.14	16.863	264.9
10.499	102.5	3.85	12.631	148.4	4.50	14.764	202.9	5.15	16.896	265.9
10.531	103.1	3.86	12.664	149.2	4.51	14.797	203.8	5.16	16.929	267.0
10.564	103.8	3.87	12.697	150.0	4.52	14.829	204.7	5.17	16.962	268.0
10.597	104.4	3.88	12.730	150.8	4.53	14.862	295.6	5.18	16.995	269.0
10.630	105.1	3.89	12.762	151.6	4.54	14.895	206.5	5.19	17.028	270.1

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TABLE XIV.—*Inclination corrections for 50-meter tape*—Continued

Difference of elevation		Correction	Difference of elevation		Correction	Difference of elevation		Correction	Difference of elevation		Correction
Meters	Feet	Mm.	Meters	Feet	Mm.	Meters	Feet	Mm.	Meters	Feet	Mm.
5.20	17.060	271.1	5.80	19.029	337.5	6.40	20.997	411.3	7.00	22.966	492.4
5.21	17.093	272.2	5.81	19.062	338.7	6.41	21.030	412.6	7.01	22.999	493.8
5.22	17.126	273.2	5.82	19.094	339.9	6.42	21.063	413.9	7.02	23.031	495.2
5.23	17.159	274.3	5.83	19.127	341.0	6.43	21.096	415.2	7.03	23.064	496.6
5.24	17.192	275.3	5.84	19.160	342.2	6.44	21.129	416.5	7.04	23.097	498.1
5.25	17.224	276.4	5.85	19.193	343.4	6.45	21.161	417.8	7.05	23.130	499.5
5.26	17.257	277.4	5.86	19.226	344.6	6.46	21.194	419.1	7.06	23.163	500.9
5.27	17.290	278.5	5.87	19.258	345.8	6.47	21.227	420.4	7.07	23.195	502.3
5.28	17.323	279.6	5.88	19.291	346.9	6.48	21.260	421.7	7.08	23.228	503.8
5.29	17.356	280.6	5.89	19.324	348.1	6.49	21.293	423.0	7.09	23.261	505.2
5.30	17.388	281.7	5.90	19.357	349.3	6.50	21.325	424.3	7.10	23.294	506.6
5.31	17.421	282.8	5.91	19.390	350.5	6.51	21.358	425.6	7.11	23.327	508.1
5.32	17.454	283.8	5.92	19.423	351.7	6.52	21.391	426.9	7.12	23.360	509.5
5.33	17.487	284.9	5.93	19.455	352.9	6.53	21.424	428.2	7.13	23.392	511.0
5.34	17.520	286.0	5.94	19.488	354.1	6.54	21.457	429.5	7.14	23.425	512.4
5.35	17.552	287.0	5.95	19.521	355.3	6.55	21.489	430.9	7.15	23.458	513.8
5.36	17.585	288.1	5.96	19.554	356.5	6.56	21.522	432.2	7.16	23.491	515.3
5.37	17.618	289.2	5.97	19.587	357.7	6.57	21.555	433.5	7.17	23.524	516.7
5.38	17.651	290.3	5.98	19.619	358.9	6.58	21.588	434.8	7.18	23.556	518.2
5.39	17.684	291.4	5.99	19.652	360.1	6.59	21.621	436.2	7.19	23.589	519.6
5.40	17.716	292.5	6.00	19.685	361.3	6.60	21.654	437.5	7.20	23.622	521.1
5.41	17.749	293.5	6.01	19.718	362.5	6.61	21.686	438.8	7.21	23.655	522.5
5.42	17.782	294.6	6.02	19.751	363.7	6.62	21.719	440.2	7.22	23.688	524.0
5.43	17.815	295.7	6.03	19.783	364.9	6.63	21.752	441.5	7.23	23.720	525.5
5.44	17.848	296.8	6.04	19.816	366.1	6.64	21.785	442.8	7.24	23.753	526.9
5.45	17.881	297.9	6.05	19.849	367.4	6.65	21.818	444.2	7.25	23.786	528.4
5.46	17.913	299.0	6.06	19.882	368.6	6.66	21.850	445.5	7.26	23.819	529.9
5.47	17.946	300.1	6.07	19.915	369.8	6.67	21.883	446.9	7.27	23.852	531.3
5.48	17.979	301.2	6.08	19.947	371.0	6.68	21.916	448.2	7.28	23.884	532.8
5.49	18.012	302.3	6.09	19.980	372.3	6.69	21.949	449.6	7.29	23.917	534.3
5.50	18.045	303.4	6.10	20.013	373.5	6.70	21.982	450.9	7.30	23.950	535.7
5.51	18.077	304.5	6.11	20.046	374.7	6.71	22.014	452.3	7.31	23.983	537.2
5.52	18.110	305.6	6.12	20.079	375.9	6.72	22.047	453.6	7.32	24.016	538.7
5.53	18.143	306.7	6.13	20.112	377.2	6.73	22.080	455.0	7.33	24.049	540.2
5.54	18.176	307.9	6.14	20.144	378.4	6.74	22.113	456.3	7.34	24.081	541.7
5.55	18.209	309.0	6.15	20.177	379.7	6.75	22.146	457.7	7.35	24.114	543.1
5.56	18.241	310.1	6.16	20.210	380.9	6.76	22.178	459.1	7.36	24.147	544.6
5.57	18.274	311.2	6.17	20.243	382.1	6.77	22.211	460.4	7.37	24.180	546.1
5.58	18.307	312.3	6.18	20.276	383.4	6.78	22.244	461.8	7.38	24.213	547.6
5.59	18.340	313.5	6.19	20.308	384.6	6.79	22.277	463.2	7.39	24.245	549.1
5.60	18.373	314.6	6.20	20.341	385.9	6.80	22.310	464.5	7.40	24.278	550.6
5.61	18.405	315.7	6.21	20.374	387.1	6.81	22.342	465.9	7.41	24.311	552.1
5.62	18.438	316.8	6.22	20.407	388.4	6.82	22.375	467.3	7.42	24.344	553.6
5.63	18.471	318.0	6.23	20.440	389.6	6.83	22.408	468.7	7.43	24.377	555.1
5.64	18.504	319.1	6.24	20.472	390.9	6.84	22.441	470.0	7.44	24.409	556.6
5.65	18.537	320.2	6.25	20.505	392.2	6.85	22.474	471.4	7.45	24.442	558.1
5.66	18.570	321.4	6.26	20.538	393.4	6.86	22.507	472.8	7.46	24.475	559.6
5.67	18.602	322.5	6.27	20.571	394.7	6.87	22.539	474.2	7.47	24.508	561.1
5.68	18.635	323.7	6.28	20.604	395.9	6.88	22.572	475.6	7.48	24.541	562.6
5.69	18.668	324.8	6.29	20.636	397.2	6.89	22.605	477.0	7.49	24.573	564.1
5.70	18.701	326.0	6.30	20.669	398.5	6.90	22.638	478.4	7.50	24.606	565.7
5.71	18.734	327.1	6.31	20.702	399.7	6.91	22.671	479.8			
5.72	18.766	328.3	6.32	20.735	401.0	6.92	22.703	481.2			
5.73	18.799	329.4	6.33	20.768	402.3	6.93	22.736	482.6			
5.74	18.832	330.6	6.34	20.800	403.6	6.94	22.769	484.0			
5.75	18.865	331.7	6.35	20.833	404.9	6.95	22.802	485.4			
5.76	18.898	332.9	9.36	20.866	406.1	6.96	22.835	486.8			
5.77	18.930	334.0	6.37	20.899	407.4	6.97	22.867	488.2			
5.78	18.963	335.2	6.38	20.932	408.7	6.98	22.900	489.6			
5.79	18.996	336.4	6.39	20.965	410.0	6.99	22.933	491.0			

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TABLE XV

CURVATURE AND REFRACTION

(Differences in feet between the apparent and true level at distances varying from 1 to 66 miles)

Distance (miles)	Difference in feet for—			Distance (miles)	Difference in feet for—		
	Curvature	Refraction	Curvature and refraction		Curvature	Refraction	Curvature and refraction
1	0.7	0.1	0.6	34	771.3	108.0	663.3
2	2.7	.4	2.3	35	817.4	114.4	703.0
3	6.0	.8	5.2	36	864.8	121.1	743.7
4	10.7	1.5	9.2	37	913.5	127.9	785.6
5	16.7	2.3	14.4	38	963.5	134.9	828.6
6	24.0	3.4	20.6	39	1014.9	142.1	872.8
7	32.7	4.6	28.1	40	1067.6	149.5	918.1
8	42.7	6.0	36.7	41	1121.7	157.0	964.7
9	54.0	7.6	46.4	42	1177.0	164.8	1012.2
10	66.7	9.3	57.4	43	1233.7	172.7	1061.0
11	80.7	11.3	69.4	44	1291.8	180.8	1111.0
12	96.1	13.4	82.7	45	1351.2	189.2	1162.0
13	112.8	15.8	97.0	46	1411.9	197.7	1214.2
14	130.8	18.3	112.5	47	1474.0	206.3	1267.7
15	150.1	21.0	129.1	48	1537.3	215.2	1322.1
16	170.8	23.9	146.9	49	1602.0	224.3	1377.7
17	192.8	27.0	165.8	50	1668.1	233.5	1434.6
18	216.2	30.3	185.9	51	1735.5	243.0	1492.5
19	240.9	33.7	207.2	52	1804.2	252.6	1551.6
20	266.9	37.4	229.5	53	1874.3	262.4	1611.9
21	294.3	41.2	253.1	54	1945.7	272.4	1673.3
22	322.9	45.2	277.7	55	2018.4	282.6	1735.8
23	353.0	49.4	303.6	56	2092.5	292.9	1799.6
24	384.3	53.8	330.5	57	2167.9	303.5	1864.4
25	417.0	58.4	358.6	58	2244.6	314.2	1930.4
26	451.1	63.1	388.0	59	2322.7	325.2	1997.5
27	486.4	68.1	418.3	60	2402.1	336.3	2065.8
28	523.1	73.2	449.9	61	2482.8	347.6	2135.2
29	561.2	78.6	482.6	62	2564.9	359.1	2205.8
30	600.5	84.1	516.4	63	2648.3	370.8	2277.5
31	641.2	89.8	551.4	64	2733.0	382.6	2350.4
32	683.3	95.7	587.6	65	2819.1	394.7	2424.4
33	726.6	101.7	624.9	66	2906.5	406.9	2499.6

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TABLE XVI

CORRECTIONS FOR VERTICAL ANGLES

(Angle K for correcting nonreciprocal vertical angles for curvature and refraction)

Distance in feet	K	Distance in feet	K	Distance in feet	K
	′ ″		′ ″		′ ″
1,000	0 04	7,000	0 30	50,000	3 32
2,000	0 08	8,000	0 34	60,000	4 15
3,000	0 13	9,000	0 38	70,000	4 57
4,000	0 17	10,000	0 42	80,000	5 40
5,000	0 21	20,000	1 25	90,000	6 22
6,000	0 25	30,000	2 07	100,000	7 05
		40,000	2 50		

Intermediate values may be obtained by adding two K's from the table and one second for each additional 250 feet.

A mean coefficient of refraction of 0.07 has been assumed for above table.

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TABLE XVII

COMMON LOGARITHMS OF m, SPHERICAL EXCESS FACTOR

(Computed for the Clarke spheroid of 1866 as expressed in meters)

Latitude	Log m	Latitude	Log m	Latitude	Log m	Latitude	Log m
° ′		° ′		° ′		° ′	
0 00	1.40695 −10	20 00	1.40626 −10	40 00	1.40452 −10	60 00	1.40253 −10
0 30	695 −10	20 30	623 −10	40 30	446 −10	60 30	249 −10
1 00	695 −10	21 00	619 −10	41 00	441 −10	61 00	244 −10
1 30	694 −10	21 30	616 −10	41 30	436 −10	61 30	240 −10
2 00	694 −10	22 00	612 −10	42 00	431 −10	62 00	235 −10
2 30	694 −10	22 30	608 −10	42 30	426 −10	62 30	231 −10
3 00	693 −10	23 00	605 −10	43 00	421 −10	63 00	227 −10
3 30	693 −10	23 30	601 −10	43 30	416 −10	63 30	223 −10
4 00	692 −10	24 00	597 −10	44 00	411 −10	64 00	219 −10
4 30	691 −10	24 30	594 −10	44 30	406 −10	64 30	215 −10
5 00	690 −10	25 00	590 −10	45 00	400 −10	65 00	210 −10
5 30	689 −10	25 30	586 −10	45 30	395 −10	65 30	207 −10
6 00	688 −10	26 00	582 −10	46 00	390 −10	66 00	203 −10
6 30	687 −10	26 30	578 −10	46 30	385 −10	66 30	199 −10
7 00	686 −10	27 00	573 −10	47 00	380 −10	67 00	195 −10
7 30	685 −10	27 30	569 −10	47 30	375 −10	67 30	192 −10
8 00	683 −10	28 00	565 −10	48 00	369 −10	68 00	188 −10
8 30	682 −10	28 30	560 −10	48 30	364 −10	68 30	185 −10
9 00	680 −10	29 00	556 −10	49 00	359 −10	69 00	181 −10
9 30	679 −10	29 30	552 −10	49 30	354 −10	69 30	178 −10
10 00	677 −10	30 00	548 −10	50 00	349 −10	70 00	174 −10
10 30	675 −10	30 30	544 −10	50 30	344 −10	70 30	171 −10
11 00	673 −10	31 00	539 −10	51 00	339 −10	71 00	168 −10
11 30	671 −10	31 30	534 −10	51 30	334 −10	71 30	164 −10
12 00	669 −10	32 00	530 −10	52 00	329 −10	72 00	1.40161 −10
12 30	667 −10	32 30	525 −10	52 30	324 −10		
13 00	665 −10	33 00	520 −10	53 00	319 −10		
13 30	663 −10	33 30	516 −10	53 30	314 −10		
14 00	660 −10	34 00	511 −10	54 00	309 −10		
14 30	658 −10	34 30	506 −10	54 30	304 −10		
15 00	655 −10	35 00	501 −10	55 00	299 −10		
15 30	653 −10	35 30	496 −10	55 30	295 −10		
16 00	650 −10	36 00	491 −10	56 00	290 −10		
16 30	647 −10	36 30	486 −10	56 30	285 −10		
17 00	644 −10	37 00	482 −10	57 00	280 −10		
17 30	642 −10	37 30	477 −10	57 30	276 −10		
18 00	639 −10	38 00	472 −10	58 00	271 −10		
18 30	636 −10	38 30	467 −10	58 30	266 −10		
19 00	632 −10	39 00	462 −10	59 00	262 −10		
19 30	1.40629 −10	39 30	1.40457 −10	59 30	1.40257 −10		

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TABLE XVIII

AZIMUTHS OF POLARIS AT ELONGATION, FOR THE YEARS 1940–50

(Computed by the U. S. Naval Observatory)

Latitude	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
25	1 7.6	1 7.3	1 7.0	1 6.7	1 6.4	1 6.1	1 5.7	1 5.3	1 5.0	1 4.6	1 4.2
26	8.2	7.9	7.6	7.3	7.0	6.6	6.3	5.9	5.5	5.1	4.8
27	8.8	8.5	8.2	7.9	7.5	7.2	6.8	6.5	6.1	5.7	5.3
28	9.4	9.1	8.8	8.5	8.2	7.8	7.4	7.1	6.7	6.3	5.9
29	10.1	9.8	9.5	9.2	8.8	8.5	8.1	7.7	7.3	6.9	6.5
30	10.8	10.5	10.2	9.8	9.5	9.1	8.8	8.4	8.0	7.6	7.2
31	11.5	11.2	10.9	10.6	10.2	9.9	9.5	9.1	8.7	8.3	7.9
32	12.3	12.0	11.7	11.3	11.0	10.6	10.2	9.8	9.4	9.0	8.6
33	13.1	12.8	12.5	12.1	11.8	11.4	11.0	10.6	10.2	9.8	9.4
34	13.9	13.6	13.3	13.0	12.6	12.2	11.8	11.4	11.0	10.6	10.2
35	14.8	14.5	14.2	13.8	13.5	13.1	12.7	12.3	11.9	11.5	11.1
36	15.8	15.4	15.1	14.8	14.4	14.0	13.6	13.2	12.8	12.4	11.9
37	16.8	16.4	16.1	15.7	15.4	15.0	14.6	14.1	13.7	13.3	12.9
38	17.8	17.5	17.1	16.8	16.4	16.0	15.6	15.1	14.7	14.3	13.9
39	18.9	18.5	18.2	17.8	17.4	17.0	16.6	16.2	15.8	15.3	14.9
40	20.0	19.7	19.3	19.0	18.6	18.2	17.7	17.3	16.9	16.4	16.0
41	21.2	20.9	20.5	20.1	19.7	19.3	18.9	18.5	18.0	17.6	17.1
42	22.5	22.1	21.8	21.4	21.0	20.6	20.1	19.7	19.2	18.8	18.3
43	23.8	23.5	23.1	22.7	22.3	21.9	21.4	21.0	20.5	20.0	19.6
44	25.2	24.9	24.5	24.1	23.7	23.2	22.8	22.3	21.9	21.4	20.9
45	26.7	26.3	25.9	25.5	25.1	24.7	24.2	23.7	23.3	22.8	22.3
46	28.2	27.9	27.5	27.1	26.6	26.2	25.7	25.2	24.8	24.3	23.8
47	29.9	29.5	29.1	28.7	28.3	27.8	27.3	26.8	26.3	25.8	25.3
48	31.6	31.2	30.8	30.4	30.0	29.5	29.0	28.5	28.0	27.5	27.0
49	33.4	33.0	32.6	32.2	31.7	31.3	30.8	30.3	29.8	29.2	28.7
50	1 35.4	1 35.0	1 34.5	1 34.1	1 33.6	1 33.2	1 32.6	1 32.1	1 31.6	1 31.1	1 30.6

Corrections for middle of months

For middle of—	Correction
	′
Jan.	−0.5
Feb.	−0.4
Mar.	−0.3
Apr.	−0.1
May	+0.1
June	+0.2
July	+0.2
Aug.	+0.1
Sept.	−0.1
Oct.	−0.3
Nov.	−0.6
Dec.	−0.8

These data may be secured annually from the current Nautical Ephemeris or other similar source.

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TABLE XIX

CONVERSION OF ARC INTO TIME, AND TIME INTO ARC

(Conversion of arc into time)

°	h. m.	°	h. m.	°	h. m.	°	h. m.	°	h. m.	°	h. m.	′	m. s.	″	s.
0	0 0	60	4 0	120	8 0	180	12 0	240	16 0	300	20 0	0	0 0	0	0.000
1	0 4	61	4 4	121	8 4	181	12 4	241	16 4	301	20 4	1	0 4	1	0.067
2	0 8	62	4 8	122	8 8	182	12 8	242	16 8	302	20 8	2	0 8	2	0.133
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12	3	0 12	3	0.200
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16	4	0 16	4	0.267
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20	5	0 20	5	0.333
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24	6	0 24	6	0.400
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28	7	0 28	7	0.467
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32	8	0 32	8	0.533
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36	9	0 36	9	0.600
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40	10	0 40	10	0.667
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44	11	0 44	11	0.733
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48	12	0 48	12	0.800
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52	13	0 52	13	0.867
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56	14	0 56	14	0.933
15	1 0	75	5 0	135	9 0	195	13 0	255	17 0	315	21 0	15	1 0	15	1.000
16	1 4	76	5 4	136	9 4	196	13 4	256	17 4	316	21 4	16	1 4	16	1.067
17	1 8	77	5 8	137	9 8	197	13 8	257	17 8	317	21 8	17	1 8	17	1.133
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12	18	1 12	18	1.200
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16	19	1 16	19	1.267
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20	20	1 20	20	1.333
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24	21	1 24	21	1.400
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28	22	1 28	22	1.467
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32	23	1 32	23	1.533
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36	24	1 36	24	1.600
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40	25	1 40	25	1.667
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44	26	1 44	26	1.733
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48	27	1 48	27	1.800
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52	28	1 52	28	1.867
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56	29	1 56	29	1.933
30	2 0	90	6 0	150	10 0	210	14 0	270	18 0	330	22 0	30	2 0	30	2.000
31	2 4	91	6 4	151	10 4	211	14 4	271	18 4	331	22 4	31	2 4	31	2.067
32	2 8	92	6 8	152	10 8	212	14 8	272	18 8	332	22 8	32	2 8	32	2.133
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12	33	2 12	33	2.200
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16	34	2 16	34	2.267
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20	35	2 20	35	2.333
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24	36	2 24	36	2.400
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28	37	2 28	37	2.467
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32	38	2 32	38	2.533
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36	39	2 36	39	2.600
40	2 40	100	6 40	160	10 40	220	14 40	280	18 40	340	22 40	40	2 40	40	2.667
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44	41	2 44	41	2.733
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48	42	2 48	42	2.800
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52	43	2 52	43	2.867
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56	44	2 56	44	2.933
45	3 0	105	7 0	165	11 0	225	15 0	285	19 0	345	23 0	45	3 0	45	3.000
46	3 4	106	7 4	166	11 4	226	15 4	286	19 4	346	23 4	46	3 4	46	3.067
47	3 8	107	7 8	167	11 8	227	15 8	287	19 8	347	23 8	47	3 8	47	3.133
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12	48	3 12	48	3.200
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16	49	3 16	49	3.267
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20	50	3 20	50	3.333
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24	51	3 24	51	3.400
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28	52	3 28	52	3.467
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32	53	3 32	53	3.533
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36	54	3 36	54	3.600
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40	55	3 40	55	3.667
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44	56	3 44	56	3.733
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48	57	3 48	57	3.800
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52	58	3 52	58	3.867
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56	59	3 56	59	3.933
60	4 0	120	8 0	180	12 0	240	16 0	300	20 0	360	24 0	60	4 0	60	4.000

Multiply degrees, minutes, and seconds of arc separately by 4; the products will be minutes, seconds, and sixtieths of seconds of time.

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TABLE XIX.—*Conversion of arc into time, and time into arc*—Continued

(Conversion of time into arc)

Hours of time into arc

Time	Arc	Time	Arc	Time	Arc	Time	Arc	Time	Arc	Time	Arc
Hours	°	Hours	°	Hours	°	Hours	°	Hours	°	Hours	°
1	15	5	75	9	135	13	195	17	255	21	315
2	30	6	90	10	150	14	210	18	270	22	330
3	45	7	105	11	165	15	225	19	285	23	345
4	60	8	120	12	180	16	240	20	300	24	360

Minutes of time into arc

m.	° ′	m.	° ′	m.	° ′
1	0 15	21	5 15	41	10 15
2	0 30	22	5 30	42	10 30
3	0 45	23	5 45	43	10 45
4	1 0	24	6 0	44	11 0
5	1 15	25	6 15	45	11 15
6	1 30	26	6 30	46	11 30
7	1 45	27	6 45	47	11 45
8	2 0	28	7 0	48	12 0
9	2 15	29	7 15	49	12 15
10	2 30	30	7 30	50	12 30
11	2 45	31	7 45	51	12 45
12	3 0	32	8 0	52	13 0
13	3 15	33	8 15	53	13 15
14	3 30	34	8 30	54	13 30
15	3 45	35	8 45	55	13 45
16	4 0	36	9 0	56	14 0
17	4 15	37	9 15	57	14 15
18	4 30	38	9 30	58	14 30
19	4 45	39	9 45	59	14 45
20	5 0	40	10 0	60	15 0

Seconds of time into arc

s.	′ ″	s.	′ ″	s.	′ ″
1	0 15	21	5 15	41	10 15
2	0 30	22	5 30	42	10 30
3	0 45	23	5 45	43	10 45
4	1 0	24	6 0	44	11 0
5	1 15	25	6 15	45	11 15
6	1 30	26	6 30	46	11 30
7	1 45	27	6 45	47	11 45
8	2 0	28	7 0	48	12 0
9	2 15	29	7 15	49	12 15
10	2 30	30	7 30	50	12 30
11	2 45	31	7 45	51	12 45
12	3 0	32	8 0	52	13 0
13	3 15	33	8 15	53	13 15
14	3 30	34	8 30	54	13 30
15	3 45	35	8 45	55	13 45
16	4 0	36	9 0	56	14 0
17	4 15	37	9 15	57	14 15
18	4 30	38	9 30	58	14 30
19	4 45	39	9 45	59	14 45
20	5 0	40	10 0	60	15 0

Hundredths of a second of time into arc

Hundredths of a second of time	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
s.	″	″	″	″	″	″	″	″	″	″
0.00	0.00	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35
.10	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85
.20	3.00	3.15	3.30	3.45	3.60	3.75	3.90	4.05	4.20	4.35
.30	4.50	4.65	4.80	4.95	5.10	5.25	5.40	5.55	5.70	5.85
.40	6.00	6.15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35
.50	7.50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85
.60	9.00	9.15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35
.70	10.50	10.65	10.80	10.95	11.10	11.25	11.40	11.55	11.70	11.85
.80	12.00	12.15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35
.90	13.50	13.65	13.80	13.95	14.10	14.25	14.40	14.55	14.70	14.85

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TABLE XX

STANDARD TIME SIGNALS

1. Schedule.—The following schedule gives the hours of ending of Naval Observatory time signal transmissions in Greenwich time. Under the call letters of each radio station are listed the frequencies in kilocycles used in transmitting via those stations. 1000 kilocycles=1=megacycle. For example: 4390 kilocycles=4.39 megacycles.

Hours	NSS	NAA	NAA	NAA	NAA	NAA	NPG	NPM	NPM	NBA
0		113		9425			42.8			
1		113								
2		113	4390	9425	12630					
3		113	4390	9425	12630		(1)			
4				9425				(3)	12540	
5		113		9425						(4)
6		113		9425						
7		113		9425						
8		113	4390	9425	12630		42.8			
9		113	4390	9425	12630					
10		113	4390	9425	12630					
11		113								
12		113								
13		113		9425						
14		113		9425	12630	17370				
15		113		9425	12630	17370	(1)			
16				9425				(3)	12540	
17	17.8	113		9425			42.8			(4)
18		113								
19		113		9425						
20		113		9425	12630	17370	(2)		(3)	
21		113		9425	12630	17370				
22		113		9425	12630	17370				
23		113		9425						

NSS=U.S. Naval Radio Station, Annapolis, Md.
NAA=U.S. Naval Radio Station, Arlington, Va.
NPG=U.S. Naval Radio Station, Mare Island, Calif.
NPM=U.S. Naval Radio Station, Pearl Harbor, T. H.
NBA=U.S. Naval Radio Station, Balboa, C. Z.
NOTE 1.—42.8, 113, 9090, and 12540 kc.
NOTE 2.—42.8 and 113 kc.
NOTE 3.—113 and 9090 kc.
NOTE 4.—113, 4390, and 9250 kc.

2. Standard time.—*a.* Since the sun does not rise and set in different parts of the world simultaneously, it is evident that the various parts of the world have different solar times. In order to reduce confusion, standard time zones have been adopted. All the points in each zone use one uniform time which is generally different from their local times by not much over half an hour, and in some places is the same. In general, the times of these zones differ from Greenwich, or zero meridian time, by some whole number of hours. In the continental United States there are four time zones. Eastern Standard Time is the local time of the 75th meridian and 5 hours less advanced than Greenwich Time; Central Standard Time is the local time of the 90th meridian and 6 hours less advanced than Greenwich Time; Mountain Standard Time is the local time of the 105th meridian and 7 hours less advanced than Greenwich Time; and Pacific

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Standard Time is the local time of the 120th meridian and 8 hours less advanced than Greenwich Time. The Naval Observatory is thus able to furnish one time signal which will provide time for all zones. The signal sent out at 3 hours, Greenwich Time, serves as a 10 p. m. signal in the Eastern Zone, a 9 p. m. signal in the Central Zone, an 8 p. m. signal in the Mountain Zone, and as a 7 p. m. signal in the Pacific Zone.

b. The transmission of signals begins at 55 minutes 0 second of some hour, and continues for 5 minutes. Signals are transmitted on every second during that time, except that there is no signal on the 29th second, nor on certain seconds at the ends of the minutes, as shown in the following diagram:

Minute	Second	50	51	52	53	54	55	56	57	58	59	60
55	—	—		—	—	—	—					—
56		—	—		—	—	—					—
57		—	—	—		—	—					—
58		—	—	—	—		—					—
59		—										—

The dashes shown above indicate the seconds on which signals are transmitted. The seconds marked "60" are the zero seconds of the following minutes. All seconds from 0 to 50, inclusive, are transmitted, except the 29th second, as explained previously. The dash on the beginning of the hour (shown as 59 minutes 60 seconds above) is much longer than the others. In all cases the beginnings of the dashes indicate the beginnings of the seconds; the ends of the dashes are without significance. Note that the number of dashes sounded in the group at the end of any minute indicates the number of minutes yet to be broadcast.

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TABLE XXI

MEAN ASTRONOMIC REFRACTION, WITH CORRECTIONS

(Correction is always subtracted from apparent altitude. Table is computed for barometric pressure of 29.9 inches (759 mm), and temperature of 50° F. (+10° C.)

Apparent altitude	Mean refraction	Difference for 1′	Apparent altitude	Mean refraction	Difference for 1′	Apparent altitude	Mean refraction	Difference for 1′	Apparent altitude	Mean refraction	Difference for 1′
° ′	′ ″	″	° ′	′ ″	″	° ′	′ ″	″	° ′	′ ″	″
0 00	34 09	11.7	5 20	9 22	1.5	10 40	5 00	0.5	18 00	2 57	0.2
10	32 16	10.9	30	9 08	1.4	50	4 56	0.4	20	2 54	0.2
20	30 31	10.1	40	8 54	1.3	11 00	4 51	0.4	40	2 51	0.2
30	28 54	9.6	50	8 41	1.3	10	4 47	0.4	19 00	2 48	0.2
40	27 18	9.2	6 00	8 29	1.2	20	4 43	0.4	20	2 45	0.2
50	25 50	8.5	10	8 17	1.2	30	4 39	0.4	40	2 42	0.2
1 00	24 28	7.8	20	8 05	1.1	40	4 35	0.4	20 00	2 39	0.1
10	23 13	7.2	30	7 54	1.1	50	4 31	0.4	20	2 36	0.1
20	22 05	6.6	40	7 44	1.0	12 00	4 27	0.4	40	2 33	0.1
30	21 02	6.1	50	7 34	1.0	10	4 24	0.4	21 00	2 31	0.1
40	20 04	5.6	7 00	7 24	0.9	20	4 20	0.3	20	2 28	0.1
50	19 10	5.2	10	7 15	0.9	30	4 17	0.3	40	2 26	0.1
2 00	18 20	4.8	20	7 06	0.9	40	4 13	0.3	22 00	2 23	0.1
10	17 33	4.5	30	6 57	0.8	50	4 10	0.3	20	2 21	0.1
20	16 50	4.2	40	6 49	0.8	13 00	4 07	0.3	40	2 19	0.1
30	16 09	3.9	50	6 41	0.8	10	4 04	0.3	23 00	2 16	0.1
40	15 32	3.6	8 00	6 33	0.8	20	4 01	0.3	20	2 14	0.1
50	14 57	3.4	10	6 26	0.7	30	3 58	0.3	40	2 12	0.1
3 00	14 24	3.2	20	6 19	0.7	40	3 55	0.3	24 00	2 10	0.1
10	13 54	3.0	30	6 12	0.7	50	3 52	0.3	20	2 08	0.1
20	13 25	2.8	40	6 05	0.7	14 00	3 49	0.3	40	2 06	0.1
30	12 58	2.6	50	5 59	0.6	20	3 44	0.3	25 00	2 04	0.1
40	12 32	2.5	9 00	5 53	0.6	40	3 39	0.2	20	2 02	0.1
50	12 09	2.3	10	5 47	0.6	15 00	3 34	0.2	40	2 01	0.1
4 00	11 46	2.2	20	5 41	0.6	20	3 29	0.2	26 00	1 59	0.1
10	11 25	2.1	30	5 35	0.6	40	3 25	0.2	20	1 57	0.1
20	11 04	2.0	40	5 30	0.5	16 00	3 20	0.2	40	1 55	0.1
30	10 45	1.9	50	5 24	0.5	20	3 16	0.2	27 00	1 54	0.1
40	10 26	1.8	10 00	5 19	0.5	40	3 12	0.2	20	1 52	0.1
50	10 09	1.7	10	5 14	0.5	17 00	3 08	0.2	40	1 51	0.1
5 00	9 53	1.6	20	5 09	0.5	20	3 04	0.2			
10	9 37	1.5	30	5 05	0.5	40	3 01	0.2			

Apparent altitude	Mean refraction	Apparent altitude	Mean refraction	Apparent altitude	Mean refraction	Apparent altitude	Mean refraction	Apparent altitude	Mean refraction	Apparent altitude	Mean refraction
° ′	′ ″	° ′	′ ″	° ′	′ ″	° ′	′ ″	° ′	′ ″	° ′	′ ″
28 00	1 49	35 00	1 23	42 00	1 05	49 00	0 51	63 00	0 30	77 00	0 13
30	1 47	30	1 21	30	1 03	50 00	49	64 00	28	78 00	12
29 00	1 45	36 00	1 20	43 00	1 02	51 00	47	65 00	27	79 00	11
30	1 42	30	1 18	30	1 01	52 00	45	66 00	26	80 00	10
30 00	1 40	37 00	1 17	44 00	1 00	53 00	44	67 00	25	81 00	09
30	1 38	30	1 16	30	0 59	54 00	42	68 00	24	82 00	08
31 00	1 37	38 00	1 14	45 00	58	55 00	41	69 60	22	83 00	07
30	1 35	30	1 13	30	57	56 00	39	70 00	21	84 00	06
32 00	1 33	39 00	1 12	46 00	56	57 00	38	71 00	20	85 00	05
30	1 31	30	1 10	30	55	58 00	36	72 00	19	86 00	04
33 00	1 29	40 00	1 09	47 00	54	59 00	35	73 00	18	87 00	03
30	1 28	30	1 08	30	53	60 00	34	74 00	17	88 00	02
34 00	1 26	41 00	1 07	48 00	52	61 00	32	75 00	16	89 00	01
30	1 24	30	1 06	30	52	62 00	31	76 00	15	90 00	00

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TABLE XXI.—*Mean astronomic refraction, with corrections*—Continued

(Corrections to be applied to mean refraction for temperatures other than 50° F.)

Temperature		Correction for mean refraction of—									
F.	C.	1′	2′	3′	4′	5′	6′	7′	8′	9′	10′
°	°	″	″	″	″	″	″	″	″	″	″
0	−17.8	+06	+13	+19	+26	+32	+39	+45	+52	+58	+65
5	−15.0	06	11	17	23	28	35	40	46	52	58
10	−12.2	05	10	15	20	25	31	36	41	46	51
15	−9.4	04	09	13	17	22	26	31	35	39	44
20	−6.7	04	07	11	15	19	22	26	30	33	37
25	−3.9	+03	+06	+09	+12	+15	+18	+21	+24	+28	+31
30	−1.1	02	05	07	10	12	15	17	20	22	25
35	+1.7	02	04	05	07	09	11	13	14	16	18
40	+4.4	01	02	04	05	06	07	08	10	11	12
45	+7.2	+01	+01	+02	+02	+03	+04	+04	+05	+05	+06
50	+10.0	00	00	00	00	00	00	00	00	00	00
55	+12.8	−01	−01	−02	−02	−03	−04	−04	−05	−05	−06
60	+15.6	01	02	04	05	06	07	08	10	11	12
65	+18.3	02	03	05	07	08	10	12	13	15	17
70	+21.1	02	05	07	09	11	14	16	18	20	23
75	+23.9	03	06	08	11	14	17	20	23	25	28
80	+26.7	−03	−07	−10	−13	−16	−20	−23	−26	−30	−33
85	+29.4	04	08	11	15	19	23	27	31	34	38
90	+32.4	04	09	13	17	22	26	30	35	39	43
95	+35.0	05	10	15	19	24	29	34	39	44	48
100	+37.8	−05	−11	−16	−21	−27	−32	−37	−43	−48	−53

(Corrections to be applied to mean refraction for barometric pressures other than 29.9 inches)

To be subtracted		Correction for mean refraction of—										To be added	
Barometer		1′	2′	3′	4′	5′	6′	7′	8′	9′	10′	Barometer	
Ins.	mm.	″	″	″	″	″	″	″	″	″	″	mm.	Ins.
28.4	721	03	06	09	12	15	18	21	24	28	31	----------	----------
.5	724	03	06	08	11	14	17	20	23	25	28	----------	----------
.6	726	03	05	08	11	13	16	18	21	24	26	----------	----------
.7	729	02	05	07	10	12	15	17	20	22	25	----------	----------
.8	732	02	04	07	09	11	13	16	18	20	22	787	31.0
.9	734	02	04	06	08	10	12	14	16	18	20	785	30.9
29.0	737	02	04	05	07	09	11	13	14	16	18	782	.8
.1	739	02	03	05	06	08	10	11	13	15	16	780	.7
.2	742	01	03	04	06	07	09	10	11	13	14	777	.6
.3	744	01	02	04	05	06	08	09	10	11	12	775	.5
.4	747	01		03	04	05	06	07	08	09	10	772	30.4
29.5	749	01	02	03	03	04	05	06	07	08	08	770	.3
.6	752	01	01	02	03	03	04	05	05	06	07	767	.2
.7	754	00	01	01	02	02	03	03	04	04	05	765	.1
.8	757	00	00	01	01	01	01	02	02	02	02	762	30.0
.9	759	00	00	00	00	00	00	00	00	00	00	759	29.9

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TABLE XXII
PARALLAX AND ALTITUDE OF THE SUN

Altitude	Parallax	Altitude	Parallax
°	″	°	″
0	9	50	6
5	9	55	5
10	9	60	4
15	8	65	4
20	8	70	3
25	8	75	2
30	8	80	2
35	7	85	1
40	7	90	0
45	6		

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TABLE XXIII

CONVERSION OF MEAN TIME TO SIDEREAL TIME

s	m 0	m 1	m 2	m 3				
0	h m s 0 0 0	h m s 6 5 15	h m s 12 10 29	h m s 18 15 44	s 0.00	m s 0 0	s 0.50	m s 3 3
1	0 6 5	6 11 20	12 16 34	18 21 49	0.01	0 4	0.51	3 6
2	0 12 10	6 17 25	12 22 40	18 27 54	0.02	0 7	0.52	3 10
3	0 18 16	6 23 30	12 28 45	18 33 59	0.03	0 11	0.53	3 14
4	0 24 21	6 29 36	12 34 50	18 40 5	0.04	0 15	0.54	3 17
5	0 30 26	6 35 41	12 40 55	18 46 10	0.05	0 18	0.55	3 21
6	0 36 31	6 41 46	12 47 1	18 52 15	0.06	0 22	0.56	3 25
7	0 42 37	6 47 51	12 53 6	18 58 20	0.07	0 26	0.57	3 28
8	0 48 42	6 53 56	12 59 11	19 4 26	0.08	0 29	0.58	3 32
9	0 54 47	7 0 2	13 5 16	19 10 31	0.09	0 33	0.59	3 35
10	1 0 52	7 6 7	13 11 21	19 16 36	0.10	0 37	0.60	3 39
11	1 6 58	7 12 12	13 17 27	19 22 41	0.11	0 40	0.61	3 43
12	1 13 3	7 18 17	13 23 32	19 28 47	0.12	0 44	0.62	3 46
13	1 19 8	7 24 23	13 29 37	19 34 52	0.13	0 47	0.63	3 50
14	1 25 13	7 30 28	13 35 42	19 40 57	0.14	0 51	0.64	3 54
15	1 31 19	7 36 33	13 41 48	19 47 2	0.15	0 55	0.65	3 57
16	1 37 24	7 42 38	13 47 53	19 53 7	0.16	0 58	0.66	4 1
17	1 43 29	7 48 44	13 53 58	19 59 13	0.17	1 2	0.67	4 5
18	1 49 34	7 54 49	14 0 3	20 5 18	0.18	1 6	0.68	4 8
19	1 55 40	8 0 54	14 6 9	20 11 23	0.19	1 9	0.69	4 12
20	2 1 45	8 6 59	14 12 14	20 17 28	0.20	1 13	0.70	4 16
21	2 7 50	8 13 5	14 18 19	20 23 34	0.21	1 17	0.71	4 19
22	2 13 55	8 19 10	14 24 24	20 29 39	0.22	1 20	0.72	4 23
23	2 20 1	8 25 15	14 30 30	20 35 44	0.23	1 24	0.73	4 27
24	2 26 6	8 31 20	14 36 35	20 41 49	0.24	1 28	0.74	4 30
25	2 32 11	8 37 26	14 42 40	20 47 55	0.25	1 31	0.75	4 34
26	2 38 16	8 43 31	14 48 45	20 54 0	0.26	1 35	0.76	4 38
27	2 44 22	8 49 36	14 54 51	21 0 5	0.27	1 39	0.77	4 41
28	2 50 27	8 55 41	15 0 56	21 6 10	0.28	1 42	0.78	4 45
29	2 56 32	9 1 47	15 7 1	21 12 16	0.29	1 46	0.79	4 49
30	3 2 37	9 7 52	15 13 6	21 18 21	0.30	1 50	0.80	4 52
31	3 8 43	9 13 57	15 19 12	21 24 26	0.31	1 53	0.81	4 56
32	3 14 48	9 20 2	15 25 17	21 30 31	0.32	1 57	0.82	4 59
33	3 20 53	9 26 8	15 31 22	21 36 37	0.33	2 1	0.83	5 3
34	3 26 58	9 32 13	15 37 27	21 42 42	0.34	2 4	0.84	5 7
35	3 33 3	9 38 18	15 43 33	21 48 47	0.35	2 8	0.85	5 10
36	3 39 9	9 44 23	15 49 38	21 54 52	0.36	2 11	0.86	5 14
37	3 45 14	9 50 28	15 55 43	22 0 58	0.37	2 15	0.87	5 18
38	3 51 19	9 56 34	16 1 48	22 7 3	0.38	2 19	0.88	5 21
39	3 57 24	10 2 39	16 7 54	22 13 8	0.39	2 22	0.89	5 25
40	4 3 30	10 8 44	16 13 59	22 19 13	0.40	2 26	0.90	5 29
41	4 9 35	10 14 49	16 20 4	22 25 19	0.41	2 30	0.91	5 32
42	4 15 40	10 20 55	16 26 9	22 31 24	0.42	2 33	0.92	5 36
43	4 21 45	10 27 0	16 32 14	22 37 29	0.43	2 37	0.93	5 40
44	4 27 51	10 33 5	16 38 20	22 43 34	0.44	2 41	0.94	5 43
45	4 33 56	10 39 10	16 44 25	22 49 39	0.45	2 44	0.95	5 47
46	4 40 1	10 45 16	16 50 30	22 55 45	0.46	2 48	0.96	5 51
47	4 46 6	10 51 21	16 56 35	23 1 50	0.47	2 52	0.97	5 54
48	4 52 12	10 57 26	17 2 41	23 7 55	0.48	2 55	0.98	5 58
49	4 58 17	11 3 31	17 8 46	23 14 0	0.49	2 59	0.99	6 2
50	5 4 22	11 9 37	17 14 51	23 20 6	0.50	3 3	1.00	6 5
51	5 10 27	11 15 42	17 20 56	23 26 11				
52	5 16 33	11 21 47	17 27 2	23 32 16				
53	5 22 38	11 27 52	17 33 7	23 38 21				
54	5 28 43	11 33 58	17 39 12	23 44 27				
55	5 34 48	11 40 3	17 45 17	23 50 32				
56	5 40 54	11 46 8	17 51 23	23 56 37				
57	5 46 59	11 52 13	17 57 28	24 2 42				
58	5 53 4	11 58 19	18 3 33	24 8 48				
59	5 59 9	12 4 24	18 9 38	24 14 53				
60	6 5 15	12 10 29	18 15 44	24 20 58				

Example: Let the given mean time be $14^h\ 57^m\ 32^s.56$.

The table gives

first for	$14^h\ 54^m\ 51^s$	$2^m 27^s$
then for	2 41.56	0.44
		2 27.44

The sum $14^h\ 57^m\ 32^s.56 + 2^m\ 27^s.44 = 15^h\ 0^m\ 0^s$ is the required sidereal time.

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TABLE XXIV

CONVERSION OF SIDEREAL TIME TO MEAN TIME

s	m 0		m 1		m 2		m 3					
0	h m s 0 0 0		h m s 6 6 15		h m s 12 12 29		h m s 18 18 44		s 0.00	m s 0 0	s 0.50	m s 3 3
1	0 6 6		6 12 21		12 18 35		18 24 50		0.01	0 4	0.51	3 7
2	0 12 12		6 18 27		12 24 42		18 30 56		0.02	0 7	0.52	3 10
3	0 18 19		6 24 33		12 30 48		18 37 2		0.03	0 11	0.53	3 14
4	0 24 25		6 30 40		12 36 54		18 43 9		0.04	0 15	0.54	3 18
5	0 30 31		6 36 46		12 43 0		18 49 15		0.05	0 18	0.55	3 21
6	0 36 37		6 42 52		12 49 7		18 55 21		0.06	0 22	0.56	3 25
7	0 42 44		6 48 58		12 55 13		19 1 27		0.07	0 26	0.57	3 29
8	0 48 50		6 55 4		13 1 19		19 7 34		0.08	0 29	0.58	3 32
9	0 54 56		7 1 11		13 7 25		19 13 40		0.09	0 33	0.59	3 36
10	1 1 2		7 7 17		13 13 31		19 19 46		0.10	0 37	0.60	3 40
11	1 7 9		7 13 23		13 19 38		19 25 52		0.11	0 40	0.61	3 43
12	1 13 15		7 19 29		13 25 44		19 31 59		0.12	0 44	0.62	3 47
13	1 19 21		7 25 36		13 31 50		19 38 5		0.13	0 48	0.63	3 51
14	1 25 27		7 31 42		13 37 56		19 44 11		0.14	0 51	0.64	3 54
15	1 31 34		7 37 48		13 44 3		19 50 17		0.15	0 55	0.65	3 58
16	1 37 40		7 43 54		13 50 9		19 56 23		0.16	0 59	0.66	4 2
17	1 43 46		7 50 1		13 56 15		20 2 30		0.17	1 2	0.67	4 5
18	1 49 52		7 56 7		14 2 21		20 8 36		0.18	1 6	0.68	4 9
19	1 55 59		8 2 13		14 8 28		20 14 42		0.19	1 10	0.69	4 13
20	2 2 5		8 8 19		14 14 34		20 20 48		0.20	1 13	0.70	4 16
21	2 8 11		8 14 26		14 20 40		20 26 55		0.21	1 17	0.71	4 20
22	2 14 17		8 20 32		14 26 46		20 33 1		0.22	1 21	0.72	4 24
23	2 20 24		8 26 38		14 32 53		20 39 7		0.23	1 24	0.73	4 27
24	2 26 30		8 32 44		14 38 59		20 45 13		0.24	1 28	0.74	4 31
25	2 32 36		8 38 51		14 45 5		20 51 20		0.25	1 32	0.75	4 35
26	2 38 42		8 44 57		14 51 11		20 57 26		0.26	1 35	0.76	4 38
27	2 44 49		8 51 3		14 57 18		21 3 32		0.27	1 39	0.77	4 42
28	2 50 55		8 57 9		15 3 24		21 9 38		0.28	1 43	0.78	4 46
29	2 57 1		9 3 16		15 9 30		21 15 45		0.29	1 46	0.79	4 49
30	3 3 7		9 9 22		15 15 36		21 21 51		0.30	1 50	0.80	4 53
31	3 9 14		9 15 28		15 21 43		21 27 57		0.31	1 54	0.81	4 57
32	3 15 20		9 21 34		15 27 49		21 34 3		0.32	1 57	0.82	5 0
33	3 21 26		9 27 41		15 33 55		21 40 10		0.33	2 1	0.83	5 4
34	3 27 32		9 33 47		15 40 1		21 46 16		0.34	2 5	0.84	5 8
35	3 33 38		9 39 53		15 46 8		21 52 22		0.35	2 8	0.85	5 11
36	3 39 45		9 45 59		15 52 14		21 58 28		0.36	2 12	0.86	5 15
37	3 45 51		9 52 5		15 58 20		22 4 35		0.37	2 16	0.87	5 19
38	3 51 57		9 58 12		16 4 26		22 10 41		0.38	2 19	0.88	5 22
39	3 58 3		10 4 18		16 10 33		22 16 47		0.39	2 23	0.89	5 26
40	4 4 10		10 10 24		16 16 39		22 22 53		0.40	2 26	0.90	5 30
41	4 10 16		10 16 30		16 22 45		22 29 0		0.41	2 30	0.91	5 33
42	4 16 22		10 22 37		16 28 51		22 35 6		0.42	2 34	0.92	5 37
43	4 22 28		10 28 43		16 34 57		22 41 12		0.43	2 37	0.93	5 41
44	4 28 35		10 34 49		16 41 4		22 47 18		0.44	2 41	0.94	5 44
45	4 34 41		10 40 55		16 47 10		22 53 24		0.45	2 45	0.95	5 48
46	4 40 47		10 47 2		16 53 16		22 59 31		0.46	2 48	0.96	5 52
47	4 46 53		10 53 8		16 59 22		23 5 37		0.47	2 52	0.97	5 55
48	4 53 0		10 59 14		17 5 29		23 11 43		0.48	2 56	0.98	5 59
49	4 59 6		11 5 20		17 11 35		23 17 49		0.49	2 59	0.99	6 3
50	5 5 12		11 11 27		17 17 41		23 23 56		0.50	3 3	1.00	6 6
51	5 11 18		11 17 33		17 23 47		23 30 2					
52	5 17 25		11 23 39		17 29 54		23 36 8					
53	5 23 31		11 29 45		17 36 0		23 42 14					
54	5 29 37		11 35 52		17 42 6		23 48 21					
55	5 35 43		11 41 58		17 48 12		23 54 27					
56	5 41 50		11 48 4		17 54 19		24 0 33					
57	5 47 56		11 54 10		18 0 25		24 6 39					
58	5 54 2		12 0 17		18 6 31		24 12 46					
59	6 0 8		12 6 23		18 12 37		24 18 52					
60	6 6 15		12 12 29		18 18 44		24 24 58					

Example: Given $15^h\ 0^m\ 0^s$.
The table gives
first for $14^h\ 57^m\ 18^s$ $2^m\ 27^s$
then for 2 42 0.44
15 0 0 2 27.44
The difference
$15^h\ 0^m\ 0^s - 2^m\ 27^s.44 = 14^h\ 57^m\ 32^s.56$
is the required mean time.

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TABLE XXV

ARC-SIN CORRECTIONS FOR INVERSE POSITION COMPUTATIONS

log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$	log s_1	Arc-sin correction in units of seventh decimal of logarithms	log $\Delta\phi$ or log $\Delta\lambda$
4.177	1	2.686	5.223	124	3.732
4.327	2	2.836	5.234	130	3.743
4.415	3	2.924	5.243	136	3.752
4.478	4	2.987	5.253	142	3.762
4.526	5	3.035	5.260	147	3.769
4.566	6	3.075	5.269	153	3.778
4.599	7	3.108	5.279	160	3.788
4.628	8	3.137	5.287	166	3.796
4.654	9	3.163	5.294	172	3.803
4.677	10	3.186	5.303	179	3.812
4.697	11	3.206	5.311	186	3.820
4.716	12	3.225	5.318	192	3.827
4.734	13	3.243	5.326	199	3.835
4.750	14	3.259	5.334	206	3.843
4.765	15	3.274	5.341	213	3.850
4.779	16	3.288	5.349	221	3.858
4.792	17	3.301	5.356	228	3.865
4.804	18	3.313	5.363	236	3.872
4.827	20	3.336	5.369	243	3.878
4.857	23	3.366	5.376	251	3.885
4.876	25	3.385	5.383	259	3.892
4.892	27	3.401	5.390	267	3.899
4.915	30	3.424	5.396	275	3.905
4.936	33	3.445	5.403	284	3.912
4.955	36	3.464	5.409	292	3.918
4.972	39	3.481	5.415	300	3.924
4.988	42	3.497	5.422	309	3.931
5.003	45	3.512	5.428	318	3.937
5.017	48	3.526	5.434	327	3.943
5.035	52	3.544	5.440	336	3.949
5.051	56	3.560	5.446	345	3.955
5.062	59	3.571	5.451	354	3.960
5.076	63	3.585	5.457	364	3.966
5.090	67	3.599	5.462	373	3.971
5.102	71	3.611	5.468	383	3.977
5.114	75	3.623	5.473	392	3.982
5.128	80	3.637	5.479	402	3.988
5.139	84	3.648	5.484	412	3.993
5.151	89	3.660	5.489	422	3.998
5.163	94	3.672	5.495	433	4.004
5.172	98	3.681	5.500	443	4.009
5.183	103	3.692	5.505	453	4.014
5.193	108	3.702	5.510	464	4.019
5.205	114	3.714	5.515	474	4.024
5.214	119	3.723	5.520	486	4.029

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TABLE XXVI

CONVERSION OF DEGREES CENTIGRADE TO DEGREES FAHRENHEIT, AND DEGREES FAHRENHEIT TO DEGREES CENTIGRADE

$$^\circ F. = 9/5\ ^\circ C. + 32 \qquad ^\circ C = \frac{5(^\circ F - 32)}{9}$$

° C.	° F.	° C.	° F.	° C.	° F.	° C.	° F.	° C.	° F.
0	32.0	10	50.0	20	68.0	30	86.0	40	104.0
1	33.8	11	51.8	21	69.8	31	87.8	41	105.8
2	35.6	12	53.6	22	71.6	32	89.6	42	107.6
3	37.4	13	55.4	23	73.4	33	91.4	43	109.4
4	39.2	14	57.2	24	75.2	34	93.2	44	111.2
5	41.0	15	59.0	25	77.0	35	95.0	45	113.0
6	42.8	16	60.8	26	78.8	36	96.8	46	114.8
7	44.6	17	62.6	27	80.6	37	98.6	47	116.6
8	46.4	18	64.4	28	82.4	38	100.4	48	118.4
9	48.2	19	66.2	29	84.2	39	102.2	49	120.2

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TABLE XXVII

COMMON LOGARITHMS OF VERSED SINES AND EXTERNAL SECANTS

0°					1°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	∞		∞		0	6. 182714		6. 182780	
1	2. 626422	10034. 33	2. 626422	10034. 33	1	. 197071	239. 28	. 197139	239. 32
2	3. 228482	5869. 72	3. 228482	5869. 72	2	. 211194	235. 38	. 211264	235. 42
3	. 580665	4164. 62	. 580665	4164. 62	3	. 225091	231. 62	. 225164	231. 67
4	. 830542	3230. 33	. 830542	3230. 35	4	. 238770	227. 98	. 238845	228. 02
5	4. 024362	2639. 38	4. 024363	2639. 37	5	6. 252236	224. 43	6. 252314	224. 48
6	. 182725	2231. 55	. 182725	2231. 57	6	. 265497	221. 02	. 265577	221. 05
7	. 316618	1933. 07	. 316619	1933. 07	7	. 278558	217. 68	. 278641	217. 73
8	. 432602	1705. 08	. 432603	1705. 08	8	. 291426	214. 47	. 291511	214. 50
9	. 534907	1525. 25	. 534908	1525. 27	9	. 304106	211. 33	. 304193	211. 37
10	4. 626422	1379. 75	4. 626424	1379. 75	10	6. 316603	208. 28	6. 316693	208. 33
11	. 709207	1259. 62	. 709209	1259. 63	11	. 328923	205. 33	. 329016	205. 38
12	. 784784	1158. 73	. 784787	1158. 75	12	. 341071	202. 47	. 341167	202. 52
13	. 854308	1072. 83	. 854312	1072. 82	13	. 353052	199. 68	. 353150	199. 72
14	. 918678	998. 77	. 918681	998. 78	14	. 364869	196. 95	. 364970	197. 00
15	4. 978604	934. 28	4. 978608	934. 30	15	6. 376528	194. 32	6. 376631	194. 35
16	5. 034661	877. 63	5. 034666	877. 65	16	. 388032	191. 73	. 388138	191. 78
17	. 087319	827. 45	. 087325	827. 45	17	. 399386	189. 23	. 399494	189. 27
18	. 136966	782. 70	. 136972	782. 72	18	. 410593	186. 78	. 410705	186. 85
19	. 183928	742. 55	. 183935	742. 55	19	. 421657	184. 40	. 421772	184. 45
20	5. 228481	706. 30	5. 228488	706. 33	20	6. 432583	182. 10	6. 432700	182. 13
21	. 270859	673. 45	. 270868	673. 45	21	. 443372	179. 82	. 443493	179. 88
22	. 311266	643. 50	. 311275	643. 52	22	. 454029	177. 62	. 454153	177. 67
23	. 349876	616. 12	. 349886	616. 13	23	. 464557	175. 47	. 464684	175. 52
24	. 386843	590. 95	. 386854	590. 97	24	. 474959	173. 37	. 475089	173. 42
25	5. 422300	567. 78	5. 422312	567. 78	25	6. 485238	171. 32	6. 485371	171. 37
26	. 456367	546. 35	. 456379	546. 37	26	. 495396	169. 30	. 495532	169. 35
27	. 489148	526. 47	. 489161	526. 48	27	. 505438	167. 37	. 505577	167. 42
28	. 520736	508. 00	. 520750	508. 02	28	. 515364	165. 43	. 515506	165. 48
29	. 551216	490. 77	. 551231	490. 80	29	. 525178	163. 57	. 525324	163. 63
30	5. 580662	474. 68	5. 580679	474. 68	30	6. 534882	161. 73	6. 535031	161. 78
31	. 609143	459. 60	. 609160	459. 63	31	. 544480	159. 97	. 544632	160. 02
32	. 636719	445. 47	. 636738	445. 48	32	. 553972	158. 20	. 554128	158. 27
33	. 663447	432. 17	. 663467	432. 18	33	. 563362	156. 50	. 563521	156. 55
34	. 689377	419. 63	. 689398	419. 65	34	. 572651	154. 82	. 572813	154. 87
35	5. 714555	407. 80	5. 714577	407. 83	35	6. 581842	153. 18	6. 582008	153. 25
36	. 739023	396. 63	. 739047	396. 67	36	. 590936	151. 57	. 591106	151. 63
37	. 762821	386. 07	. 762847	386. 08	37	. 599937	150. 02	. 600110	150. 07
38	. 785985	376. 03	. 786012	376. 05	38	. 608845	148. 47	. 609021	148. 52
39	. 808547	366. 50	. 808575	366. 53	39	. 617663	146. 97	. 617843	147. 03
40	5. 830537	357. 47	5. 830567	357. 48	40	6. 626392	145. 48	6. 626575	145. 53
41	. 851985	348. 83	. 852016	348. 87	41	. 635034	144. 03	. 635221	144. 10
42	. 872915	340. 63	. 872948	340. 65	42	. 643591	142. 62	. 643782	142. 68
43	. 893353	332. 82	. 893387	332. 83	43	. 652064	141. 22	. 652259	141. 28
44	. 913322	325. 32	. 913357	325. 35	44	. 660456	139. 87	. 660655	139. 93
45	5. 932841	318. 17	5. 932878	318. 20	45	6. 668767	138. 52	6. 668970	138. 58
46	. 951931	311. 33	. 951970	311. 37	46	. 677000	137. 22	. 677206	137. 27
47	. 970611	304. 78	. 970652	304. 80	47	. 685155	135. 92	. 685365	135. 97
48	. 988898	298. 48	. 988940	298. 52	48	. 693234	134. 65	. 693448	134. 72
49	6. 006807	292. 47	6. 006851	292. 50	49	. 701239	133. 42	. 701457	133. 48
50	6. 024355	286. 67	6. 024401	286. 68	50	6. 709171	132. 20	6. 709393	132. 27
51	. 041555	281. 10	. 041602	281. 13	51	. 717030	130. 98	. 717257	131. 07
52	. 058421	275. 73	. 058470	275. 78	52	. 724820	129. 82	. 725050	129. 88
53	. 074965	270. 60	. 075017	270. 62	53	. 732540	128. 67	. 732775	128. 75
54	. 091201	265. 62	. 091254	265. 67	54	. 740192	127. 53	. 740431	127. 60
55	6. 107138	260. 85	6. 107194	260. 87	55	6. 747777	126. 42	6. 748020	126. 48
56	. 122789	256. 22	. 122846	256. 27	56	. 755297	125. 33	. 755544	125. 40
57	. 138162	251. 77	. 138222	251. 80	57	. 762752	124. 25	. 763004	124. 33
58	. 153268	247. 47	. 153330	247. 50	58	. 770144	123. 20	. 770400	123. 27
59	. 168116	243. 30	. 168180	243. 33	59	. 777473	122. 15	. 777733	122. 22
60	6. 182714		6. 182780		60	6. 784741	121. 13	6. 785005	121. 20

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

2°					3°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″
0	6.784741	120.12	6.785005	120.20	0	7.136868	80.18	7.137464	80.28
1	.791948	119.13	.792217	119.22	1	.141679	79.75	.142281	79.85
2	.799096	118.17	.799370	118.23	2	.146464	79.30	.147072	79.42
3	.806186	117.22	.806464	117.28	3	151222	78.87	.151837	79.00
4	.813219	116.25	.813501	116.35	4	.155954	78.45	.156577	78.55
5	6.820194	115.35	6.820482	115.40	5	7.160661	78.02	7.161290	78.13
6	.827115	114.42	.827406	114.52	6	.165342	77.60	.165978	77.72
7	.833980	113.53	.834277	113.60	7	.169998	77.20	.170641	77.30
8	.840792	112.65	.841093	112.73	8	.174630	76.77	.175279	76.90
9	.847551	111.77	.847857	111.85	9	.179236	76.38	.179893	76.50
10	6.854257	110.92	6.854568	111.00	10	7.183819	75.97	7.184483	76.08
11	.860912	110.08	.861228	110.15	11	.188377	75.58	.189048	75.68
12	.867517	109.23	.867837	109.32	12	.192912	75.18	.193589	75.32
13	.874071	108.43	.874396	108.52	13	.197423	74.78	.198108	74.90
14	.880577	107.62	.880907	107.70	14	.201910	74.42	.202602	74.53
15	6.887034	106.82	6.887369	106.90	15	7.206375	74.03	7.207074	74.15
16	.893443	106.05	.893783	106.13	16	.210817	73.65	.211523	73.77
17	.899806	105.27	.900151	105.35	17	.215236	73.28	.215949	73.40
18	.906122	104.52	906472	104.60	18	.219633	72.90	.220353	73.03
19	.912393	103.75	.912748	103.85	19	.224007	72.55	.224735	72.67
20	6.918618	103.03	6.918979	103.10	20	7.228360	72.18	7.229095	72.30
21	.924800	102.28	.925165	102.38	21	.232691	71.82	.233433	71.95
22	.930937	101.58	.931308	101.67	22	.237000	71.47	.237750	71.60
23	.937032	100.87	.937408	100.95	23	.241288	71.12	.242046	71.23
24	.943084	100.17	.943465	100.25	24	.245555	70.77	246320	70.90
25	6.949094	99.48	6.949480	99.57	25	7.249801	70.43	7.250574	70.55
26	.955063	98.80	.955454	98.90	26	.254027	70.08	.254807	70.20
27	.960991	98.13	.961388	98.22	27	.258232	69.73	.259019	69.88
28	.966879	97.47	.967281	97.57	28	.262416	69.42	.263212	69.53
29	.972727	96.82	.973135	96.90	29	.266581	69.08	.267384	69.22
30	6.978536	96.17	6.978949	96.27	30	7.270726	68.75	7.271537	68.87
31	.984306	95.55	.984725	95.63	31	.274851	68.42	.275669	68.57
32	.990039	94.90	.990463	95.02	32	.278956	68.12	.279783	68.23
33	.995733	94.30	.996164	94.38	33	.283043	67.78	.283877	67.92
34	7.001391	93.68	7.001827	93.78	34	.287110	67.47	.287952	67.58
35	7.007012	93.08	7.007454	93.17	35	7.291158	67.15	7.292007	67.30
36	.012597	92.48	.013044	92.58	36	.295187	66.83	.296045	66.97
37	.018146	91.90	.018599	92.00	37	.299197	66.55	.300063	66.67
38	.023660	91.32	.024119	91.42	38	.303190	66.23	.304063	66.37
39	.029139	90.75	.029604	90.83	39	.307164	65.92	.308045	66.07
40	7.034584	90.18	7.035054	90.28	40	7.311119	65.63	7.312009	65.77
41	.039995	89.62	.040471	89.72	41	.315057	65.33	.315955	65.47
42	.045372	89.07	.045854	89.17	42	.318977	65.05	.319883	65.18
43	.050716	88.53	.051204	88.63	43	.322880	64.75	.323794	64.88
44	.056028	87.98	.056522	88.08	44	.326765	64.45	.327687	64.60
45	7.061307	87.45	7.061807	87.57	45	7.330632	64.18	7.331563	64.32
46	.066554	86.93	.067061	87.02	46	.334483	63.88	.335422	64.03
47	.071770	86.40	.072282	86.52	47	.338316	63.62	.339264	63.75
48	.076954	85.90	.077473	86.00	48	.342133	63.33	.343089	63.47
49	.082108	85.40	.082633	85.50	49	.345933	63.05	.346897	63.20
50	7.087232	84.88	7.087763	84.98	50	7.349716	62.78	7.350689	62.92
51	.092325	84.40	.092862	84.50	51	.353483	62.50	.354464	62.65
52	.097389	83.90	.097932	84.02	52	.357233	62.25	.358223	62.38
53	.102423	83.42	.102973	83.53	53	.360968	61.97	.361966	62.12
54	.107428	82.95	.107985	83.05	54	.364686	61.72	.365693	61.85
55	7.112405	82.47	7.112968	82.57	55	7.368389	61.45	7.369404	61.60
56	.117353	82.00	.117922	82.12	56	.372076	61.18	.373100	61.33
57	.122273	81.53	.122849	81.65	57	.375747	60.93	.376780	61.07
58	.127165	81.08	.127748	81.18	58	.379403	60.67	.380444	60.83
59	.132030	80.63	.132619	80.75	59	.383043	60.42	.384094	60.57
60	7.136868		7.137464		60	7.386668		7.387728	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—(

	4°					5°			
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	7.386668	60.17	7.387728	60.32	0	7.580389	48.15	7.582045	48.33
1	.390278	59.93	.391347	60.07	1	.583278	47.98	.584945	48.17
2	.393874	59.67	.394951	59.82	2	.586157	47.82	.587835	48.00
3	.397454	59.43	.398540	59.57	3	.589026	47.67	.590715	47.87
4	.401020	59.18	.402114	59.33	4	.591886	47.52	.593587	47.70
5	7.404571	58.93	7.405674	59.10	5	7.594737	47.35	7.596449	47.53
6	.408107	58.70	.409220	58.85	6	.597578	47.20	.599301	47.38
7	.411629	58.47	.412751	58.62	7	.600410	47.05	.602144	47.25
8	.415137	58.23	.416268	58.38	8	.603233	46.90	.604979	47.08
9	.418631	58.00	.419771	58.15	9	.606047	46.73	.607804	46.92
10	7.422111	57.77	7.423260	57.92	10	7.608851	46.60	7.610619	46.78
11	.425577	57.53	.426735	57.70	11	.611647	46.43	.613426	46.63
12	.429029	57.30	.430197	57.45	12	.614433	46.30	.616224	46.48
13	.432467	57.08	.433644	57.25	13	.617211	46.15	.619013	46.35
14	.435892	56.85	.437079	57.00	14	.619980	45.98	.621794	46.18
15	7.439303	56.63	7.440499	56.80	15	7.622739	45.87	7.624565	46.05
16	.442701	56.42	.443907	56.57	16	.625491	45.70	.627328	45.90
17	.446086	56.20	.447301	56.35	17	.628233	45.57	.630082	45.75
18	.449458	55.97	.450682	56.13	18	.630967	45.42	.632827	45.62
19	.452816	55.77	.454050	55.92	19	.633692	45.28	.635564	45.48
20	7.456162	55.55	7.457405	55.72	20	7.636409	45.13	7.638293	45.33
21	.459495	55.33	.460748	55.48	21	.639117	44.98	.641013	45.18
22	.462815	55.12	.464077	55.28	22	.641816	44.87	.643724	45.07
23	.466122	54.92	.467394	55.08	23	.644508	44.72	.646428	44.90
24	.469417	54.70	.470699	54.87	24	.647191	44.57	.649122	44.78
25	7.472699	54.50	7.473991	54.65	25	7.649865	44.45	7.651809	44.65
26	.475969	54.28	.477270	54.47	26	.652532	44.30	.654488	44.50
27	.479226	54.10	.480538	54.25	27	.655190	44.17	.657158	44.37
28	.482472	53.88	.483793	54.05	28	.657840	44.05	.569820	44.23
29	.485705	53.70	.487036	53.85	29	.660483	43.90	.662474	44.12
30	7.488927	53.48	7.490267	53.67	30	7.663117	43.77	7.665121	43.97
31	.492136	53.28	.493487	53.45	31	.665743	43.63	.667759	43.83
32	.495333	53.10	.496694	53.27	32	.668361	43.50	.670389	43.72
33	.498519	52.90	.499890	53.07	33	.670971	43.38	.673012	43.57
34	.501693	52.72	.503074	52.88	34	.673574	43.23	.675626	43.45
35	7.504856	52.52	7.506247	52.68	35	7.676168	43.12	7.678233	43.33
36	.508007	52.33	.509408	52.50	36	.678755	42.98	.680833	43.18
37	.511147	52.13	.512558	52.32	37	.681334	42.87	.683424	43.07
38	.514275	51.95	.515697	52.12	38	.683906	42.73	.686008	42.95
39	.517392	51.77	.518824	51.93	39	.686470	42.60	.688585	42.82
40	7.520498	51.58	7.521940	51.77	40	7.689026	42.48	7.691154	42.68
41	.523593	51.40	.525046	51.57	41	.691575	42.35	.693715	42.57
42	.526677	51.22	.528140	51.38	42	.694116	42.23	.696269	42.43
43	.529750	51.03	.531223	51.22	43	.696650	42.12	.698815	42.33
44	.532812	50.85	.534296	51.02	44	.699177	41.98	.701355	42.20
45	7.535863	50.68	7.537357	50.85	45	7.701696	41.87	7.703887	42.07
46	.538904	50.50	.540408	50.68	46	.704208	41.73	.706411	41.97
47	.541934	50.32	.543449	50.50	47	.706712	41.63	.708929	41.83
48	.544953	50.15	.546479	50.33	48	.709210	41.50	.711439	41.72
49	.547962	49.98	.549499	50.15	49	.711700	41.38	.713942	41.60
50	7.550961	49.80	7.552508	49.98	50	7.714183	41.27	7.716438	41.48
51	.553949	49.63	.555507	49.80	51	.716659	41.15	.718927	41.37
52	.556927	49.47	.558495	49.65	52	.719128	41.03	.721409	41.25
53	.559895	49.28	.561474	49.47	53	.721590	40.92	.723884	41.13
54	.562852	49.13	.564442	49.32	54	.724045	40.80	.726352	41.02
55	7.565800	48.95	7.567401	49.13	55	7.726493	40.68	7.728813	40.90
56	.568737	48.80	.570349	48.98	56	.728934	40.57	.731267	40.78
57	.571665	48.63	.573288	48.82	57	.731368	40.47	.733714	40.68
58	.574583	48.47	.576217	48.65	58	.733796	40.33	.736155	40.57
59	.577491	48.30	.579136	48.48	59	.736216	40.23	.738589	40.45
60	7.580389		7.582045		60	7.738630		7.741016	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

6°					7°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	7.738630	40.13	7.741016	40.33	0	7.872381	34.38	7.875630	34.63
1	.741038	40.00	.743436	40.23	1	.874444	34.30	.877708	34.57
2	.743438	39.90	.745850	40.13	2	.876502	34.22	.879782	34.48
3	.745832	39.78	.748258	40.00	3	.878555	34.13	.881851	34.40
4	.748219	39.68	.750658	39.90	4	.880603	34.07	.883915	34.32
5	7.750600	39.57	7.753052	39.80	5	7.882647	33.98	7.885974	34.25
6	.752974	39.47	.755440	39.68	6	.884686	33.90	.888029	34.15
7	.755342	39.35	.757821	39.58	7	.886720	33.82	.890078	34.08
8	.757703	39.25	.760196	39.48	8	.888749	33.73	.892123	34.02
9	.760058	39.13	.762565	39.37	9	.890773	33.67	.894164	33.92
10	7.762406	39.05	7.764927	39.25	10	7.892793	33.58	7.896199	33.85
11	.764749	38.92	.767282	39.17	11	.894808	33.50	.898230	33.77
12	.767084	38.83	.769632	39.05	12	.896818	33.43	.900256	33.70
13	.769414	38.72	.771975	38.95	13	.898824	33.35	.902278	33.62
14	.771737	38.62	.774312	38.85	14	.900825	33.27	.904295	33.53
15	7.774054	38.52	7.776643	38.75	15	7.902821	33.20	7.906307	33.47
16	.776365	38.42	.778968	38.63	16	.904813	33.12	.908315	33.40
17	.778670	38.30	.781286	38.55	17	.906800	33.05	.910319	33.30
18	.780968	38.22	.783599	38.43	18	.908783	32.97	.912317	33.25
19	.783261	38.10	.785905	38.35	19	.910761	32.90	.914312	33.17
20	7.785547	38.02	7.788206	38.23	20	7.912735	32.82	7.916302	33.08
21	.787828	37.90	.790500	38.15	21	.914704	32.73	.918287	33.02
22	.790102	37.82	.792789	38.03	22	.916668	32.68	.920268	32.95
23	.792371	37.70	.795071	37.95	23	.918629	32.58	.922245	32.87
24	.794633	37.62	.797348	37.85	24	.920584	32.53	.924217	32.78
25	7.796890	37.52	7.799619	37.75	25	7.922536	32.45	7.926184	32.73
26	.799141	37.40	.801884	37.65	26	.924482	32.37	.928148	32.65
27	.801385	37.33	.804143	37.57	27	.926425	32.32	.930107	32.58
28	.803625	37.22	.806397	37.45	28	.928364	32.22	.932062	32.50
29	.805858	37.13	.808644	37.37	29	.930297	32.17	.934012	32.43
30	7.808086	37.03	7.810886	37.28	30	7.932227	32.08	7.935958	32.37
31	.810308	36.93	.813123	37.17	31	.934152	32.02	.937900	32.30
32	.812524	36.83	.815353	37.08	32	.936073	31.95	.939838	32.23
33	.814734	36.75	.817578	37.00	33	.937990	31.88	.941772	32.15
34	.816939	36.67	.819798	36.90	34	.939903	31.80	.943701	32.08
35	7.819139	36.55	7.822012	36.80	35	7.941811	31.73	7.945626	32.02
36	.821332	36.48	.824220	36.72	36	.943715	31.67	.947547	31.95
37	.823521	36.37	.826423	36.62	37	.945615	31.60	.949464	31.87
38	.825703	36.28	.828620	36.53	38	.947511	31.52	.951376	31.82
39	.827880	36.20	.830812	36.45	39	.949402	31.47	.953285	31.73
40	7.830052	36.10	7.832999	36.35	40	7.951290	31.38	7.955189	31.68
41	.832218	36.02	.835180	36.27	41	.953173	31.32	.957090	31.60
42	.834379	35.93	.837356	36.17	42	.955052	31.27	.958986	31.53
43	.836535	35.83	.839526	36.08	43	.956928	31.18	.960878	31.48
44	.838685	35.75	.841691	36.00	44	.958799	31.12	.962767	31.40
45	7.840830	35.65	7.843851	35.90	45	7.960666	31.05	7.964651	31.33
46	.842969	35.58	.846005	35.83	46	.962529	30.98	.966531	31.28
47	.845104	35.48	.848155	35.73	47	.964388	30.92	.968408	31.20
48	.847233	35.40	.850299	35.63	48	.966243	30.85	.970280	31.13
49	.849357	35.30	.852437	35.57	49	.968094	30.78	.972148	31.08
50	7.851475	35.23	7.854571	35.48	50	7.969941	30.73	7.974013	31.02
51	.853589	35.13	.856700	35.38	51	.971785	30.65	.975874	30.93
52	.855697	35.05	.858823	35.32	52	.973624	30.58	.977730	30.88
53	.857800	34.97	.860942	35.22	53	.975459	30.53	.979583	30.82
54	.859898	34.88	.863055	35.13	54	.977291	30.45	.981432	30.75
55	7.861991	34.80	7.865163	35.05	55	7.979118	30.40	7.983277	30.70
56	.864079	34.72	.867266	34.98	56	.980942	30.33	.985119	30.62
57	.866162	34.63	.869365	34.88	57	.982762	30.27	.986956	30.57
58	.868240	34.55	.871458	34.80	58	.984578	30.22	.988790	30.50
59	.870313	34.47	.873546	34.73	59	.986391	30.13	.990620	30.43
60	7.872381		7.875630		60	7.988199		7.992446	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

8°					9°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	7.988199	30.08	7.992446	30.38	0	8.090317	26.72	8.095697	27.05
1	.990004	30.02	.994269	30.32	1	.091920	26.68	.097320	27.02
2	.991805	29.95	.996088	30.25	2	.093521	26.63	.098941	26.97
3	.993602	29.88	.997903	30.18	3	.095119	26.58	.100559	26.92
4	.995395	29.83	.999714	30.13	4	.096714	26.52	.102174	26.87
5	7.997185	29.77	8.001522	30.07	5	8.098305	26.48	8.103786	26.82
6	.998971	29.72	.003326	30.00	6	.099894	26.43	.105395	26.77
7	8.000754	29.63	.005126	29.95	7	.101480	26.40	.107001	26.73
8	.002532	29.60	.006923	29.88	8	.103064	26.33	.108605	26.67
9	.004308	29.52	.008716	29.83	9	.104644	26.28	.110205	26.63
10	8.006079	29.47	8.010506	29.77	10	8.106221	26.25	8.111803	26.58
11	.007847	29.40	.012292	29.70	11	.107796	26.18	.113398	26.53
12	.009611	29.35	.014074	29.65	12	.109367	26.15	.114990	26.48
13	.011372	29.28	.015853	29.58	13	.110936	26.10	.116579	26.45
14	.013129	29.22	.017628	29.53	14	.112502	26.05	.118166	26.38
15	8.014882	29.17	8.019400	29.47	15	8.114065	26.00	8.119749	26.35
16	.016632	29.10	.021168	29.42	16	.115625	25.95	.121330	26.30
17	.018378	29.05	.022933	29.35	17	.117182	25.92	.122908	26.25
18	.020121	29.00	.024694	29.30	18	.118737	25.87	.124483	26.22
19	.021861	28.93	.026452	29.23	19	.120289	25.82	.126056	26.17
20	8.023597	28.87	8.028206	29.18	20	8.121838	25.77	8.127626	26.12
21	.025329	28.82	.029957	29.13	21	.123384	25.72	.129193	26.07
22	.027058	28.75	.031705	29.07	22	.124927	25.68	.130757	26.02
23	.028783	28.70	.033449	29.00	23	.126468	25.63	.132318	25.98
24	.030505	28.65	.035189	28.97	24	.128006	25.58	.133877	25.93
25	8.032224	28.58	8.036927	28.90	25	8.129541	25.55	8.135433	25.90
26	.033939	28.53	.038661	28.83	26	.131074	25.50	.136987	25.85
27	.035651	28.47	.040391	28.78	27	.132604	25.45	.138538	25.80
28	.037359	28.42	.042118	28.73	28	.134131	25.40	.140086	25.75
29	.039064	28.37	.043842	28.68	29	.135655	25.37	.141631	25.72
30	8.040766	28.30	8.045563	28.62	30	8.137177	25.32	8.143174	25.67
31	.042464	28.25	.047280	28.57	31	.138696	25.27	.144714	25.63
32	.044159	28.20	.048994	28.50	32	.140212	25.23	.146252	25.58
33	.045851	28.13	.050704	28.47	33	.141726	25.18	.147787	25.53
34	.047539	28.08	.052412	28.40	34	.143237	25.13	.149319	25.50
35	8.049224	28.03	8.054116	28.35	35	8.144745	25.10	8.150849	25.45
36	.050906	27.98	.055817	28.28	36	.146251	25.05	.152376	25.40
37	.052585	27.92	.057514	28.25	37	.147754	25.02	.153900	25.37
38	.054260	27.87	.059209	28.18	38	.149255	24.95	.155422	25.33
39	.055932	27.82	.060900	28.13	39	.150752	24.93	.156942	25.27
40	8.057601	27.75	8.062588	28.08	40	8.152248	24.88	8.158458	25.25
41	.059266	27.72	.064273	28.03	41	.153741	24.83	.159973	25.18
42	.060929	27.65	.065955	27.97	42	.155231	24.78	.161484	25.17
43	.062588	27.60	.067633	27.93	43	.156718	24.75	.162994	25.10
44	.064244	27.55	.069309	27.87	44	.158203	24.72	.164500	25.07
45	8.065897	27.48	8.070981	27.82	45	8.159686	24.67	8.166004	25.03
46	.067546	27.45	.072650	27.77	46	.161166	24.62	.167506	24.98
47	.069193	27.38	.074316	27.72	47	.162643	24.58	.169005	24.95
48	.070836	27.33	.075979	27.67	48	.164118	24.53	.170502	24.90
49	.072476	27.30	.077639	27.60	49	.165590	24.50	.171996	24.87
50	8.074114	27.23	8.079295	27.57	50	8.167060	24.45	8.173488	24.82
51	.075748	27.18	.080949	27.52	51	.168527	24.42	.174977	24.78
52	.077379	27.13	.082600	27.45	52	.169992	24.37	.176464	24.73
53	.079007	27.07	.084247	27.42	53	.171454	24.33	.177948	24.70
54	.080631	27.03	.085892	27.37	54	.172914	24.30	.179430	24.65
55	8.082253	26.98	8.087534	27.30	55	8.174372	24.25	8.180909	24.62
56	.083872	26.93	.089172	27.27	56	.175827	24.20	.182386	24.58
57	.085488	26.87	.090808	27.20	57	.177279	24.17	.183861	24.53
58	.087100	26.83	.092440	27.17	58	.178729	24.13	.185333	24.50
59	.088710	26.78	.094070	27.12	59	.180177	24.08	.186803	24.47
60	8.090317		8.095697		60	8.181622		8.188271	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

10°					11°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8. 181622		8. 188271		0	8. 264176		8. 272229	
1	. 183065	24. 05	. 189736	24. 42	1	. 265487	21. 85	. 273565	22. 27
2	. 184505	24. 00	. 191198	24. 37	2	. 266796	21. 82	. 274898	22. 22
3	. 185943	23. 97	. 192659	24. 35	3	. 268103	21. 78	. 276230	22. 20
4	. 187379	23. 93	. 194117	24. 30	4	. 269408	21. 75	. 277560	22. 17
5	8. 188812	23. 88	8. 195572	24. 25	5	8. 270711	21. 72	8. 278888	22. 13
6	. 190243	23. 85	. 197025	24. 22	6	. 272012	21. 68	. 280213	22. 08
7	. 191671	23. 80	. 198476	24. 18	7	. 273311	21. 65	. 281537	22. 07
8	. 193097	23. 77	. 199925	24. 15	8	. 274608	21. 62	. 282859	22. 03
9	. 194521	23. 73	. 201371	24. 10	9	. 275903	21. 58	. 284179	22. 00
10	8. 195942	23. 68	8. 202815	24. 07	10	8. 277197	21. 57	8. 285498	21. 98
11	. 197361	23. 65	. 204257	24. 03	11	. 278488	21. 52	. 286814	21. 93
12	. 198778	23. 62	. 205696	23. 98	12	. 279777	21. 48	. 288128	21. 90
13	. 200192	23. 57	. 207133	23. 95	13	. 281065	21. 47	. 289441	21. 88
14	. 201604	23. 53	. 208568	23. 92	14	. 282350	21. 42	290751	21. 83
15	8. 203014	23. 50	8. 210001	23. 88	15	8. 283634	21. 40	8. 292060	21. 82
16	. 204421	23. 45	. 211431	23. 83	16	. 284916	21. 37	. 293367	21. 78
17	. 205826	23. 42	. 212859	23. 80	17	. 286196	21. 33	. 294672	21. 75
18	. 207229	23. 38	. 214285	23. 77	18	. 287473	21. 28	. 295975	21. 72
19	. 208630	23. 35	. 215708	23. 72	19	. 288749	21. 27	. 297276	21. 68
20	8. 210028	23. 30	8. 217130	23. 70	20	8. 290024	21. 25	8. 298576	21. 67
21	. 211424	23. 27	. 218549	23. 65	21	. 291296	21. 20	. 299873	21. 62
22	. 212818	23. 23	. 219966	23. 62	22	. 292566	21. 17	. 301169	21. 60
23	. 214209	23. 18	. 221380	23. 57	23	. 293835	21. 15	. 302463	21. 57
24	. 215599	23. 17	. 222793	23. 55	24	. 295101	21. 10	. 303755	21. 53
25	8. 216986	23. 12	8. 224203	23. 50	25	8. 296366	21. 08	8. 305045	21. 50
26	. 218371	23. 08	. 225611	23. 47	26	. 297629	21. 05	. 306334	21. 48
27	. 219753	23. 03	. 227017	23. 43	27	. 298890	21. 02	. 307620	21. 43
28	. 221133	23. 00	. 228421	23. 40	28	. 300149	20. 98	. 308905	21. 42
29	. 222512	22. 98	. 229822	23. 35	29	. 301406	20. 95	. 310188	21. 38
30	8. 223888	22. 93	8. 231221	23. 32	30	8. 302662	20. 93	8. 311469	21. 35
31	. 225261	22. 88	. 232619	23. 30	31	. 303916	20. 90	. 312749	21. 33
32	. 226633	22. 87	. 234014	23. 25	32	. 305167	20. 85	. 314026	21. 28
33	. 228002	22. 82	. 235407	23. 22	33	. 306418	20. 85	. 315302	21. 27
34	. 229369	22. 78	. 236797	23. 17	34	. 307666	20. 80	. 316576	21. 23
35	8. 230735	22. 77	8. 238186	23. 15	35	8. 308912	20. 77	8. 317848	21. 20
36	. 232097	22. 70	. 239572	23. 10	36	. 310157	20. 75	. 319119	21. 18
37	. 233458	22. 68	. 240957	23. 08	37	. 311400	20. 72	. 320388	21. 15
38	. 234817	22. 65	. 242339	23. 03	38	. 312641	20. 68	. 321655	21. 12
39	. 236173	22. 60	. 243719	23. 00	39	. 313880	20. 65	. 322920	21. 08
40	8. 237527	22. 57	8. 245097	22. 97	40	8. 315117	20. 62	8. 324183	21. 05
41	. 238880	22. 55	. 246473	22. 93	41	. 316353	20. 60	. 325445	21. 03
42	. 240230	22. 50	. 247847	22. 90	42	. 317587	20. 57	. 326705	21. 00
43	. 241578	22. 47	. 249219	22. 87	43	. 318819	20. 53	. 327964	20. 98
44	. 242924	22. 43	. 250589	22. 83	44	. 320049	20. 50	. 329220	20. 93
45	8. 244267	22. 38	8. 251957	22. 80	45	8. 321278	20. 48	8. 330475	20. 92
46	. 245609	22. 37	. 253322	22. 75	46	. 322505	20. 45	. 331728	20. 88
47	. 246948	22. 32	. 254686	22. 73	47	. 323730	20. 42	. 332980	20. 87
48	. 248286	22. 30	. 256047	22. 68	48	. 324953	20. 38	. 334229	20. 82
49	. 249621	22. 25	. 257407	22. 67	49	. 326175	20. 37	. 335477	20. 80
50	8. 250955	22. 23	8. 258764	22. 62	50	8. 327395	20. 33	8. 336724	20. 78
51	. 252286	22. 18	. 260120	22. 60	51	. 328613	20. 30	. 337968	20. 73
52	. 253615	22. 15	. 261473	22. 55	52	. 329829	20. 27	. 339211	20. 72
53	. 254942	22. 12	. 262825	22. 53	53	. 331044	20. 25	. 340453	20. 70
54	. 256268	22. 10	. 264174	22. 48	54	. 332257	20. 22	. 341692	20. 65
55	8. 257591	22. 05	8. 265522	22. 47	55	8. 333468	20. 18	8. 342930	20. 63
56	. 258912	22. 02	. 266867	22. 42	56	. 334678	20. 17	. 344166	20. 60
57	. 260231	21. 98	. 268211	22. 40	57	. 335886	20. 13	. 345401	20. 58
58	. 261548	21. 95	. 269552	22. 35	58	. 337092	20. 10	. 346634	20. 55
59	. 262863	21. 92	. 270892	22. 33	59	. 338296	20. 07	. 347865	20. 52
60	8. 264176	21. 88	8. 272229	22. 28	60	8. 339499	20. 05	8. 349095	20. 50

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

12°					13°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8.339499		8.349095		0	8.408748		8.420024	
		20.02		20.47			18.47		18.95
1	.340700	20.00	.350323	20.43	1	.409856	18.43	.421161	18.93
2	.341900	19.95	.351549	20.42	2	.410962	18.42	.422297	18.90
3	.343097	19.95	.352774	20.38	3	.412067	18.40	.423431	18.88
4	.344294	19.90	.353997	20.35	4	.413171	18.38	.424564	18.87
5	8.345488	19.88	8.355218	20.33	5	8.414274	18.35	8.425696	18.83
6	.346681	19.85	.356438	20.30	6	.415375	18.32	.426826	18.82
7	.347872	19.82	.357656	20.28	7	.416474	18.30	.427955	18.80
8	.349061	19.80	.358873	20.25	8	.417572	18.28	.429083	18.77
9	.350249	19.77	.360088	20.22	9	.418669	18.25	.430209	18.75
10	8.351435		8.361301		10	8.419764		8.431334	
		19.75		20.20			18.23		18.73
11	.352620	19.72	.362513	20.18	11	.420858	18.22	.432458	18.70
12	.353803	19.68	.363724	20.13	12	.421951	18.18	.433580	18.67
13	.354984	19.67	.364932	20.12	13	.423042	18.17	.434700	18.67
14	.356164	19.63	.366139	20.10	14	.424132	18.13	.435820	18.63
15	8.357342	19.60	8.367345	20.07	15	8.425220	18.12	8.436938	18.62
16	.358518	19.58	.368549	20.03	16	.426307	18.10	.438055	18.58
17	.359693	19.55	.369751	20.02	17	.427393	18.07	.439170	18.57
18	.360866	19.53	.370952	19.98	18	.428477	18.05	.440284	18.55
19	.362038	19.50	.372151	19.95	19	.429560	18.02	.441397	18.53
20	8.363208		8.373348		20	8.430641		8.442509	
		19.48		19.95			18.02		18.50
21	.364377	19.43	.374545	19.90	21	.431722	17.97	.443619	18.47
22	.365543	19.43	.375739	19.88	22	.432800	17.97	.444727	18.47
23	.366709	19.38	.376932	19.85	23	.433878	17.93	.445835	18.43
24	.367872	19.37	.378123	19.83	24	.434954	17.92	.446941	18.42
25	8.369034	19.35	8.379313	19.82	25	8.436029	17.88	8.448046	18.38
26	.370195	19.32	.380502	19.78	26	.437102	17.87	.449149	18.38
27	.371354	19.28	.381689	19.75	27	.438174	17.85	.450252	18.35
28	.372511	19.27	.382874	19.73	28	.439245	17.82	.451353	18.32
29	.373667	19.25	.384058	19.70	29	.440314	17.80	.452452	18.32
30	8.374822		8.385240		30	8.441382		8.453551	
		19.20		19.68			17.78		18.28
31	.375974	19.18	.386421	19.65	31	.442449	17.75	.454648	18.25
32	.377125	19.17	.387600	19.63	32	.443514	17.73	.455743	18.25
33	.378275	19.13	.388778	19.60	33	.444578	17.72	.456838	18.22
34	.379423	19.12	.389954	19.58	34	.445641	17.68	.457931	18.20
35	8.380570	19.08	8.391129	19.55	35	8.446702	17.68	8.459023	18.18
36	.381715	19.05	.392302	19.53	36	.447763	17.63	.460114	18.15
37	.382858	19.03	.393474	19.50	37	.448821	17.63	.461203	18.13
38	.384000	19.02	.394644	19.48	38	.449879	17.60	.462291	18.12
39	.385141	18.98	.395813	19.45	39	.450935	17.58	.463378	18.10
40	8.386280		8.396980		40	8.451990		8.464464	
		18.95		19.43			17.55		18.07
41	.387417	18.93	.398146	19.42	41	.453043	17.55	.465548	18.05
42	.388553	18.92	.399311	19.38	42	.454096	17.52	.466631	18.03
43	.389688	18.88	.400474	19.35	43	.455147	17.48	.467713	18.00
44	.390821	18.85	.401635	19.33	44	.456196	17.48	.468793	18.00
45	8.391952	18.83	8.402795	19.32	45	8.457245	17.45	8.469873	17.97
46	.393082	18.82	.403954	19.28	46	.458292	17.43	.470951	17.95
47	.394211	18.78	.405111	19.27	47	.459338	17.40	.472028	17.92
48	.395338	18.75	.406267	19.23	48	.460382	17.40	.473103	17.90
49	.396463	18.73	.407421	19.22	49	.461426	17.37	.474177	17.90
50	8.397587		8.408574		50	8.462468		8.475251	
		18.72		19.18			17.35		17.85
51	.398710	18.68	.409725	19.17	51	.463509	17.32	.476322	17.85
52	.399831	18.67	.410875	19.13	52	.464548	17.30	.477393	17.83
53	.400951	18.63	.412023	19.13	53	.465586	17.28	.478463	17.80
54	.402069	18.62	.413171	19.08	54	.466623	17.27	.479531	17.78
55	8.403186	18.58	8.414316	19.08	55	8.467659	17.23	8.480598	17.77
56	.404301	18.57	.415461	19.03	56	.468693	17.23	.481664	17.73
57	.405415	18.53	.416603	19.03	57	.469727	17.20	.482728	17.73
58	.406527	18.52	.417745	19.00	58	.470759	17.17	.483792	17.70
59	.407638	18.50	.418885	18.98	59	.471789	17.17	.484854	17.68
60	8.408748		8.420024		60	8.472819		8.485915	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

14°					15°				
M.	Vers.	D. 1″.	Exsec.	D.1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8. 472819		8. 485915		0	8. 532425		8. 547482	
1	. 473847	17. 13	. 486975	17. 67	1	. 533384	15. 98	. 548474	16. 53
2	. 474874	17. 12	. 488033	17. 63	2	. 534342	15. 97	. 549466	16. 53
3	. 475900	17. 10	. 489091	17. 63	3	. 535299	15. 95	. 550457	16. 52
4	. 476925	17. 08	. 490147	17. 60	4	. 536255	15. 93	. 551447	16. 50
5	8. 477948	17. 05	8. 491202	17. 58	5	8. 537210	15. 92	8. 552436	16. 48
6	. 478970	17. 03	. 492256	17. 57	6	. 538163	15. 88	. 553424	16. 47
7	. 479991	17. 02	. 493308	17. 53	7	. 539116	15. 88	. 554410	16. 43
8	. 481011	17. 00	. 494360	17. 53	8	. 540068	15. 87	. 555396	16. 43
9	. 482029	16. 97	. 495410	17. 50	9	. 541018	15. 83	. 556381	16. 42
		16. 95		17. 48			15. 83		16. 38
10	8. 483046		8. 496459		10	8. 541968		8. 557364	
11	. 484062	16. 93	. 497507	17. 47	11	. 542916	15. 80	. 558347	16. 38
12	. 485077	16. 92	. 498554	17. 45	12	. 543863	15. 78	. 559329	16. 37
13	. 486091	16. 90	. 499600	17. 43	13	. 544810	15. 78	. 560309	16. 33
14	. 487103	16. 87	. 500644	17. 40	14	. 545755	15. 75	. 561289	16. 33
15	8. 488115	16. 87	8. 501687	17. 38	15	8. 546699	15. 73	8. 562267	16. 30
16	. 489125	16. 83	. 502730	17. 38	16	. 547642	15. 72	. 563245	16. 30
17	. 490134	16. 82	. 503771	17. 35	17	. 548584	15. 70	. 564222	16. 28
18	. 491141	16. 78	. 504810	17. 32	18	. 549525	15. 68	. 565197	16. 25
19	. 492148	16. 78	. 505849	17. 32	19	. 550465	15. 67	. 566172	16. 25
		16. 75		17. 30			15. 65		16. 22
20	8. 493153		8. 506887		20	8. 551404		8. 567145	
21	. 494157	16. 73	. 507923	17. 27	21	. 552342	15. 63	. 568118	16. 22
22	. 495160	16. 72	. 508958	17. 25	22	. 553279	15. 62	. 569090	16. 20
23	. 496162	16. 70	. 509993	17. 25	23	. 554215	15. 60	. 570060	16. 17
24	. 497162	16. 67	. 511026	17. 22	24	. 555150	15. 58	. 571030	16. 17
25	8. 498162	16. 67	8. 512057	17. 18	25	8. 556084	15. 57	8. 571999	16. 15
26	. 499160	16. 63	. 513088	17. 18	26	. 557017	15. 55	. 572966	16. 12
27	. 500157	16. 62	. 514118	17. 17	27	. 557949	15. 53	. 573933	16. 12
28	. 501153	16. 60	. 515146	17. 13	28	. 558879	15. 50	. 574899	16. 10
29	. 502148	16. 58	. 516174	17. 13	29	. 559809	15. 50	. 575864	16. 08
		16. 57		17. 10			15. 48		16. 05
30	8. 503142		8. 517200		30	8. 560738		8. 576827	
31	. 504134	16. 53	. 518225	17. 08	31	. 561666	15. 47	. 577790	16. 05
32	. 505125	16. 52	. 519249	17. 07	32	. 562592	15. 43	. 578752	16. 03
33	. 506116	16. 52	. 520272	17. 05	33	. 563518	15. 43	. 579713	16. 02
34	. 507105	16. 48	. 521294	17. 03	34	. 564443	15. 42	. 580673	16. 00
35	8. 508092	16. 45	8. 522315	17. 02	35	. 565367	15. 40	8. 581632	15. 98
36	. 509079	16. 45	. 523334	16. 98	36	. 566289	15. 37	. 582590	15. 97
37	. 510065	16. 43	. 524353	16. 98	37	. 567211	15. 37	. 583547	15. 95
38	. 511049	16. 40	. 525370	16. 95	38	. 568132	15. 35	. 584503	15. 93
39	. 512033	16. 40	. 526387	16. 95	39	. 569052	15. 33	. 585458	15. 92
		16. 37		16. 92			15. 30		15. 90
40	8. 513015		8. 527402		40	8. 569970		8. 586412	
41	. 513996	16. 35	. 528416	16. 90	41	. 570888	15. 30	. 587365	15. 88
42	. 514976	16. 33	. 529429	16. 88	42	. 571805	15. 28	. 588318	15. 88
43	. 515955	16. 32	. 530441	16. 87	43	. 572721	15. 27	. 589269	15. 85
44	. 516932	16. 28	. 531452	16. 85	44	. 573636	15. 25	. 590219	15. 83
45	8. 517909	16. 28	8. 532462	16. 83	45	8. 574549	15. 22	8. 591169	15. 83
46	. 518884	16. 25	. 533471	16. 82	46	. 575462	15. 22	. 592117	15. 80
47	. 519859	16. 25	. 534478	16. 78	47	. 576374	15. 20	. 593065	15. 80
48	. 520832	16. 22	. 535485	16. 78	48	. 577285	15. 18	. 594012	15. 78
49	. 521804	16. 20	. 536490	16. 75	49	. 578195	15. 17	. 594957	15. 75
		16. 18		16. 75			15. 15		15. 75
50	8. 522775		8. 537495		50	8. 579104		8. 595902	
51	. 523745	16. 17	. 538498	16. 72	51	. 580012	15. 13	. 596846	15. 73
52	. 524714	16. 15	. 539501	16. 72	52	. 580919	15. 12	. 597789	15. 72
53	. 525682	16. 13	. 540502	16. 68	53	. 581825	15. 10	. 598731	15. 70
54	. 526648	16. 10	. 541502	16. 67	54	. 582730	15. 08	. 599672	15. 68
55	8. 527614	16. 10	8. 542501	16. 65	55	8. 583634	15. 07	8. 600612	15. 67
56	. 528578	16. 07	. 543499	16. 63	56	. 584537	15. 05	. 601551	15. 65
57	. 529542	16. 07	. 544497	16. 63	57	. 585440	15. 05	. 602490	15. 65
58	. 530504	16. 03	. 545493	16. 60	58	. 586341	15. 02	. 603427	15. 62
59	. 531465	16. 02	. 546488	16. 58	59	. 587241	15. 00	. 604363	15. 60
60	8. 532425	16. 00	8. 547482	16. 57	60	8. 588141	15. 00	8. 605299	15. 60

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

16°					17°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8.588141		8.605299		0	8.640434		8.659838	
		14.97		15.58			14.08		14.72
1	.589039	14.95	.606234	15.55	1	.641279	14.07	.660721	14.72
2	.589936	14.95	.607167	15.55	2	.642123	14.05	.661604	14.70
3	.590833	14.93	.608100	15.53	3	.642966	14.05	.662486	14.68
4	.591729	14.90	.609032	15.52	4	.643809	14.02	.663367	14.68
5	8.592623	14.90	8.609963	15.50	5	8.644650	14.02	8.664248	14.65
6	.593517	14.88	.610893	15.50	6	.645491	14.00	.665127	14.65
7	.594410	14.87	.611823	15.47	7	.646331	13.98	.666006	14.63
8	.595302	14.83	.612751	15.45	8	.647170	13.97	.666884	14.62
9	.596192	14.83	.613678	15.45	9	.648008	13.95	.667761	14.60
10	8.597082		8.614605		10	8.648845		8.668637	
		14.82		15.43			13.95		14.60
11	.597971	14.82	.615531	15.42	11	.649682	13.93	.669513	14.58
12	.598860	14.78	.616456	15.38	12	.650518	13.92	.670388	14.57
13	.599747	14.77	.617379	15.38	13	.651353	13.90	.671262	14.55
14	.600633	14.75	.618302	15.38	14	.652187	13.88	.672135	14.55
15	8.601518	14.75	8.619225	15.35	15	8.653020	13.87	8.673008	14.52
16	.602403	14.72	.620146	15.33	16	.653852	13.87	.673879	14.52
17	.603286	14.72	.621066	15.33	17	.654684	13.85	.674750	14.50
18	.604169	14.70	.621986	15.30	18	.655515	13.83	.675620	14.50
19	.605051	14.67	.622904	15.30	19	.656345	13.82	.676490	14.47
20	8.605931		8.623822		20	8.657174		8.677358	
		14.67		15.28			13.82		14.47
21	.606811	14.65	.624739	15.27	21	.658003	13.78	.678226	14.45
22	.607690	14.63	.625655	15.25	22	.658830	13.78	.679093	14.45
23	.608568	14.62	.626570	15.23	23	.659657	13.77	.679960	14.42
24	.609445	14.60	.627484	15.23	24	.660483	13.75	.680825	14.42
25	8.610321	14.60	8.628398	15.20	25	8.661308	13.73	8.681690	14.40
26	.611197	14.57	.629310	15.20	26	.662132	13.73	.682554	14.38
27	.612071	14.57	.630222	15.18	27	.662956	13.72	.683417	14.38
28	.612945	14.53	.631133	15.17	28	.663779	13.70	.684280	14.35
29	.613817	14.53	.632043	15.15	29	.664601	13.68	.685141	14.35
30	8.614689		8.632952		30	8.665422		8.686002	
		14.52		15.13			13.67		14.35
31	.615560	14.50	.633860	15.13	31	.666242	13.67	.686863	14.32
32	.616430	14.48	.634768	15.10	32	.667062	13.65	.687722	14.32
33	.617299	14.47	.635674	15.10	33	.667881	13.63	.688581	14.30
34	.618167	14.45	.636580	15.08	34	.668699	13.62	.689439	14.28
35	8.619034	14.45	8.637485	15.07	35	8.669516	13.60	8.690296	14.28
36	.619901	14.42	.638389	15.05	36	.670332	13.60	.691153	14.25
37	.620766	14.42	.639292	15.05	37	.671148	13.58	.692008	14.25
38	.621631	14.40	.640195	15.02	38	.671963	13.57	.692863	14.25
39	.622495	14.38	.641096	15.02	39	.672777	13.55	.693718	14.22
40	8.623358		8.641997		40	8.673590		8.694571	
		14.37		15.00			13.55		14.22
41	.624220	14.35	.642897	14.98	41	.674403	13.53	.695424	14.20
42	.625081	14.33	.643796	14.97	42	.675215	13.52	.696276	14.18
43	.625941	14.33	.644694	14.95	43	.676026	13.50	.697127	14.18
44	.626801	14.30	.645591	14.95	44	.676836	13.48	.697978	14.17
45	8.627659	14.30	8.646488	14.93	45	8.677645	13.48	8.698828	14.15
46	.628517	14.28	.647384	14.92	46	.678454	13.47	.699677	14.13
47	.629374	14.27	.648279	14.90	47	.679262	13.45	.700525	14.13
48	.630230	14.25	.649173	14.88	48	.680069	13.43	.701373	14.12
49	.631085	14.23	.650066	14.87	49	.680875	13.43	.702220	14.10
50	8.631939		8.650958		50	8.681681		8.703066	
		14.22		14.87			13.42		14.10
51	.632792	14.22	.651850	14.85	51	.682486	13.40	.703912	14.07
52	.633645	14.18	.652741	14.83	52	.683290	13.38	.704756	14.07
53	.634496	14.18	.653631	14.82	53	.684093	13.38	.705600	14.07
54	.635347	14.17	.654520	14.80	54	.684896	13.35	.706444	14.03
55	8.636197	14.15	8.655408	14.80	55	8.685697	13.35	8.707286	14.03
56	.637046	14.13	.656296	14.77	56	.686498	13.35	.708128	14.02
57	.637894	14.13	.657182	14.77	57	.687299	13.32	.708969	14.02
58	.638742	14.10	.658068	14.77	58	.688098	13.32	.709810	14.00
59	.639588	14.10	.658954	14.73	59	.688897	13.30	.710650	13.98
60	8.640434		8.659838		60	8.689695		8.711489	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

18°					19°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8. 689695		8. 711489		0	8. 736248		8. 760578	
		13. 28		13. 97			12. 58		13. 30
1	. 690492	13. 28	. 712327	13. 95	1	. 737003	12. 57	. 761376	13. 30
2	. 691289	13. 25	. 713164	13. 95	2	. 737757	12. 55	. 762174	13. 28
3	. 692084	13. 25	. 714001	13. 95	3	. 738510	12. 55	. 762971	13. 27
4	. 692879	13. 25	. 714838	13. 92	4	. 739263	12. 53	. 763767	13. 27
5	8. 693674	13. 22	8. 715673	13. 92	5	8. 740015	12. 52	8. 764563	13. 25
6	. 694467	13. 22	. 716508	13. 90	6	. 740766	12. 50	. 765358	13. 23
7	. 695260	13. 20	. 717342	13. 88	7	. 741516	12. 50	. 766152	13. 23
8	. 696052	13. 18	. 718175	13. 88	8	. 742266	12. 50	. 766946	13. 22
9	. 696843	13. 18	. 719008	13. 87	9	. 743016	12. 47	. 767739	13. 20
10	8. 697634		8. 719840		10	8. 743764		8. 768531	
		13. 17		13. 85			12. 47		13. 20
11	. 698424	13. 15	. 720671	13. 85	11	. 744512	12. 45	. 769323	13. 18
12	. 699213	13. 13	. 721502	13. 83	12	. 745259	12. 45	. 770114	13. 18
13	. 700001	13. 13	. 722332	13. 82	13	. 746006	12. 43	. 700905	13. 17
14	. 700789	13. 12	. 723161	13. 80	14	. 746752	12. 42	. 771695	13. 15
15	8. 701576	13. 10	8. 723989	13. 80	15	8. 747497	12. 42	8. 772484	13. 15
16	. 702362	13. 08	. 724817	13. 78	16	. 748242	12. 40	. 773273	13. 13
17	. 703147	13. 08	. 725644	13. 78	17	. 748986	12. 38	. 774061	13. 13
18	. 703932	13. 07	. 726471	13. 77	18	. 749729	12. 38	. 774849	13. 10
19	. 704716	13. 05	. 727297	13. 75	19	. 750472	12. 37	. 775635	13. 12
20	8. 705499		8. 728122		20	8. 751214		8. 776422	
		13. 05		13. 73			12. 35		13. 08
21	. 706282	13. 02	. 728946	13. 73	21	. 751955	12. 35	. 777207	13. 10
22	. 707063	13. 02	. 729770	13. 72	22	. 752696	12. 33	. 777993	13. 07
23	. 707844	13. 02	. 730593	13. 70	23	. 753436	12. 32	. 778777	13. 07
24	. 708625	12. 98	. 731415	13. 70	24	. 754175	12. 32	. 779561	13. 05
25	8. 709404	12. 98	8. 732237	13. 68	25	8. 754914	12. 30	8. 780344	13. 05
26	. 710183	12. 97	. 733058	13. 67	26	. 755652	12. 28	. 781127	13. 03
27	. 710961	12. 97	. 733878	13. 67	27	. 756389	12. 28	. 781909	13. 02
28	. 711739	12. 95	. 734698	13. 65	28	. 757126	12. 27	. 782690	13. 02
29	. 712516	12. 93	. 735517	13. 63	29	. 757862	12. 27	. 783471	13. 00
30	8. 713292		8. 736335		30	8. 758598		8. 784251	
		12. 92		13. 63			12. 25		13. 00
31	. 714067	12. 92	. 737153	13. 62	31	. 759333	12. 23	. 785031	12. 98
32	. 714842	12. 90	. 737970	13. 60	32	. 760067	12. 23	. 785810	12. 97
33	. 715616	12. 88	. 738786	13. 60	33	. 760801	12. 22	. 786588	12. 97
34	. 716389	12. 87	. 739602	13. 58	34	. 761534	12. 20	. 787366	12. 97
35	8. 717161	12. 87	8. 740417	13. 57	35	8. 762266	12. 20	8. 788144	12. 93
36	. 717933	12. 85	. 741231	13. 57	36	. 762998	12. 18	. 788920	12. 93
37	. 718704	12. 85	. 742045	13. 55	37	. 763729	12. 17	. 789696	12. 93
38	. 719475	12. 82	. 742858	13. 53	38	. 764459	12. 17	. 790472	12. 92
39	. 720244	12. 82	. 743670	13. 53	39	. 765189	12. 15	. 791247	12. 90
40	8. 721013		8. 744482		40	8. 765918		8. 792021	
		12. 82		13. 52			12. 15		12. 90
41	. 721782	12. 78	. 745293	13. 50	41	. 766647	12. 12	. 792795	12. 88
42	. 722549	12. 78	. 746103	13. 50	42	. 767374	12. 13	. 793568	12. 87
43	. 723316	12. 78	. 746913	13. 48	43	. 768102	12. 10	. 794340	12. 87
44	. 724083	12. 75	. 747722	13. 47	44	. 768828	12. 10	. 795112	12. 87
45	8. 724848	12. 75	8. 748530	13. 47	45	8. 769554	12. 10	8. 795884	12. 83
46	. 725613	12. 73	. 749338	13. 45	46	. 770280	12. 08	. 796654	12. 85
47	. 726377	12. 72	. 750145	13. 43	47	. 771005	12. 07	. 797425	12. 82
48	. 727140	12. 72	. 750951	13. 43	48	. 771729	12. 05	. 798194	12. 82
49	. 727903	12. 70	. 751757	13. 42	49	. 772452	12. 05	. 798963	12. 82
50	8. 728665		8. 752562		50	8. 773175		8. 799732	
		12. 70		13. 42			12. 05		12. 80
51	. 729427	12. 67	. 753367	13. 40	51	. 773898	12. 02	. 800500	12. 78
52	. 730187	12. 67	. 754171	13. 38	52	. 774619	12. 02	. 801267	12. 78
53	. 730947	12. 67	. 754974	13. 37	53	. 775340	12. 02	. 802034	12. 77
54	. 731707	12. 63	. 755776	13. 37	54	. 776061	12. 00	. 802800	12. 75
55	8. 732465	12. 63	8. 756578	13. 37	55	8. 776781	11. 98	8. 803565	12. 75
56	. 733223	12. 63	. 757380	13. 33	56	. 777500	11. 97	. 804330	12. 75
57	. 733981	12. 60	. 758180	13. 33	57	. 778218	11. 97	. 805095	12. 73
58	. 734737	12. 60	. 758980	13. 33	58	. 778936	11. 97	. 805859	12. 72
59	. 735493	12. 58	. 759780	13. 30	59	. 779654	11. 93	. 806622	12. 72
60	8. 736248		8. 760578		60	8. 780370		8. 807385	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

20°					21°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8.780370		8.807385		0	8.822296		8.852144	
		11.95		12.70			11.35		12.17
1	.781087	11.92	.808147	12.68	1	.822977	11.35	.852874	12.17
2	.781802	11.92	.808908	12.68	2	.823658	11.33	.853604	12.13
3	.782517	11.90	.809669	12.68	3	.824338	11.33	.854332	12.15
4	.783231	11.90	.810430	12.67	4	.825018	11.32	.855061	12.13
5	8.783945	11.88	8.811190	12.65	5	8.825697	11.32	8.855789	12.12
6	.784658	11.88	.811949	12.65	6	.826376	11.30	.856516	12.12
7	.785371	11.87	.812708	12.63	7	.827054	11.28	.857243	12.10
8	.786083	11.85	.813466	12.63	8	.827731	11.28	.857969	12.10
9	.786794	11.85	.814224	12.62	9	.828408	11.28	.858695	12.08
10	8.787505		8.814981		10	8.829085		8.859420	
11	.788215	11.83	.815737	12.60	11	.829761	11.27	.860145	12.08
12	.788924	11.82	.816493	12.60	12	.830436	11.25	.860869	12.07
13	.789633	11.82	.817249	12.60	13	.831111	11.25	.861593	12.07
14	.790342	11.82	.818004	12.58	14	.831785	11.23	.862316	12.05
15	8.791049	11.78	8.818758	12.57	15	8.832459	11.23	8.863039	12.05
16	.791756	11.78	.819512	12.57	16	.833132	11.22	.863761	12.03
17	.792463	11.78	.820265	12.55	17	.833804	11.20	.864483	12.03
18	.793169	11.77	.821018	12.55	18	.834476	11.20	865204	12.02
19	.793874	11.75	.821770	12.53	19	.835148	11.20	.865925	12.02
20	8.794579	11.75	8.822521	12.52	20	8.835819	11.18	8.866646	12.02
21	.795283	11.73	.823272	12.52	21	.836489	11.17	.867365	11.98
22	.795987	11.73	.824023	12.50	22	.837159	11.17	.868085	12.00
23	.796690	11.72	.824773	12.48	23	.837829	11.17	.868804	11.98
24	.797392	11.70	.825522	12.48	24	.838498	11.15	.869522	11.97
25	8.798094	11.70	8.826271	12.47	25	8.839166	11.13	8.870240	11.97
26	.798795	11.68	.827019	12.47	26	.839834	11.13	.870957	11.95
27	.799496	11.68	.827767	12.45	27	.840501	11.12	.871674	11.95
28	.800196	11.67	.828514	12.45	28	.841168	11.12	.872390	11.93
29	.800896	11.67	.829261	12.43	29	.841834	11.10	.873106	11.93
30	8.801594	11.63	8.830007	12.42	30	8.842500	11.10	8.873822	11.93
31	.802293	11.65	.830752	12.42	31	.843165	11.08	.874537	11.92
32	.802991	11.63	.831497	12.42	32	.843829	11.07	.875251	11.90
33	.803688	11.62	.832242	12.40	33	.844493	11.07	.875965	11.90
34	.804384	11.60	.832986	12.38	34	.845157	11.07	.876678	11.88
35	8.805080	11.60	8.833729	12.38	35	8.845820	11.05	8.877391	11.88
36	.805776	11.58	.834472	12.38	36	.846483	11.05	.878104	11.88
37	.806471	11.57	.835215	12.37	37	.847145	11.03	.878816	11.87
38	.807165	11.57	.835957	12.35	38	.847806	11.02	.879528	11.87
39	.807859	11.55	.836698	12.35	39	.848467	11.02	.880239	11.85
40	8.808552	11.53	8.837439	12.33	40	8.849127	11.00	8.880949	11.83
41	.809244	11.53	.838179	12.33	41	.849787	11.00	.881659	11.83
42	.809936	11.53	.838919	12.32	42	.850447	10.98	.882369	11.82
43	.810628	11.52	.839658	12.30	43	.851106	10.97	.883078	11.82
44	.811319	11.50	.840396	12.32	44	.851764	10.97	.883787	11.80
45	8.812009	11.50	8.841135	12.28	45	8.852422	10.95	8.884495	11.80
46	.812699	11.48	.841872	12.28	46	.853079	10.95	.885203	11.78
47	.813388	11.48	.842609	12.28	47	.853736	10.93	.885910	11.78
48	.814077	11.47	.843346	12.27	48	.854392	10.93	.886617	11.77
49	.814765	11.45	.844082	12.25	49	.855048	10.92	.887323	11.77
50	8.815452	11.45	8.844817	12.25	50	8.855703	10.92	8.888029	11.75
51	.816139	11.43	.845552	12.25	51	.856358	10.90	.888734	11.75
52	.816825	11.43	.846287	12.23	52	.857012	10.90	.889439	11.75
53	.817511	11.42	.847021	12.22	53	.857666	10.88	.890144	11.73
54	.818196	11.42	.847754	12.22	54	.858319	10.88	.890848	11.72
55	8.818881	11.40	8.848487	12.22	55	8.858972	10.87	8.891551	11.72
56	.819565	11.40	.849220	12.20	56	.859624	10.87	.892254	11.72
57	.820249	11.38	.849952	12.18	57	.860276	10.85	.892957	11.70
58	.820932	11.37	.850683	12.18	58	.860927	10.85	.893659	11.70
59	.821614	11.37	.851414	12.17	59	.861578	10.83	.894361	11.68
60	8.822296		8.852144		60	8.862228		8.895062	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

22°					23°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8. 862228	10. 82	8. 895062	11. 68	0	8. 900341	10. 33	8. 936315	11. 23
1	. 862877	10. 83	. 895763	11. 67	1	. 900961	10. 35	. 936989	11. 23
2	. 863527	10. 80	. 896463	11. 67	2	. 901582	10. 32	. 937663	11. 22
3	. 864175	10. 80	. 897163	11. 65	3	. 902201	10. 33	. 938336	11. 22
4	. 864823	10. 80	897862	11. 65	4	. 902821	10. 32	. 939009	11. 22
5	8. 865471	10. 78	8. 898561	11. 63	5	8. 903440	10. 30	8. 939682	11. 20
6	. 866118	10. 78	. 899259	11. 63	6	. 904058	10. 30	. 940354	11. 20
7	. 866765	10. 77	. 899957	11. 63	7	. 904676	10. 28	. 941026	11. 20
8	. 867411	10. 77	. 900655	11. 62	8	. 905293	10. 28	. 941698	11. 18
9	. 868057	10. 75	. 901352	11. 60	9	. 905910	10. 28	. 942369	11. 17
10	8. 868702	10. 73	8. 902048	11. 62	10	8. 906527	10. 27	8. 943039	11. 18
11	. 869346	10. 75	. 902745	11. 58	11	. 907143	10. 27	. 943710	11. 15
12	. 869991	10. 72	. 903440	11. 60	12	. 907759	10. 25	. 944379	11. 17
13	. 870634	10. 72	. 904136	11. 57	13	. 908374	10. 25	. 945049	11. 15
14	. 871277	10. 72	. 904830	11. 58	14	. 908989	10. 23	. 945718	11. 13
15	8. 871920	10. 70	8. 905525	11. 57	15	8. 909603	10. 23	8. 946386	11. 13
16	. 872562	10. 70	. 906219	11. 55	16	. 910217	10. 22	. 947054	11. 13
17	. 873204	10. 68	. 906912	11. 55	17	. 910830	10. 22	. 947722	11. 12
18	. 873845	10. 68	. 907605	11. 55	18	. 911443	10. 22	. 948389	11. 12
19	. 874486	10. 67	. 908298	11. 53	19	. 912056	10. 20	. 949056	11. 12
20	8. 875126	10. 67	8. 908990	11. 52	20	8. 912668	10. 18	8. 949723	11. 10
21	. 875766	10. 65	. 909681	11. 52	21	. 913279	10. 20	. 950389	11. 10
22	. 876405	10. 65	. 910372	11. 52	22	. 913891	10. 17	. 951055	11. 08
23	. 877044	10. 63	. 911063	11. 52	23	. 914501	10. 17	. 951720	11. 08
24	. 877682	10. 63	. 911754	11. 48	24	. 915111	10. 17	. 952385	11. 07
25	8. 878320	10. 62	8. 912443	11. 50	25	8. 915721	10. 17	8. 953049	11. 07
26	. 878957	10. 62	. 913133	11. 48	26	. 916331	10. 15	. 953713	11. 07
27	. 879594	10. 60	. 913822	11. 47	27	. 916940	10. 13	. 954377	11. 05
28	. 880230	10. 60	. 914510	11. 47	28	. 917548	10. 13	. 955040	11. 05
29	. 880866	10. 58	. 915198	11. 47	29	. 918156	10. 13	. 955703	11. 05
30	8. 881501	10. 58	8. 915886	11. 45	30	8. 918764	10. 12	8. 956366	11. 03
31	. 882136	10. 58	. 916573	11. 45	31	. 919371	10. 10	. 957028	11. 03
32	. 882771	10. 57	. 917260	11. 43	32	. 919977	10. 12	. 957690	11. 02
33	. 883405	10. 55	. 917946	11. 43	33	. 920584	10. 10	. 958351	11. 02
34	. 884038	10. 55	. 918632	11. 43	34	. 921190	10. 08	. 959012	11. 00
35	8. 884671	10. 53	8. 919318	11. 42	35	8. 921795	10. 08	8. 959672	11. 00
36	. 885303	10. 53	. 920003	11. 40	36	. 922400	10. 07	. 960332	11. 00
37	. 885935	10. 53	. 920687	11. 42	37	. 923004	10. 07	. 960992	10. 98
38	. 886567	10. 52	. 921372	11. 38	38	. 923608	10. 07	. 961651	10. 98
39	. 887198	10. 52	. 922055	11. 40	39	. 924212	10. 05	. 962310	10. 98
40	8. 887829	10. 50	8. 922739	11. 37	40	8. 924815	10. 05	8. 962969	10. 97
41	. 888459	10. 48	. 923421	11. 38	41	. 925418	10. 03	. 963627	10. 97
42	. 889088	10. 48	. 924104	11. 37	42	. 926020	10. 03	. 964285	10. 95
43	. 889717	10. 48	. 924786	11. 35	43	. 926622	10. 03	. 964942	10. 95
44	. 890346	10. 47	. 925467	11. 37	44	. 927224	10. 02	. 965599	10. 95
45	8. 890974	10. 47	8. 926149	11. 33	45	8. 927825	10. 00	8. 966256	10. 93
46	. 891602	10. 45	. 926829	11. 35	46	. 928425	10. 00	. 966912	10. 93
47	. 892229	10. 45	. 927510	11. 32	47	. 929025	10. 00	. 967568	10. 92
48	. 892856	10. 43	. 928189	11. 33	48	. 929626	9. 98	. 968223	10. 92
49	. 893482	10. 43	928869	11. 32	49	. 930224	9. 98	. 968878	10. 92
50	8. 894108	10. 42	8. 929548	11. 30	50	8. 930823	9. 97	8. 969533	10. 90
51	. 894733	10. 42	. 930226	11. 32	51	. 931421	9. 97	. 970187	10. 90
52	. 895358	10. 42	. 930905	11. 28	52	. 932019	9. 97	. 970841	10. 88
53	. 895983	10. 40	. 931582	11. 30	53	. 932617	9. 95	. 971494	10. 88
54	. 896607	10. 38	. 932260	11. 27	54	. 933214	9. 95	. 972147	10. 88
55	8. 897230	10. 38	8. 932936	11. 28	55	8. 933811	9. 93	8. 972800	10. 87
56	. 897853	10. 38	. 933613	11. 27	56	. 934407	9. 93	. 973452	10. 87
57	. 898476	10. 37	. 934289	11. 27	57	. 935003	9. 92	. 974104	10. 87
58	. 899098	10. 35	. 934965	11. 25	58	. 935598	9. 92	. 974756	10. 85
59	. 899719	10. 37	. 935640	11. 25	59	. 936193	9. 92	. 975407	10. 85
60	8. 900341		8. 936315		60	8. 936788		8. 976058	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

24°					25°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	8.936788		8.976058		0	8.971703		9.014428	
1	.937382	9.90	.976708	10.83	1	.972273	9.50	.015056	10.47
2	.937976	9.90	.977358	10.83	2	.972842	9.48	.015685	10.48
3	.938569	9.88	.978008	10.83	3	.973411	9.48	.016312	10.45
4	.939162	9.88	.978657	10.82	4	.973980	9.48	.016940	10.47
5	8.939754	9.87	8.979306	10.82	5	8.974548	9.47	9.017567	10.45
6	.940346	9.87	.979954	10.80	6	.975116	9.47	.018194	10.45
7	.940938	9.87	.980602	10.80	7	.975683	9.45	.018821	10.45
8	.941529	9.85	.981250	10.80	8	.976250	9.45	.019447	10.43
9	.942120	9.85	.981898	10.80	9	.976816	9.43	.020073	10.43
10	8.942710	9.83	8.982545	10.78	10	8.977382	9.43	9.020698	10.42
11	.943300	9.82	.983191	10.77	11	.977948	9.43	.021323	10.42
12	.943889	9.83	.983837	10.77	12	.978514	9.40	.021948	10.40
13	.944479	9.80	.984483	10.77	13	.979078	9.42	.022572	10.42
14	.945067	9.80	.985129	10.75	14	.979643	9.40	.023197	10.38
15	8.945655	9.80	8.985774	10.75	15	8.980207	9.40	9.023820	10.40
16	.946243	9.80	.986419	10.73	16	.980771	9.40	.024444	10.38
17	.946831	9.78	.987063	10.73	17	.981335	9.38	.025067	10.38
18	.947418	9.77	.987707	10.73	18	.981898	9.37	.025690	10.37
19	.948004	9.77	.988351	10.72	19	.982460	9.38	.026312	10.37
20	8.948590	9.77	8.988994	10.72	20	8.983023	9.37	9.026934	10.37
21	.949176	9.75	.989637	10.70	21	.983585	9.35	.027556	10.35
22	.949761	9.75	.990279	10.72	22	.984146	9.35	.028177	10.35
23	.950346	9.75	.990922	10.68	23	.984707	9.35	.028798	10.35
24	.950931	9.73	.991563	10.70	24	.985268	9.33	.029419	10.33
25	8.951515	9.73	8.992205	10.68	25	8.985828	9.33	9.030039	10.33
26	.952099	9.72	.992846	10.68	26	.986388	9.33	.030659	10.33
27	.952682	9.72	.993487	10.67	27	.986948	9.32	.031279	10.33
28	.953265	9.70	.994127	10.67	28	.987507	9.32	.031899	10.32
29	.953847	9.70	.994767	10.65	29	.988066	9.32	.032518	10.30
30	8.954429	9.70	8.995406	10.67	30	8.988625	9.30	9.033136	10.32
31	.955011	9.68	.996046	10.65	31	.989183	9.28	.033755	10.30
32	.955592	9.68	.996685	10.63	32	.989740	9.30	.034373	10.30
33	.956173	9.67	.997323	10.63	33	.990298	9.28	.034991	10.28
34	.956753	9.68	.997961	10.63	34	.990855	9.27	.035608	10.28
35	8.957334	9.65	8.998599	10.62	35	8.991411	9.28	9.036225	10.28
36	.957913	9.65	.999236	10.62	36	.991968	9.25	.036842	10.27
37	.958492	9.65	.999873	10.62	37	.992523	9.27	.037458	10.27
38	.959071	9.65	9.000510	10.62	38	.993079	9.25	.038074	10.27
39	.959650	9.62	.001147	10.60	39	.993634	9.25	.038690	10.25
40	8.960227	9.63	9.001783	10.58	40	8.994189	9.23	9.039305	10.25
41	.960805	9.62	.002418	10.58	41	.994743	9.23	.039920	10.25
42	.961382	9.62	.003053	10.58	42	.995297	9.23	.040535	10.25
43	.961959	9.60	.003688	10.58	43	.995851	9.22	.041150	10.23
44	.962535	9.60	.004323	10.57	44	.996404	9.22	.041764	10.23
45	8.963111	9.60	9.004957	10.57	45	8.996957	9.20	9.042378	10.22
46	.963687	9.58	.005591	10.55	46	.997509	9.22	.042991	10.22
47	.964262	9.58	.006224	10.57	47	.998062	9.18	.043604	10.22
48	.964837	9.57	.006858	10.53	48	.998613	9.20	.044217	10.22
49	.965411	9.57	.007490	10.55	49	.999165	9.18	.044830	10.20
50	8.965985	9.57	9.008123	10.53	50	8.999716	9.17	9.045442	10.20
51	.966559	9.55	.008755	10.53	51	9.000266	9.18	.046054	10.18
52	.967132	9.55	.009387	10.52	52	.000817	9.17	.046665	10.18
53	.967705	9.53	.010018	10.52	53	.001367	9.15	.047276	10.18
54	.968277	9.53	.010649	10.52	54	.001916	9.17	.047887	10.18
55	8.968849	9.53	9.011280	10.50	55	9.002466	9.13	9.048498	10.17
56	.969421	9.52	.011910	10.50	56	.003014	9.15	.049108	10.17
57	.969992	9.52	.012540	10.50	57	.003563	9.13	.049718	10.17
58	.970563	9.50	.013170	10.48	58	.004111	9.13	.050328	10.15
59	.971133	9.50	.013799	10.48	59	.004659	9.12	.050937	10.15
60	8.971703		9.014428		60	9.005206		9.051546	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

26°					27°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.005206	9.12	9.051546	10.15	0	9.037401	8.77	9.087520	9.83
1	.005753	9.12	.052155	10.13	1	.037927	8.75	.088110	9.83
2	.006300	9.10	.052763	10.13	2	.038452	8.77	.088700	9.83
3	.006846	9.10	.053371	10.13	3	.038978	8.75	.089290	9.83
4	.007392	9.10	.053979	10.12	4	.039503	8.73	.089880	9.82
5	9.007938	9.08	9.054586	10.12	5	9.040027	8.75	9.090469	9.82
6	.008483	9.08	.055193	10.12	6	.040552	8.73	.091058	9.82
7	.009028	9.07	.055800	10.10	7	.041076	8.72	.091647	9.80
8	.009572	9.07	.056406	10.10	8	.041599	8.73	.092235	9.80
9	.010116	9.07	.057012	10.10	9	.042123	8.72	.092823	9.80
10	9.010660	9.05	9.057618	10.10	10	9.042646	8.70	9.093411	9.78
11	.011203	9.05	.058224	10.08	11	.043168	8.72	.093998	9.80
12	.011746	9.05	.058829	10.08	12	.043691	8.70	.094586	9.78
13	.012289	9.03	.059434	10.07	13	.044213	8.70	.095173	9.77
14	.012831	9.03	.060038	10.08	14	.044735	8.68	.095759	9.78
15	9.013373	9.03	9.060643	10.07	15	9.045256	8.68	9.096346	9.77
16	.013915	9.02	.061247	10.05	16	.045777	8.68	.096932	9.77
17	.014456	9.02	.061850	10.07	17	.046298	8.67	.097518	9.75
18	.014997	9.02	.062454	10.05	18	.046818	8.67	.098103	9.77
19	.015538	9.00	.063057	10.03	19	.047338	8.67	.098689	9.75
20	9.016078	9.00	9.063659	10.05	20	9.047858	8.65	9.099274	9.73
21	.016618	8.98	.064262	10.03	21	.048377	8.65	.099858	9.75
22	.017157	9.00	.064864	10.03	22	.048896	8.65	.100443	9.73
23	.017697	8.97	.065466	10.02	23	.049415	8.63	.101027	9.73
24	.018235	8.98	.066067	10.02	24	.049933	8.63	.101611	9.72
25	9.018774	8.97	9.066668	10.02	25	9.050451	8.63	9.102194	9.73
26	.019312	8.97	.067269	10.02	26	.050969	8.63	.102778	9.72
27	.019850	8.95	.067870	10.00	27	.051487	8.62	.103361	9.70
28	.020387	8.95	.068470	10.00	28	.052004	8.60	.103943	9.72
29	.020924	8.95	.069070	10.00	29	.052520	8.62	.104526	9.70
30	9.021461	8.93	9.069670	9.98	30	9.053037	8.60	9.105108	9.70
31	.021997	8.93	.070269	9.98	31	.053553	8.60	.105690	9.68
32	.022533	8.93	.070868	9.98	32	.054069	8.58	.106271	9.70
33	.023069	8.92	.071467	9.97	33	.054584	8.58	.106853	9.68
34	.023604	8.92	.072065	9.97	34	.055099	8.58	.107434	9.68
35	9.024139	8.90	9.072663	9.97	35	9.055614	8.58	9.108015	9.67
36	.024673	8.92	.073261	9.97	36	.056129	8.57	.108595	9.67
37	.025208	8.90	.073859	9.95	37	.056643	8.57	.109175	9.67
38	.025742	8.88	.074456	9.95	38	.057157	8.55	.109755	9.67
39	.026275	8.88	.075053	9.93	39	.057670	8.55	.110335	9.65
40	9.026808	8.88	9.075649	9.95	40	9.058183	8.55	9.110914	9.67
41	.027341	8.88	.076246	9.93	41	.058696	8.55	.111494	9.63
42	.027874	8.87	.076842	9.92	42	.059209	8.53	.112072	9.65
43	.028406	8.87	.077437	9.93	43	.059721	8.53	.112651	9.63
44	.028938	8.85	.078033	9.92	44	.060233	8.53	.113229	9.63
45	9.029469	8.85	9.078628	9.92	45	9.060745	8.52	9.113807	9.63
46	.030000	8.85	.079223	9.90	46	.061256	8.52	.114385	9.63
47	.030531	8.85	.079817	9.92	47	.061767	8.50	.114963	9.62
48	.031062	8.83	.080412	9.90	48	.062277	8.52	.115540	9.62
49	.031592	8.83	.081006	9.88	49	.062788	8.50	.116117	9.60
50	9.032122	8.82	9.081599	9.90	50	9.063298	8.48	9.116693	9.62
51	.032651	8.82	.082193	9.88	51	.063807	8.50	.117270	9.60
52	.033180	8.82	.082786	9.87	52	.064317	8.48	.117846	9.60
53	.033709	8.80	.083378	9.88	53	.064826	8.48	.118422	9.58
54	.034237	8.80	.083971	9.87	54	.065335	8.47	.118997	9.60
55	9.034765	8.80	9.084563	9.87	55	9.065843	8.47	9.119573	9.58
56	.035293	8.78	.085155	9.87	56	.066351	8.47	.120148	9.58
57	.035820	8.78	.085747	9.85	57	.066859	8.45	.120723	9.57
58	.036347	8.78	.086338	9.85	58	.067366	8.47	.121297	9.57
59	.036874	8.78	.086929	9.85	59	.067874	8.43	.121871	9.57
60	9.037401		9.087520		60	9.068380		9.122445	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

28°					29°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.068380	8.45	9.122445	9.57	0	9.098229	8.15	9.156410	9.30
1	.068887	8.43	.123019	9.57	1	.098718	8.13	.156968	9.32
2	.069393	8.43	.123593	9.55	2	.099206	8.12	.157527	9.28
3	.069899	8.43	.124166	9.55	3	.099693	8.13	.158084	9.30
4	.070405	8.42	.124739	9.53	4	.100181	8.12	.158642	9.30
5	9.070910	8.42	9.125311	9.55	5	9.100668	8.12	9.159200	9.28
6	.071415	8.40	.125884	9.53	6	.101155	8.12	.159757	9.28
7	.071919	8.42	.126456	9.53	7	.101642	8.10	.160314	9.27
8	.072424	8.40	.127028	9.52	8	.102128	8.10	.160870	9.28
9	.072928	8.40	.127599	9.53	9	.102614	8.10	.161427	9.27
10	9.073432	8.38	9.128171	9.52	10	9.103100	8.08	9.161983	9.27
11	.073935	8.38	.128742	9.52	11	.103585	8.08	.162539	9.27
12	.074438	8.38	.129313	9.50	12	.104070	8.08	.163995	9.25
13	.074941	8.37	.129883	9.50	13	.104555	8.08	.163650	9.25
14	.075443	8.38	.130453	9.50	14	.105040	8.07	.164205	9.25
15	9.075946	8.35	9.131023	9.50	15	9.105524	8.07	9.164760	9.25
16	.076447	8.37	.131593	9.50	16	.106008	8.05	.165315	9.25
17	.076949	8.35	.132163	9.48	17	.106491	8.07	.165870	9.23
18	.077450	8.35	.132732	9.48	18	.106975	8.05	.166424	9.23
19	.077951	8.35	.133301	9.48	19	.107458	8.05	.166978	9.23
20	9.078452	8.33	9.133870	9.47	20	9.107941	8.03	9.167532	9.22
21	.078952	8.33	.134438	9.47	21	.108423	8.05	.168085	9.23
22	.079452	8.33	.135006	9.47	22	.108906	8.03	.168639	9.22
23	.079952	8.32	.135574	9.47	23	.109388	8.02	.169192	9.22
24	.080451	8.32	.136142	9.45	24	.109869	8.03	.169745	9.20
25	9.080950	8.32	9.136709	9.47	25	9.110351	8.02	9.170297	9.22
26	.081449	8.32	.137277	9.45	26	.110832	8.02	.170850	9.20
27	.081948	8.30	.137844	9.43	27	.111313	8.00	.171402	9.20
28	.082446	8.30	.138410	9.45	28	.111793	8.00	.171954	9.18
29	.082944	8.28	.138977	9.43	29	.112273	8.00	.172505	9.20
30	9.083441	8.30	9.139543	9.43	30	9.112753	8.00	9.173057	9.18
31	.083939	8.28	.140109	9.42	31	.113233	8.00	.173608	9.18
32	.084436	8.27	.140674	9.43	32	.113713	7.98	.174159	9.18
33	.084932	8.28	.141240	9.42	33	.114192	7.98	.174710	9.17
34	.085429	8.27	.141805	9.42	34	.114671	7.97	.175260	9.17
35	9.085925	8.25	9.142370	9.40	35	9.115149	7.97	9.175810	9.17
36	.086420	8.27	.142934	9.42	36	.115627	7.97	.176360	9.17
37	.086916	8.25	.143499	9.40	37	.116105	7.97	.176910	9.17
38	.087411	8.25	.144063	9.40	38	.116583	7.97	.177460	9.15
39	.087906	8.23	.144627	9.38	39	.117061	7.95	.178009	9.15
40	9.088400	8.25	9.145190	9.40	40	9.117538	7.95	9.178558	9.15
41	.088895	8.23	.145754	9.38	41	.118015	7.93	.179107	9.15
42	.089389	8.22	.146317	9.38	42	.118491	7.95	.179656	9.13
43	.089882	8.23	.146880	9.37	43	.118968	7.93	.180204	9.13
44	.090376	8.22	.147442	9.38	44	.119444	7.92	.180752	9.13
45	9.090869	8.22	9.148005	9.37	45	9.119919	7.93	9.181300	9.13
46	.091362	8.20	.148567	9.37	46	.120395	7.92	.181848	9.12
47	.091854	8.20	.149129	9.35	47	.120870	7.92	.182395	9.13
48	.092346	8.20	.149690	9.35	48	.121345	7.92	.182943	9.12
49	.092838	8.20	.150251	9.37	49	.121820	7.90	.183490	9.10
50	9.093330	8.18	9.150813	9.33	50	9.122294	7.90	9.184036	9.12
51	.093821	8.18	.151373	9.35	51	.122768	7.90	.184583	9.10
52	.094312	8.18	.151934	9.33	52	.123242	7.88	.185129	9.10
53	.094803	8.17	.152494	9.35	53	.123715	7.90	.185675	9.10
54	.095293	8.17	.153055	9.32	54	.124189	7.88	.186221	9.10
55	9.095783	8.17	9.153614	9.33	55	9.124662	7.87	9.186767	9.08
56	.096273	8.17	.154174	9.32	56	.125134	7.88	.187312	9.10
57	.096763	8.15	.154733	9.33	57	.125607	7.87	.187858	9.08
58	.097252	8.15	.155293	9.30	58	.126079	7.87	.188403	9.07
59	.097741	8.13	.155851	9.32	59	.126551	7.85	.188947	9.08
60	9.098229		9.156410		60	9.127022		9.189492	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

30°					31°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 127022		9. 189492		0	9. 154828		9. 221762	
		7. 87		9. 07			7. 58		8. 85
1	. 127494	7. 85	. 190036	9. 07	1	. 155283	7. 58	. 222293	8. 87
2	. 127965	7. 85	. 190580	9. 07	2	. 155738	7. 58	. 222825	8. 83
3	. 128436	7. 83	. 191124	9. 07	3	. 156193	7. 58	. 223355	8. 85
4	. 128906	7. 83	. 191668	9. 05	4	. 156648	7. 57	. 223886	8. 85
5	9. 129376	7. 83	9. 192211	9. 05	5	9. 157102	7. 57	9. 224417	8. 83
6	. 129846	7. 83	. 192754	9. 05	6	. 157556	7. 57	. 224947	8. 83
7	. 130316	7. 82	. 193297	9. 05	7	. 158010	7. 57	. 225477	8. 83
8	. 130785	7. 83	. 193840	9. 03	8	. 158464	7. 55	. 226007	8. 83
9	. 131255	7. 82	. 194382	9. 05	9	. 158917	7. 55	. 226537	8. 82
10	9. 131724		9. 194925		10	9. 159370		9. 227066	
		7. 80		9. 03			7. 55		8. 82
11	. 132192	7. 80	. 195467	9. 03	11	. 159823	7. 55	. 227595	8. 83
12	. 132660	7. 82	. 196009	9. 02	12	. 160276	7. 53	. 228125	8. 80
13	. 133129	7. 78	. 196550	9. 03	13	. 160728	7. 53	. 228653	8. 82
14	. 133596	7. 80	. 197092	9. 02	14	. 161180	7. 53	. 229182	8. 82
15	9. 134064	7. 78	9. 197633	9. 02	15	9. 161632	7. 52	9. 229711	8. 80
16	. 134531	7. 78	. 198174	9. 02	16	. 162083	7. 53	. 230239	8. 80
17	. 134998	7. 78	. 198715	9. 00	17	. 162535	7. 52	. 230767	8. 80
18	. 135465	7. 77	. 199255	9. 00	18	. 162986	7. 52	. 231295	8. 78
19	. 135931	7. 77	. 199795	9. 00	19	. 163437	7. 50	. 231822	8. 80
20	9. 136397		9. 200335		20	9. 163887		9. 232350	
		7. 77		9. 00			7. 52		8. 78
21	. 136863	7. 77	. 200875	9. 00	21	. 164338	7. 50	. 232877	8. 78
22	. 137329	7. 75	. 201415	8. 98	22	. 164788	7. 48	. 233404	8. 78
23	. 137794	7. 77	. 201954	9. 00	23	. 165237	7. 50	. 233931	8. 78
24	. 138260	7. 73	. 202494	8. 98	24	. 165687	7. 48	. 234458	8. 77
25	9. 138724	7. 75	9. 203033	8. 97	25	9. 166136	7. 48	9. 234984	8. 77
26	. 139189	7. 73	. 203571	8. 98	26	. 166585	7. 48	. 235510	8. 77
27	. 139653	7. 73	. 204110	8. 97	27	. 167034	7. 48	. 236036	8. 77
28	. 140117	7. 73	. 204648	8. 97	28	. 167483	7. 47	. 236562	8. 77
29	. 140581	7. 73	. 205186	8. 97	29	. 167931	7. 47	. 237088	8. 75
30	9. 141045		9. 205724		30	9. 168379		9. 237613	
		7. 72		8. 97			7. 47		8. 77
31	. 141508	7. 72	. 206262	8. 95	31	. 168827	7. 47	. 238139	8. 75
32	. 141971	7. 72	. 206799	8. 97	32	. 169275	7. 45	. 238664	8. 75
33	. 142434	7. 70	. 207337	8. 95	33	. 169722	7. 45	. 239189	8. 73
34	. 142896	7. 70	. 207874	8. 93	34	. 170169	7. 45	. 239713	8. 75
35	9. 143358	7. 70	9. 208410	8. 95	35	9. 170616	7. 43	9. 240238	8. 73
36	. 143820	7. 70	. 208947	8. 93	36	. 171062	7. 45	. 240762	8. 73
37	. 144282	7. 68	. 209483	8. 95	37	. 171509	7. 43	. 241286	8. 73
38	. 144743	7. 68	. 210020	8. 93	38	. 171955	7. 42	. 241810	8. 72
39	. 145204	7. 68	. 210556	8. 92	39	. 172400	7. 43	. 242333	8. 73
40	9. 145665		9. 211091		40	9. 172846		9. 242857	
		7. 68		8. 93			7. 42		8. 72
41	. 146126	7. 67	. 211627	8. 92	41	. 173291	7. 42	. 243380	8. 72
42	. 146586	7. 67	. 212162	8. 92	42	. 173736	7. 42	. 243903	8. 72
43	. 147046	7. 67	. 212697	8. 92	43	. 174181	7. 42	. 244426	8. 72
44	. 147506	7. 67	. 213232	8. 92	44	. 174626	7. 40	. 244949	8. 70
45	9. 147966	7. 65	9. 213767	8. 90	45	9. 175070	7. 40	9. 245471	8. 72
46	. 148425	7. 65	. 214301	8. 92	46	. 175514	7. 40	. 245994	8. 70
47	. 148884	7. 65	. 214836	8. 90	47	. 175958	7. 40	. 246516	8. 70
48	. 149343	7. 63	. 215370	8. 90	48	. 176402	7. 38	. 247038	8. 68
49	. 149801	7. 63	. 215904	8. 88	49	. 176845	7. 38	. 247559	8. 70
50	9. 150259		9. 216437		50	9. 177288		9. 248081	
		7. 63		8. 90			7. 38		8. 68
51	. 150717	7. 63	. 216971	8. 88	51	. 177731	7. 38	. 248602	8. 68
52	. 151175	7. 63	. 217504	8. 88	52	. 178174	7. 37	. 249123	8. 68
53	. 151633	7. 62	. 218037	8. 88	53	. 178616	7. 37	. 249644	8. 68
54	. 152090	7. 62	. 218570	8. 87	54	. 179058	7. 37	. 250165	8. 68
55	9. 152547	7. 60	9. 219102	8. 88	55	9. 179500	7. 37	9. 250686	8. 67
56	. 153003	7. 62	. 219635	8. 87	56	. 179942	7. 35	. 251206	8. 67
57	. 153460	7. 60	. 220167	8. 87	57	. 180383	7. 37	. 251726	8. 67
58	. 153916	7. 60	. 220699	8. 87	58	. 180825	7. 33	. 252246	8. 67
59	. 154372	7. 60	. 221231	8. 85	59	. 181265	7. 35	. 252766	8. 67
60	9. 154828		9. 221762		60	9. 181706		9. 253286	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

32°					33°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 181706		9. 253286		0	9. 207714		9. 284122	
1	. 182147	7. 35	. 253805	8. 65	1	. 208140	7. 10	. 284631	8. 48
2	. 182587	7. 33	. 254324	8. 65	2	. 208566	7. 10	. 285139	8. 47
3	. 183027	7. 33	. 254843	8. 65	3	. 208992	7. 10	. 285647	8. 47
4	. 183466	7. 32	. 255362	8. 65	4	. 209418	7. 10	. 286155	8. 47
5	9. 183906	7. 33	9. 255881	8. 65	5	9. 209843	7. 08	9. 286663	8. 47
6	. 184345	7. 32	. 256399	8. 63	6	. 210268	7. 08	. 287170	8. 45
7	. 184784	7. 32	. 256818	8. 65	7	. 210693	7. 08	. 287678	8. 47
8	. 185223	7. 32	. 257436	8. 63	8	. 211118	7. 08	. 288185	8. 45
9	. 185662	7. 30	. 257954	8. 63	9	211543	7. 07	. 288692	8. 45
10	9. 186100		9. 258471	8. 62	10	9. 211967		9. 289199	
11	. 186538	7. 30	. 258989	8. 63	11	. 212391	7. 07	. 289705	8. 43
12	. 186976	7. 30	. 259506	8. 62	12	. 212815	7. 07	. 290212	8. 45
13	. 187413	7. 28	. 260023	8. 62	13	. 213239	7. 07	. 290718	8. 43
14	. 187851	7. 30	. 260540	8. 62	14	. 213662	7. 05	. 291224	8. 43
15	9. 188288	7. 28	9. 261057	8. 62	15	9. 214085	7. 05	9. 291730	8. 43
16	. 188724	7. 27	. 261574	8. 60	16	. 214508	7. 05	. 292236	8. 43
17	. 189161	7. 28	. 262090	8. 60	17	. 214931	7. 05	. 292742	8. 43
18	. 189597	7. 27	. 262606	8. 60	18	. 215354	7. 03	. 293247	8. 42
19	. 190034	7. 28	. 263122	8. 60	19	. 215776	7. 03	. 293753	8. 43
20	9. 190469	7. 25	9. 263638	8. 60	20	9. 216198	7. 03	9. 294258	8. 42
21	. 190905	7. 27	. 264154	8. 58	21	. 216620	7. 03	. 294763	8. 42
22	. 191341	7. 27	. 264669	8. 58	22	. 217042	7. 02	. 295268	8. 40
23	. 191776	7. 25	. 265184	8. 60	23	. 217463	7. 02	. 295772	8. 42
24	. 192211	7. 25	. 265700	8. 57	24	. 217884	7. 02	. 296277	8. 40
25	9. 192645	7. 23	9. 266214	8. 58	25	9. 218305	7. 02	9. 296781	8. 40
26	. 193080	7. 25	. 266729	8. 58	26	. 218726	7. 00	. 297285	8. 40
27	. 193514	7. 23	. 267244	8. 57	27	. 219146	7. 02	. 297789	8. 40
28	. 193948	7. 23	. 267758	8. 57	28	. 219567	7. 00	. 298293	8. 40
29	. 194382	7. 22	. 268272	8. 57	29	. 219987	7. 00	. 298797	8. 38
30	9. 194815	7. 23	9. 268786	8. 57	30	9. 220407	6. 98	9. 299300	8. 38
31	. 195249	7. 22	. 269300	8. 57	31	. 220826	7. 00	. 299803	8. 40
32	. 195682	7. 22	. 269814	8. 55	32	. 221246	6. 98	. 300307	8. 37
33	. 196115	7. 20	. 270327	8. 55	33	. 221665	6. 98	. 300809	8. 38
34	. 196547	7. 22	. 270840	8. 57	34	. 222084	6. 98	. 301312	8. 38
35	9. 196980	7. 20	9. 271354	8. 53	35	9. 222503	6. 97	9. 301815	8. 37
36	. 197412	7. 20	. 271866	8. 55	36	. 222921	6. 98	. 302317	8. 38
37	. 197844	7. 18	. 272379	8. 55	37	. 223340	6. 97	. 302820	8. 37
38	. 198275	7. 20	. 272892	8. 53	38	. 223758	6. 97	. 303322	8. 37
39	. 198707	7. 18	. 273404	8. 53	39	. 224176	6. 95	. 303824	8. 35
40	9. 199138	7. 18	9. 273916	8. 53	40	9. 224593	6. 97	9. 304325	8. 37
41	. 199569	7. 18	. 274428	8. 53	41	. 225011	6. 95	. 304827	8. 35
42	. 200000	7. 17	. 274940	8. 53	42	. 225428	6. 95	. 305328	8. 37
43	. 200430	7. 18	. 275452	8. 52	43	. 225845	6. 95	. 305830	8. 35
44	. 200861	7. 17	. 275963	8. 52	44	. 226262	6. 93	. 306331	8. 35
45	9. 201291	7. 15	9. 276474	8. 53	45	9. 226678	6. 95	9. 306832	8. 35
46	. 201720	7. 17	. 276986	8. 50	46	. 227095	6. 93	. 307333	8. 33
47	. 202150	7. 15	. 277496	8. 52	47	. 227511	6. 93	. 307833	8. 35
48	. 202579	7. 15	. 278007	8. 52	48	. 227927	6. 92	. 308334	8. 33
49	. 203008	7. 15	. 278518	8. 50	49	. 228342	6. 93	. 308834	8. 33
50	9. 203437	7. 15	9. 279028	8. 50	50	9. 228758	6. 92	9. 309334	8. 33
51	. 203866	7. 13	. 279538	8. 50	51	. 229173	6. 92	. 309834	8. 33
52	. 204294	7. 15	. 280048	8. 50	52	. 229588	6. 92	. 310334	8. 33
53	. 204723	7. 13	. 280558	8. 50	53	. 230003	6. 92	. 310834	8. 32
54	. 205151	7. 12	. 281068	8. 48	54	. 230418	6. 90	. 311333	8. 32
55	9. 205578	7. 13	9. 281577	8. 50	55	9. 230832	6. 90	9. 311832	8. 32
56	. 206006	7. 12	. 282087	8. 48	56	. 231246	6. 90	. 312331	8. 32
57	. 206433	7. 12	. 282596	8. 48	57	. 231660	6. 90	. 312830	8. 32
58	. 206860	7. 12	. 283105	8. 48	58	. 232074	6. 88	. 313329	8. 32
59	. 207287	7. 12	. 283614	8. 47	59	. 232487	6. 90	. 313828	8. 30
60	9. 207714		9. 284122		60	9. 232901		9. 314326	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

34°					35°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 232901		9. 314326		0	9. 257314		9. 343949	
1	. 233314	6. 88	. 314825	8. 32	1	. 257714	6. 67	. 344438	8. 15
2	. 233727	6. 88	. 315323	8. 30	2	. 258115	6. 68	. 344927	8. 15
3	. 234139	6. 87	. 315821	8. 30	3	. 258515	6. 67	. 345416	8. 15
4	. 234552	6. 88	. 316319	8. 30	4	. 258915	6. 67	. 345904	8. 13
5	9. 234964	6. 87	9. 316817	8. 28	5	9. 259314	6. 65	9. 346393	8. 15
6	. 235376	6. 87	. 317314	8. 28	6	. 259714	6. 67	. 346881	8. 13
7	. 235788	6. 87	. 317811	8. 30	7	. 260113	6. 65	. 347369	8. 13
8	. 236199	6. 85	. 318309	8. 28	8	. 260512	6. 65	. 347857	8. 13
9	. 236611	6. 87	. 318806	8. 28	9	. 260911	6. 65	. 348345	8. 13
10	9. 237022	6. 85	9. 319303	8. 27	10	9. 261310	6. 65	9. 348833	8. 13
11	. 237433	6. 85	. 319799	8. 28	11	. 261709	6. 63	. 349321	8. 12
12	. 237844	6. 83	. 320296	8. 27	12	. 262107	6. 63	. 349808	8. 12
13	. 238254	6. 85	. 320792	8. 28	13	. 262505	6. 63	. 350295	8. 12
14	. 238665	6. 83	. 321289	8. 27	14	. 262903	6. 63	. 350782	8. 12
15	9. 239075	6. 83	9. 321785	8. 27	15	9. 263301	6. 62	9. 351269	8. 12
16	. 239485	6. 82	. 322281	8. 25	16	. 263698	6. 63	. 351756	8. 12
17	. 239894	6. 83	. 322776	8. 27	17	. 264096	6. 62	. 352243	8. 12
18	. 240304	6. 82	. 323272	8. 27	18	. 264493	6. 62	. 352730	8. 10
19	. 240713	6. 82	. 323768	8. 25	19	. 264890	6. 62	. 353216	8. 10
20	9. 241122	6. 82	9. 324263	8. 25	20	9. 265287	6. 60	9. 353702	8. 10
21	. 241531	6. 82	. 324758	8. 25	21	. 265683	6. 62	. 354188	8. 10
22	. 241940	6. 80	. 325253	8. 25	22	. 266080	6. 60	. 354674	8. 10
23	. 242348	6. 80	. 325748	8. 25	23	. 266476	6. 60	. 355160	8. 10
24	. 242756	6. 80	. 326243	8. 23	24	. 266872	6. 58	. 355646	8. 08
25	9. 243164	6. 80	9. 326737	8. 25	25	9. 267267	6. 60	9. 356131	8. 10
26	. 243572	6. 80	. 327232	8. 23	26	. 267663	6. 58	. 356617	8. 08
27	. 243980	6. 78	. 327726	8. 23	27	. 268058	6. 58	. 357102	8. 08
28	. 244387	6. 78	. 328220	8. 23	28	. 268453	6. 58	. 357587	8. 08
29	. 244794	6. 78	. 328714	8. 22	29	. 268848	6. 58	. 358072	8. 08
30	9. 245201	6. 78	9. 329207	8. 23	30	9. 269243	6. 58	9. 358557	8. 08
31	. 245608	6. 77	. 329701	8. 23	31	. 269638	6. 57	. 359042	8. 07
32	. 246014	6. 78	. 330195	8. 22	32	. 270032	6. 57	. 359526	8. 08
33	. 246421	6. 77	. 330688	8. 22	33	. 270426	6. 57	. 360011	8. 07
34	. 246827	6. 77	. 331181	8. 22	34	. 270820	6. 57	. 360495	8. 07
35	9. 247233	6. 77	9. 331674	8. 22	35	9. 271214	6. 57	9. 360979	8. 07
36	. 247639	6. 75	. 332167	8. 20	36	. 271608	6. 55	. 361463	8. 07
37	. 248044	6. 75	. 332659	8. 22	37	. 272001	6. 55	. 361947	8. 07
38	. 248449	6. 75	. 333152	8. 20	38	. 272394	6. 55	. 362431	8. 05
39	. 248854	6. 75	. 333644	8. 22	39	. 272787	6. 55	. 362914	8. 07
40	9. 249259	6. 75	9. 334137	8. 20	40	9. 273180	6. 53	9. 363398	8. 05
41	. 249664	6. 73	. 334629	8. 20	41	. 273572	6. 55	. 363881	8. 05
42	. 250068	6. 75	. 335121	8. 18	42	. 273965	6. 53	. 364364	8. 05
43	. 250473	6. 73	. 335612	8. 20	43	. 274357	6. 53	. 364847	8. 05
44	. 250877	6. 73	. 336104	8. 18	44	. 274749	6. 53	. 365330	8. 05
45	9. 251281	6. 72	9. 336595	8. 20	45	9. 275141	6. 52	9. 365813	8. 03
46	. 251684	6. 73	. 337087	8. 18	46	. 275532	6. 53	. 366295	8. 05
47	. 252088	6. 72	. 337578	8. 18	47	. 275924	6. 52	. 366778	8. 03
48	. 252491	6. 72	. 338069	8. 18	48	. 276315	6. 52	. 367260	8. 03
49	. 252894	6. 72	. 338560	8. 17	49	. 276706	6. 52	. 367742	8. 03
50	9. 253297	6. 70	9. 339050	8. 18	50	9. 277097	6. 52	9. 368224	8. 03
51	. 253699	6. 72	. 339541	8. 17	51	. 277488	6. 50	. 368706	8. 03
52	. 254102	6. 70	. 340031	8. 18	52	. 277878	6. 50	. 369188	8. 03
53	. 254504	6. 70	. 340522	8. 17	53	. 278268	6. 50	. 369670	8. 02
54	. 254906	6. 70	. 341012	8. 17	54	. 278658	6. 50	. 370151	8. 02
55	9. 255308	6. 68	9. 341502	8. 15	55	9. 279048	6. 50	9. 370632	8. 03
56	. 255709	6. 70	. 341991	8. 17	56	. 279438	6. 48	. 371114	8. 02
57	. 256111	6. 68	. 342481	8. 17	57	. 279827	6. 50	. 371595	8. 02
58	. 256512	6. 68	. 342971	8. 15	58	. 280217	6. 48	. 372076	8. 00
59	. 256913	6. 68	. 343460	8. 15	59	. 280606	6. 48	. 372556	8. 02
60	9. 257314		9. 343949		60	9. 280995		9. 373037	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

36°					37°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 280995		9. 373037		0	9. 303983		9. 401634	
		6. 47		8. 02			6. 28		7. 88
1	. 281383		. 373518		1	. 304360		. 402107	
		6. 48		8. 00			6. 30		7. 88
2	. 281772		. 373998		2	. 304738		. 402580	
		6. 47		8. 00			6. 28		7. 87
3	. 282160		. 374478		3	. 305115		. 403052	
		6. 47		8. 00			6. 28		7. 87
4	. 282548		. 374958		4	. 305492		. 403524	
		6. 47		8. 00			6. 27		7. 88
5	9. 282936		9. 375438		5	9. 305868		9. 403997	
		6. 47		8. 00			6. 28		7. 87
6	. 283324		. 375918		6	. 306245		. 404469	
		6. 47		8. 00			6. 27		7. 87
7	. 283712		. 376398		7	. 306621		. 404941	
		6. 45		7. 98			6. 28		7. 85
8	. 284099		. 376877		8	. 306998		. 405412	
		6. 45		8. 00			6. 27		7. 87
9	. 284486		. 377357		9	. 307374		. 405884	
		6. 45		7. 98			6. 25		7. 87
10	9. 284873		9. 377836		10	9. 307749		9. 406356	
		6. 45		7. 98			6. 27		7. 85
11	. 285260		. 378315		11	. 308125		. 406827	
		6. 45		7. 98			6. 27		7. 85
12	. 285647		. 378794		12	. 308501		. 407298	
		6. 43		7. 98			6. 25		7. 87
13	. 286033		. 379273		13	. 308876		. 407770	
		6. 43		7. 98			6. 25		7. 85
14	. 286419		. 379752		14	. 309251		. 408241	
		6. 43		7. 98			6. 25		7. 85
15	9. 286805		9. 380231		15	9. 309626		9. 408712	
		6. 43		7. 97			6. 25		7. 85
16	. 287191		. 380709		16	. 310001		. 409183	
		6. 43		7. 98			6. 23		7. 83
17	. 287577		. 381188		17	. 310375		. 409653	
		6. 42		7. 97			6. 25		7. 85
18	. 287962		. 381666		18	. 310750		. 410124	
		6. 43		7. 97			6. 23		7. 83
19	. 288348		. 382144		19	. 311124		. 410594	
		6. 42		7. 97			6. 23		7. 85
20	9. 288733		9. 382622		20	9. 311498		9. 411065	
		6. 42		7. 97			6. 23		7. 83
21	. 289118		. 383100		21	. 311872		. 411535	
		6. 40		7. 95			6. 22		7. 83
22	. 289502		. 383577		22	. 312245		. 412005	
		6. 42		7. 97			6. 23		7. 83
23	. 289887		. 384055		23	. 312619		. 412475	
		6. 40		7. 95			6. 22		7. 83
24	. 290271		. 384532		24	. 312992		. 412945	
		6. 40		7. 97			6. 22		7. 83
25	9. 290655		9. 385010		25	9. 313365		9. 413415	
		6. 40		7. 95			6. 22		7. 82
26	. 291039		. 385487		26	. 313738		. 413884	
		6. 40		7. 95			6. 22		7. 83
27	. 291423		. 385964		27	. 314111		. 414354	
		6. 40		7. 95			6. 22		7. 82
28	. 291807		. 386441		28	. 314484		. 414823	
		6. 38		7. 95			6. 20		7. 83
29	. 292190		. 386918		29	. 314856		. 415293	
		6. 38		7. 93			6. 20		7. 82
30	9. 292573		9. 387394		30	9. 315228		9. 415762	
		6. 38		7. 95			6. 20		7. 82
31	. 292956		. 387871		31	. 315600		. 416231	
		6. 38		7. 93			6. 20		7. 82
32	. 293339		. 388347		32	. 315972		. 416700	
		6. 38		7. 95			6. 20		7. 80
33	. 293722		. 388824		33	. 316344		. 417168	
		6. 37		7. 93			6. 20		7. 82
34	. 294104		. 389300		34	. 316716		. 417637	
		6. 37		7. 93			6. 18		7. 82
35	9. 294486		9. 389776		35	9. 317087		9. 418106	
		6. 37		7. 93			6. 18		7. 80
36	. 294868		. 390252		36	. 317458		. 418574	
		6. 37		7. 92			6. 18		7. 80
37	. 295250		. 390727		37	. 317829		. 419042	
		6. 37		7. 93			6. 18		7. 82
38	. 295632		. 391203		38	. 318200		. 419511	
		6. 37		7. 92			6. 18		7. 80
39	. 296014		. 391678		39	. 318571		. 419979	
		6. 35		7. 93			6. 17		7. 80
40	9. 296395		9. 392154		40	9. 318941		9. 420447	
		6. 35		7. 92			6. 17		7. 80
41	. 296776		. 392629		41	. 319311		. 420915	
		6. 35		7. 92			6. 18		7. 78
42	. 297157		. 393104		42	. 319682		. 421382	
		6. 35		7. 92			6. 15		7. 80
43	. 297538		. 393579		43	. 320051		. 421850	
		6. 33		7. 92			6. 17		7. 78
44	. 297918		. 394054		44	. 320421		. 422317	
		6. 35		7. 92			6. 17		7. 80
45	9. 298299		9. 394529		45	9. 320791		9. 422785	
		6. 33		7. 90			6. 15		7. 78
46	. 298679		. 395003		46	. 321160		. 423252	
		6. 33		7. 92			6. 17		7. 78
47	. 299059		. 395478		47	. 321530		. 423719	
		6. 33		7. 90			6. 15		7. 78
48	. 299439		. 395952		48	. 321899		. 424186	
		6. 33		7. 90			6. 13		7. 78
49	. 299819		. 396426		49	. 322267		. 424653	
		6. 32		7. 90			6. 15		7. 78
50	9. 300198		9. 396900		50	9. 322636		9. 425120	
		6. 32		7. 90			6. 15		7. 78
51	. 300577		. 397374		51	. 323005		. 425587	
		6. 33		7. 90			6. 13		7. 77
52	. 300957		. 397848		52	. 323373		. 426053	
		6. 30		7. 90			6. 13		7. 78
53	. 301335		. 398322		53	. 323741		. 426520	
		6. 32		7. 88			6. 13		7. 77
54	. 301714		. 398795		54	. 324109		. 426986	
		6. 32		7. 90			6. 13		7. 77
55	9. 302093		9. 399269		55	9. 324477		9. 427452	
		6. 30		7. 88			6. 13		7. 77
56	. 302471		. 399742		56	. 324845		. 427918	
		6. 30		7. 88			6. 12		7. 77
57	. 302849		. 400215		57	. 325212		. 428384	
		6. 30		7. 88			6. 13		7. 77
58	. 303227		. 400688		58	. 325580		. 428850	
		6. 30		7. 88			6. 12		7. 77
59	. 303605		. 401161		59	. 325947		. 429316	
		6. 30		7. 88			6. 12		7. 77
60	9. 303983		9. 401634		60	9. 326314		9. 429782	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

38°					39°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.326314		9.429782		0	9.348021		9.457518	
1	.326681	6.12	.430247	7.75	1	.348377	5.93	.457977	7.65
2	.327047	6.10	.430713	7.77	2	.348734	5.95	.458436	7.65
3	.327414	6.12	.431178	7.75	3	.349090	5.93	.458895	7.65
4	.327780	6.10	.431643	7.75	4	.349446	5.93	.459353	7.63
5	9.328146	6.10	9.432108	7.75	5	9.349802	5.93	9.459812	7.65
6	.328512	6.10	.432573	7.75	6	.350158	5.93	.460270	7.63
7	.328878	6.08	.433038	7.75	7	.350514	5.93	.460729	7.65
8	.329243	6.10	.433503	7.73	8	.350869	5.92	.461187	7.63
9	.329609	6.08	.433967	7.75	9	.351225	5.93	.461645	7.63
10	9.329974	6.08	9.434432	7.73	10	9.351580	5.92	9.462103	7.63
11	.330339	6.08	.434896	7.75	11	.351935	5.92	.462561	7.63
12	.330704	6.08	.435361	7.73	12	.352290	5.90	.463019	7.63
13	.331069	6.07	.435825	7.73	13	.352644	5.92	.463477	7.62
14	.331433	6.08	.436289	7.73	14	.352999	5.90	.463934	7.63
15	9.331798	6.07	9.436753	7.73	15	9.353353	5.90	9.464392	7.62
16	.332162	6.07	.437217	7.72	16	.353707	5.92	.464849	7.63
17	.332526	6.07	.437680	7.73	17	.354062	5.88	.465307	7.62
18	.332890	6.07	.438144	7.73	18	.354415	5.90	.465764	7.62
19	.333254	6.05	.438608	7.72	19	.354769	5.90	.466221	7.62
20	9.333617	6.07	9.439071	7.72	20	9.355123	5.88	9.466678	7.62
21	.333981	6.05	.439534	7.72	21	.355476	5.88	.467135	7.62
22	.334344	6.05	.439997	7.72	22	.355829	5.88	.467592	7.62
23	.334707	6.05	.440460	7.72	23	.356182	5.88	.468049	7.62
24	.335070	6.03	.440923	7.72	24	.356535	5.88	.468506	7.60
25	9.335432	6.05	9.441386	7.72	25	9.356888	5.88	9.468962	7.60
26	.335795	6.03	.441849	7.72	26	.357241	5.87	.469418	7.62
27	.336157	6.03	.442312	7.70	27	.357593	5.87	.469875	7.60
28	.336519	6.03	.442774	7.72	28	.357945	5.87	.470331	7.60
29	.336881	6.03	.443237	7.70	29	.358297	5.87	.470787	7.60
30	9.337243	6.03	9.443699	7.70	30	9.358649	5.87	9.471243	7.60
31	.337605	6.02	.444161	7.70	31	.359001	5.87	.471699	7.60
32	.337966	6.03	.444623	7.70	32	.359353	5.85	.472155	7.60
33	.338328	6.02	.445085	7.70	33	.359704	5.87	.472611	7.60
34	.338689	6.02	.445547	7.70	34	.360056	5.85	.473067	7.58
35	9.339050	6.02	9.446009	7.68	35	9.360407	5.85	9.473522	7.60
36	.339411	6.00	.446470	7.70	36	.360758	5.83	.473978	7.58
37	.339771	6.02	.446932	7.68	37	.361108	5.85	.474433	7.58
38	.340132	6.00	.447393	7.70	38	.361459	5.85	.474888	7.58
39	.340492	6.00	.447855	7.68	39	.361810	5.83	.475343	7.58
40	9.340852	6.00	9.448316	7.68	40	9.362160	5.83	9.475798	7.58
41	.341212	6.00	.448777	7.68	41	.362510	5.83	.476253	7.58
42	.341572	6.00	.449238	7.68	42	.362860	5.83	.476708	7.58
43	.341932	5.98	.449699	7.68	43	.363210	5.83	.477163	7.58
44	.342291	6.00	.450160	7.67	44	.363560	5.82	.477618	7.57
45	9.342651	5.98	9.450620	7.68	45	9.363909	5.83	9.478072	7.58
46	.343010	5.98	.451081	7.67	46	.364259	5.82	.478527	7.57
47	.343369	5.98	.451541	7.68	47	.364608	5.82	.478981	7.57
48	.343728	5.97	.452002	7.67	48	.364957	5.82	.479435	7.58
49	.344086	5.98	.452462	7.67	49	.365306	5.82	.479890	7.57
50	9.344445	5.97	9.452922	7.67	50	9.365655	5.80	9.480344	7.57
51	.344803	5.97	.453382	7.67	51	.366003	5.82	.480798	7.57
52	.345161	5.97	.453842	7.67	52	.366352	5.80	.481252	7.55
53	.345519	5.97	.454302	7.67	53	.366700	5.80	.481705	7.57
54	.345877	5.97	.454762	7.65	54	.367048	5.80	.482159	7.57
55	9.346235	5.95	9.455221	7.67	55	9.367396	5.80	9.482613	7.55
56	.346592	5.97	.455681	7.65	56	.367744	5.78	.483066	7.57
57	.346950	5.95	.456140	7.67	57	.368091	5.80	.483520	7.55
58	.347307	5.95	.456600	7.65	58	.368439	5.78	.483973	7.55
59	.347664	5.95	.457059	7.65	59	.368786	5.78	.484426	7.55
60	9.348021		9.457518		60	9.369133		9.484879	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

40°					41°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 369133		9. 484879		0	9. 389681		9. 511901	
1	. 369480	5. 78	. 485332	7. 55	1	. 390018	5. 62	. 512348	7. 45
2	. 369827	5. 78	. 485785	7. 55	2	. 390356	5. 63	. 512796	7. 47
3	. 370174	5. 78	. 486238	7. 55	3	. 390694	5. 63	. 513243	7. 45
4	. 370520	5. 77	. 486691	7. 55	4	. 391031	5. 62	. 513691	7. 47
5	9. 370867	5. 78	9. 487144	7. 53	5	9. 391368	5. 62	9. 514138	7. 45
6	. 371213	5. 77	. 487596	7. 55	6	. 391705	5. 62	. 514585	7. 45
7	. 371559	5. 77	. 488049	7. 53	7	. 392042	5. 62	. 515033	7. 47
8	. 371905	5. 77	. 488501	7. 53	8	. 392379	5. 62	. 515480	7. 45
9	. 372251	5. 75	. 488953	7. 55	9	. 392716	5. 60	. 515927	7. 45
10	9. 372596	5. 77	9. 489406	7. 53	10	9. 393052	5. 60	9. 516374	7. 43
11	. 372942	5. 75	. 489858	7. 53	11	. 393388	5. 60	. 516820	7. 45
12	. 373287	5. 75	. 490310	7. 53	12	. 393724	5. 62	. 517267	7. 45
13	. 373632	5. 75	. 490762	7. 53	13	. 394061	5. 58	. 517714	7. 43
14	. 373977	5. 75	. 491214	7. 52	14	. 394396	5. 60	. 518160	7. 45
15	9. 374322	5. 75	9. 491665	7. 53	15	9. 394732	5. 60	9. 518607	7. 43
16	. 374667	5. 73	. 492117	7. 53	16	. 395068	5. 58	. 519053	7. 45
17	. 375011	5. 75	. 492569	7. 52	17	. 395403	5. 58	519500	7. 43
18	. 375356	5. 73	. 493020	7. 52	18	. 395738	5. 60	. 519946	7. 43
19	. 375700	5. 73	. 493471	7. 53	19	. 396074	5. 58	. 520392	7. 43
20	9. 376044	5. 73	9. 493923	7. 52	20	9. 396409	5. 57	9. 520838	7. 43
21	. 376388	5. 73	. 494374	7. 52	21	. 396743	5. 58	. 521284	7. 43
22	. 376732	5. 72	. 494825	7. 52	22	. 397078	5. 58	. 521730	7. 43
23	. 377075	5. 73	. 495276	7. 52	23	. 397413	5. 57	. 522176	7. 42
24	. 377419	5. 72	. 495727	7. 52	24	. 397747	5. 57	. 522621	7. 43
25	9. 377762	5. 72	9. 496178	7. 50	25	9. 398081	5. 57	9. 523067	7. 43
26	. 378105	5. 72	. 496628	7. 52	26	. 398415	5. 57	. 523513	7. 42
27	. 378448	5. 72	. 497079	7. 52	27	. 398749	5. 57	. 523958	7. 43
28	. 378791	5. 70	. 497530	7. 50	28	. 399083	5. 57	. 524404	7. 42
29	. 379133	5. 72	. 497980	7. 50	29	. 399417	5. 55	. 524849	7. 42
30	9. 379476	5. 70	9. 498430	7. 52	30	9. 399750	5. 57	9. 525294	7. 42
31	. 379818	5. 72	. 498881	7. 50	31	. 400084	5. 55	. 525739	7. 42
32	. 380161	5. 70	. 499331	7. 50	32	. 400417	5. 55	. 526184	7. 42
33	. 380503	5. 70	. 499781	7. 50	33	. 400750	5. 55	. 526629	7. 42
34	. 380845	5. 68	. 500231	7. 50	34	. 401083	5. 55	. 527074	7. 42
35	9. 381186	5. 70	9. 500681	7. 50	35	9. 401416	5. 53	9. 527519	7. 42
36	. 381528	5. 68	. 501131	7. 50	36	. 401748	5. 55	. 527964	7. 42
37	. 381869	5. 70	. 501581	7. 48	37	. 402081	5. 53	. 528409	7. 40
38	. 382211	5. 68	. 502030	7. 50	38	. 402413	5. 53	. 528853	7. 42
39	. 382552	5. 68	. 502480	7. 48	39	. 402745	5. 53	. 529298	7. 40
40	9. 382893	5. 68	9. 502929	7. 50	40	9. 403077	5. 53	9. 529742	7. 42
41	. 383234	5. 67	. 503379	7. 48	41	. 403409	5. 53	. 530187	7. 40
42	. 383574	5. 68	. 503828	7. 48	42	. 403741	5. 53	. 530631	7. 40
43	. 383915	5. 67	. 504277	7. 48	43	. 404073	5. 52	. 531075	7. 40
44	. 384255	5. 67	. 504726	7. 48	44	. 404404	5. 53	. 531519	7. 40
45	9. 384595	5. 67	9. 505175	7. 48	45	9. 404736	5. 52	9. 531963	7. 40
46	. 384935	5. 67	. 505624	7. 48	46	. 405067	5. 52	. 532407	7. 40
47	. 385275	5. 67	. 506073	7. 48	47	. 405398	5. 52	. 532851	7. 40
48	. 385615	5. 67	. 506522	7. 48	48	. 405729	5. 50	. 533295	7. 40
49	. 385955	5. 65	. 506971	7. 47	49	. 406059	5. 52	. 533739	7. 38
50	9. 386294	5. 67	9. 507419	7. 48	50	9. 406390	5. 52	9. 534182	7. 40
51	. 386634	5. 65	. 507868	7. 47	51	. 406721	5. 50	. 534626	7. 40
52	. 386973	5. 65	. 508316	7. 48	52	. 407051	5. 50	. 535070	7. 38
53	. 387312	5. 65	. 508765	7. 47	53	. 407381	5. 50	. 535513	7. 38
54	. 387651	5. 63	. 509213	7. 47	54	. 407711	5. 50	. 535956	7. 40
55	9. 387989	5. 65	9. 509661	7. 47	55	9. 408041	5. 50	9. 536400	7. 38
56	. 388328	5. 63	. 510109	7. 47	56	. 408371	5. 48	. 536843	7. 38
57	. 388666	5. 65	. 510557	7. 47	57	. 408700	5. 50	. 537286	7. 38
58	. 389005	5. 63	. 511005	7. 47	58	. 409030	5. 48	. 537729	7. 38
59	. 389343	5. 63	. 511453	7. 47	59	. 409359	5. 48	. 538172	7. 38
60	9. 389681		9. 511901		60	9. 409688		9. 538615	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

42°					43°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.409688		9.538615		0	9.429181		9.565053	
1	.410017	5.48	.539058	7.38	1	.429502	5.35	.565492	7.32
2	.410346	5.48	.539500	7.37	2	.429822	5.33	.565930	7.30
3	.410675	5.48	.539943	7.38	3	.430142	5.33	.566369	7.32
4	.411004	5.48	.540386	7.38	4	.430463	5.35	.566807	7.30
5	9.411332	5.47	9.540828	7.37	5	9.430783	5.33	9.567245	7.30
6	.411660	5.47	.541271	7.38	6	.431103	5.33	.567683	7.30
7	.411989	5.48	.541713	7.37	7	.431422	5.32	.568121	7.30
8	.412317	5.47	.542155	7.37	8	.431742	5.33	.568559	7.30
9	.412644	5.45	.542597	7.37	9	.432062	5.33	.568997	7.30
		5.47		7.38			5.32		7.30
10	9.412972		9.543040		10	9.432381		9.569435	
11	.413300	5.47	.543482	7.37	11	.432700	5.32	.569873	7.30
12	.413627	5.45	.543924	7.37	12	.433020	5.33	.570311	7.30
13	.413955	5.47	.544366	7.37	13	.433339	5.32	.570748	7.28
14	.414282	5.45	.544807	7.35	14	.433657	5.30	.571186	7.30
15	9.414609	5.45	9.545249	7.37	15	9.433976	5.32	9.571624	7.30
16	.414936	5.45	.545691	7.37	16	.434295	5.32	.572061	7.28
17	.415262	5.43	.546132	7.35	17	.434613	5.30	.572498	7.28
18	.415589	5.45	.546574	7.37	18	.434932	5.32	.572936	7.30
19	.415916	5.45	.547015	7.35	19	.435250	5.30	.573373	7.28
		5.43		7.37			5.30		7.28
20	9.416242		9.547457		20	9.435568		9.573810	
21	.416568	5.43	.547898	7.35	21	.435886	5.30	.574247	7.28
22	.416894	5.43	.548339	7.35	22	.436204	5.30	.574685	7.30
23	.417220	5.43	.548781	7.37	23	.436521	5.28	.575122	7.28
24	.417546	5.43	.549222	7.35	24	.436839	5.30	.575558	7.27
25	9.417871	5.42	9.549663	7.35	25	9.437156	5.28	9.575995	7.28
26	.418197	5.43	.550104	7.35	26	.437473	5.28	.576432	7.28
27	.418522	5.42	.550544	7.33	27	.437791	5.30	.576869	7.28
28	.418848	5.43	.550985	7.35	28	.438107	5.27	.577306	7.28
29	.419173	5.42	.551426	7.35	29	.438424	5.28	.577742	7.27
		5.42		7.35			5.28		7.28
30	9.419498		9.551867		30	9.438741		9.578179	
31	.419822	5.40	.552307	7.33	31	.439058	5.28	.578615	7.27
32	.420147	5.42	.552748	7.35	32	.439374	5.27	.579052	7.28
33	.420471	5.40	.553188	7.33	33	.439690	5.27	.579488	7.27
34	.420796	5.42	.553629	7.35	34	.440007	5.28	.579924	7.27
35	9.421120	5.40	9.554069	7.33	35	9.440323	5.27	9.580361	7.28
36	.421444	5.40	.554509	7.33	36	.440639	5.27	.580797	7.27
37	.421768	5.40	.554949	7.33	37	.440954	5.25	.581233	7.27
38	.422092	5.40	.555389	7.33	38	.441270	5.27	.581669	7.27
39	.422416	5.38	.555829	7.33	39	.441586	5.25	.582105	7.27
40	9.422739		9.556269		40	9.441901		9.582541	
41	.423063	5.40	.556709	7.33	41	.442216	5.25	.582977	7.27
42	.423386	5.38	.557149	7.33	42	.442531	5.25	.583413	7.27
43	.423709	5.38	.557589	7.33	43	.442846	5.25	.583848	7.25
44	.424032	5.38	.558028	7.32	44	.443161	5.25	.584284	7.27
45	9.424355	5.38	9.558468	7.33	45	9.443476	5.25	9.584720	7.27
46	.424677	5.37	.558907	7.32	46	.443790	5.23	.585155	7.25
47	.425000	5.38	.559347	7.33	47	.444105	5.25	.585591	7.27
48	.425322	5.37	.559786	7.32	48	.444419	5.23	.586026	7.25
49	.425645	5.38	.560226	7.33	49	.444733	5.23	.586462	7.27
		5.37		7.32			5.23		7.25
50	9.425967		9.560665		50	9.445047		9.586897	
51	.426289	5.37	.561104	7.32	51	.445361	5.23	.587332	7.25
52	.426611	5.37	.561543	7.32	52	.445675	5.23	.587767	7.25
53	.426933	5.37	.561982	7.32	53	.445989	5.23	.588203	7.27
54	.427254	5.35	.562421	7.32	54	.446302	5.22	.588638	7.25
55	9.427576	5.37	9.562860	7.32	55	9.446616	5.23	9.589073	7.25
56	.427897	5.35	.563299	7.32	56	.446929	5.22	.589508	7.25
57	.428218	5.35	.563738	7.30	57	.447242	5.22	.589942	7.23
58	.428539	5.35	.564176	7.32	58	.447555	5.22	.590377	7.25
59	.428860	5.35	.564615	7.30	59	.447868	5.22	.590812	7.25
60	9.429181		9.565053		60	9.448181		9.591247	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

44°					45°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.448181		9.591247		0	9.466709		9.617224	
		5.20		7.23			5.08		7.20
1	.448493	5.22	.591681	7.25	1	.467014	5.08	.617656	7.18
2	.448806	5.20	.592116	7.25	2	.467319	5.08	.618087	7.18
3	.449118	5.22	.592551	7.23	3	.467624	5.07	.618518	7.18
4	.449431	5.20	.592985	7.23	4	.467928	5.08	.618949	7.18
5	9.449743	5.20	9.593419	7.25	5	9.468233	5.07	9.619380	7.18
6	.450055	5.18	.593854	7.23	6	.468537	5.07	.619811	7.18
7	.450366	5.20	.594288	7.23	7	.468841	5.07	.620242	7.18
8	.450678	5.20	.594722	7.23	8	.469145	5.07	.620673	7.18
9	.450990	5.18	.595156	7.25	9	.469449	5.07	.621104	7.18
10	9.451301		9.595591		10	9.469753		9.621535	
		5.18		7.23			5.07		7.18
11	.451612	5.20	.596025	7.23	11	.470057	5.05	.621966	7.17
12	.451924	5.18	.596459	7.23	12	.470360	5.07	.622396	7.18
13	.452235	5.18	.596893	7.22	13	.470664	5.05	.622827	7.18
14	.452546	5.17	.597326	7.23	14	.470967	5.05	.623258	7.17
15	9.452856	5.18	9.597760	7.23	15	9.471270	5.05	9.623688	7.18
16	.453167	5.18	.598194	7.23	16	.471573	5.05	.624119	7.17
17	.453478	5.17	.598628	7.22	17	.471876	5.05	.624549	7.18
18	.453788	5.17	.599061	7.23	18	.472179	5.05	.624980	7.17
19	.454098	5.17	.599495	7.22	19	.472482	5.03	.625410	7.18
20	9.454408		9.599928		20	9.472784		9.625841	
		5.17		7.23			5.05		7.17
21	.454718	5.17	.600362	7.22	21	.473087	5.03	.626271	7.17
22	.455028	5.17	.600795	7.23	22	.473389	5.03	.626701	7.17
23	.455338	5.17	.601229	7.22	23	.473691	5.03	.627131	7.17
24	.455648	5.15	.601662	7.22	24	.473993	5.03	.627561	7.17
25	9.455957	5.17	9.602095	7.22	25	9.474295	5.03	9.627991	7.17
26	.456267	5.15	.602528	7.23	26	.474597	5.03	.628421	7.17
27	.456576	5.15	.602962	7.22	27	.474899	5.02	.628851	7.17
28	.456885	5.15	.603395	7.22	28	.475200	5.03	.629281	7.17
29	.457194	5.15	.603828	7.22	29	.475502	5.02	.629711	7.17
30	9.457503		9.604261		30	9.475803		9.630141	
		5.13		7.22			5.02		7.17
31	.457811	5.15	.604694	7.20	31	.476104	5.02	.630571	7.17
32	.458120	5.15	.605126	7.22	32	.476405	5.02	.631001	7.15
33	.458429	5.13	.605559	7.22	33	.476706	5.02	.631430	7.17
34	.458737	5.13	.605992	7.22	34	.477007	5.02	.631860	7.17
35	9.459045	5.13	9.606425	7.20	35	9.477308	5.00	9.632290	7.15
36	.459353	5.13	.606857	7.22	36	.477608	5.02	.632719	7.17
37	.459661	5.13	.607290	7.20	37	.477909	5.00	.633149	7.15
38	.459969	5.13	.607722	7.22	38	.478209	5.00	.633578	7.17
39	.460277	5.12	.608155	7.20	39	.478509	5.00	.634008	7.15
40	9.460584		9.608587		40	9.478809		9.634437	
		5.13		7.22			5.00		7.15
41	.460892	5.12	.609020	7.20	41	.479109	5.00	.634866	7.17
42	.461199	5.12	.609452	7.20	42	.479409	5.00	.635296	7.15
43	.461506	5.12	.609884	7.20	43	.479709	5.00	.635725	7.15
44	.461813	5.12	.610316	7.22	44	.480009	4.98	.636154	7.15
45	9.462120	5.12	9.610749	7.20	45	9.480308	5.00	9.636583	7.15
46	.462427	5.12	.611181	7.20	46	.480608	4.98	.637012	7.15
47	.462734	5.10	.611613	7.20	47	.480907	4.98	.637441	7.15
48	.463040	5.12	.612045	7.20	48	.481206	4.98	.637870	7.15
49	.463347	5.10	.612477	7.18	49	.481505	4.98	.638299	7.15
50	9.463653		9.612908		50	9.481804		9.638728	
		5.10		7.20			4.98		7.15
51	.463959	5.10	.613340	7.20	51	.482103	4.97	.639157	7.15
52	.464265	5.10	.613772	7.20	52	.482401	4.98	.639586	7.15
53	.464571	5.10	.614204	7.18	53	.482700	4.97	.640015	7.13
54	.464877	5.10	.614635	7.20	54	.482998	4.97	.640443	7.15
55	9.465183	5.08	9.615067	7.20	55	9.483296	4.98	9.640872	7.15
56	.465488	5.10	.615499	7.18	56	.483595	4.97	.641301	7.13
57	.465794	5.08	.615930	7.20	57	.483893	4.97	.641729	7.15
58	.466099	5.08	.616362	7.18	58	.484191	4.95	.642158	7.13
59	.466404	5.08	.616793	7.18	59	.484488	4.97	.642586	7.15
60	9.466709		9.617224		60	9.484786		9.643015	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

46°					47°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 484786	4. 97	9. 643015	7. 13	0	9. 502429	4. 85	9. 668646	7. 10
1	. 485084	4. 95	. 643443	7. 15	1	. 502720	4. 83	. 669072	7. 10
2	. 485381	4. 95	. 643872	7. 13	2	. 503010	4. 83	. 669498	7. 10
3	. 485678	4. 97	. 644300	7. 13	3	. 503300	4. 85	. 669924	7. 10
4	. 485976	4. 95	. 644728	7. 13	4	. 503591	4. 83	. 670350	7. 10
5	9. 486273	4. 95	9. 645156	7. 15	5	9. 503881	4. 83	9. 670776	7. 08
6	. 486570	4. 93	. 645585	7. 13	6	. 504171	4. 82	. 671201	7. 10
7	. 486866	4. 95	. 646013	7. 13	7	. 504460	4. 83	. 671627	7. 10
8	. 487163	4. 95	. 646441	7. 13	8	. 504750	4. 83	. 672053	7. 10
9	. 487460	4. 93	. 646869	7. 13	9	. 505040	4. 82	. 672479	7. 08
10	9. 487756	4. 95	9. 647297	7. 13	10	9. 505329	4. 82	9. 672904	7. 10
11	. 488053	4. 93	. 647725	7. 13	11	. 505618	4. 83	. 673330	7. 10
12	. 488349	4. 93	. 648153	7. 13	12	. 505908	4. 82	. 673756	7. 08
13	. 488645	4. 93	. 648581	7. 13	13	. 506197	4. 82	. 674181	7. 10
14	. 488941	4. 93	. 649009	7. 12	14	. 506486	4. 82	. 674607	7. 08
15	9. 489237	4. 93	9. 649436	7. 13	15	9. 506775	4. 80	9. 675032	7. 10
16	. 489533	4. 92	. 649864	7. 13	16	. 507063	4. 82	. 675458	7. 08
17	. 489828	4. 93	. 650292	7. 13	17	. 507352	4. 80	. 675883	7. 10
18	. 490124	4. 92	. 650720	7. 12	18	. 507640	4. 82	. 676309	7. 08
19	. 490419	4. 92	. 651147	7. 13	19	. 507929	4. 80	. 676734	7. 08
20	9. 490714	4. 93	9. 651575	7. 12	20	9. 508217	4. 80	9. 677159	7. 08
21	. 491010	4. 92	. 652002	7. 13	21	. 508505	4. 80	. 677584	7. 10
22	. 491305	4. 92	. 652430	7. 12	22	. 508793	4. 80	. 678010	7. 08
23	. 491600	4. 92	. 652857	7. 13	23	. 509081	4. 80	. 678435	7. 08
24	. 491894	4. 90	. 653285	7. 12	24	. 509369	4. 80	. 678860	7. 08
25	9. 492189	4. 92	9. 653712	7. 13	25	9. 509657	4. 80	9. 679285	7. 08
26	. 492484	4. 90	. 654140	7. 12	26	. 509945	4. 78	. 679710	7. 10
27	. 492778	4. 90	. 654567	7. 12	27	. 510232	4. 80	. 680136	7. 08
28	. 493072	4. 92	. 654994	7. 12	28	. 510520	4. 78	. 680561	7. 08
29	. 493367	4. 90	. 655421	7. 13	29	. 510807	4. 78	. 680986	7. 08
30	9. 493661	4. 90	9. 655849	7. 12	30	9. 511094	4. 78	9. 681411	7. 08
31	. 493955	4. 90	. 656276	7. 12	31	. 511381	4. 78	. 681836	7. 07
32	. 494249	4. 88	. 656703	7. 12	32	. 511668	4. 78	. 682260	7. 08
33	. 494542	4. 90	. 657130	7. 12	33	. 511955	4. 77	. 682685	7. 08
34	. 494836	4. 90	. 657557	7. 12	34	. 512241	4. 78	. 683110	7. 08
35	9. 495130	4. 88	9. 657984	7. 12	35	9. 512528	4. 78	9. 683535	7. 08
36	. 495423	4. 88	. 658411	7. 12	36	. 512815	4. 77	. 683960	7. 08
37	. 495716	4. 88	. 658838	7. 12	37	. 513101	4. 77	. 684385	7. 07
38	. 496009	4. 88	. 658265	7. 10	38	. 513387	4. 77	. 684809	7. 08
39	. 496302	4. 88	. 659691	7. 12	39	. 513673	4. 77	. 685234	7. 08
40	9. 496595	4. 88	9. 660118	7. 12	40	9. 513959	4. 77	9. 685659	7. 07
41	. 496888	4. 88	. 660545	7. 12	41	. 514245	4. 77	. 686083	7. 08
42	. 497181	4. 87	. 660972	7. 10	42	. 514531	4. 77	. 686508	7. 08
43	. 497473	4. 88	. 661398	7. 12	43	. 514817	4. 75	. 686933	7. 07
44	. 497766	4. 87	. 661825	7. 12	44	. 515102	4. 77	. 687357	7. 08
45	9. 498058	4. 87	9. 662252	7. 10	45	9. 515388	4. 75	9. 687782	7. 07
46	. 498350	4. 88	. 662678	7. 12	46	. 515673	4. 77	. 688206	7. 08
47	. 498643	4. 87	. 663105	7. 10	47	. 515959	4. 75	. 688631	7. 07
48	. 498935	4. 85	. 663531	7. 12	48	. 516244	4. 75	. 689055	7. 07
49	. 499226	4. 87	. 663958	7. 10	49	. 516529	4. 75	. 689479	7. 08
50	9. 499518	4. 87	9. 664384	7. 10	50	9. 516814	4. 73	9. 689904	7. 07
51	. 499810	4. 85	. 664810	7. 12	51	. 517098	4. 75	. 690328	7. 07
52	. 500101	4. 87	. 665237	7. 10	52	. 517383	4. 75	. 690752	7. 08
53	. 500393	4. 85	. 665663	7. 10	53	. 517668	4. 73	. 691177	7. 07
54	. 500684	4. 85	. 666089	7. 10	54	. 517952	4. 73	. 691601	7. 07
55	9. 500975	4. 85	9. 666515	7. 12	55	9. 518236	4. 75	9. 692025	7. 07
56	. 501266	4. 85	. 666942	7. 10	56	. 518521	4. 73	. 692449	7. 07
57	. 501557	4. 85	. 667368	7. 10	57	. 518805	4. 73	. 692873	7. 08
58	. 501848	4. 85	. 667794	7. 10	58	. 519089	4. 73	. 693298	7. 07
59	. 502139	4. 83	. 668220	7. 10	59	. 519373	4. 73	. 693722	7. 07
60	9. 502429		9. 668646		60	9. 519657		9. 694146	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

48°					49°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 519657	4. 72	9. 694146	7. 07	0	9. 536484	4. 62	9. 719541	7. 05
1	. 519940	4. 73	. 694570	7. 07	1	. 536761	4. 62	. 719964	7. 03
2	. 520224	4. 72	. 694994	7. 07	2	. 537038	4. 62	. 720386	7. 05
3	. 520507	4. 73	. 695418	7. 07	3	. 537315	4. 62	. 720809	7. 03
4	. 520791	4. 72	. 695842	7. 07	4	. 537592	4. 62	. 721231	7. 03
5	9. 521074	4. 72	9. 696266	7. 05	5	9. 537869	4. 60	9. 721653	7. 05
6	. 521357	4. 72	. 696689	7. 07	6	. 538145	4. 62	. 722076	7. 03
7	. 521640	4. 72	. 697113	7. 07	7	. 538422	4. 60	. 722498	7. 05
8	. 521923	4. 72	. 697537	7. 07	8	. 538698	4. 60	. 722921	7. 03
9	. 522206	4. 70	. 697961	7. 07	9	. 538974	4. 62	. 723343	7. 03
10	9. 522488	4. 72	9. 698385	7. 07	10	9. 539251	4. 60	9. 723765	7. 05
11	. 522771	4. 72	. 698809	7. 05	11	. 539527	4. 60	. 724188	7. 03
12	. 523054	4. 70	. 699232	7. 07	12	. 539803	4. 60	. 724610	7. 03
13	. 523336	4. 70	. 699656	7. 07	13	. 540079	4. 58	. 725032	7. 03
14	. 523618	4. 70	. 700080	7. 05	14	. 540354	4. 60	. 725454	7. 05
15	9. 523900	4. 70	9. 700503	7. 07	15	9. 540630	4. 60	9. 725877	7. 03
16	. 524182	4. 70	. 700927	7. 05	16	. 540906	4. 58	. 726299	7. 03
17	. 524464	4. 70	. 701350	7. 07	17	. 541181	4. 58	. 726721	7. 03
18	. 524746	4. 70	. 701774	7. 07	18	. 541456	4. 60	. 727143	7. 03
19	. 525028	4. 68	. 702198	7. 05	19	. 541732	4. 58	. 727565	7. 05
20	9. 525309	4. 70	9. 702621	7. 07	20	9. 542007	4. 58	9. 727988	7. 03
21	. 525591	4. 68	. 703045	7. 05	21	. 542282	4. 58	. 728410	7. 03
22	. 525872	4. 68	. 703468	7. 05	22	. 542557	4. 58	. 728832	7. 03
23	. 526153	4. 70	. 703891	7. 07	23	. 542832	4. 57	. 729254	7. 03
24	. 526435	4. 68	. 704315	7. 05	24	. 543106	4. 58	. 729676	7. 03
25	9. 526716	4. 68	9. 704738	7. 07	25	9. 543381	4. 57	9. 730098	7. 03
26	. 526997	4. 67	. 705162	7. 05	26	. 543655	4. 58	. 730520	7. 03
27	. 527277	4. 68	. 705585	7. 05	27	. 543930	4. 57	. 730942	7. 03
28	. 527558	4. 68	. 706008	7. 05	28	. 544204	4. 57	. 731364	7. 03
29	. 527839	4. 67	. 706431	7. 07	29	. 544478	4. 57	. 731786	7. 03
30	9. 528119	4. 68	9. 706855	7. 05	30	9. 544752	4. 57	9. 732208	7. 03
31	. 528400	4. 67	. 707278	7. 05	31	. 545026	4. 57	. 732630	7. 03
32	. 528680	4. 67	. 707701	7. 05	32	. 545300	4. 57	. 733052	7. 03
33	. 528960	4. 67	. 708124	7. 05	33	. 545574	4. 57	. 733474	7. 03
34	. 529240	4. 67	. 708547	7. 07	34	. 545848	4. 55	. 733896	7. 02
35	9. 529520	4. 67	9. 708971	7. 05	35	9. 546121	4. 57	9. 734317	7. 03
36	. 529800	4. 67	. 709394	7. 05	36	. 546395	4. 55	. 734739	7. 03
37	. 530080	4. 65	. 709817	7. 05	37	. 546668	4. 55	. 735161	7. 03
38	. 530359	4. 67	. 710240	7. 05	38	. 546941	4. 55	. 735583	7. 03
39	. 530639	4. 65	. 710663	7. 05	39	. 547214	4. 55	. 736005	7. 03
40	9. 530918	4. 67	9. 711086	7. 05	40	9. 547487	4. 55	9. 736427	7. 02
41	. 531198	4. 65	. 711509	7. 05	41	. 547760	4. 55	. 736848	7. 03
42	. 531477	4. 65	. 711932	7. 05	42	. 548033	4. 55	. 737270	7. 03
43	. 531756	4. 65	. 712355	7. 05	43	. 548306	4. 55	. 737692	7. 03
44	. 532035	4. 65	. 712778	7. 03	44	. 548579	4. 53	. 738114	7. 02
45	9. 532314	4. 63	9. 713200	7. 05	45	9. 548851	4. 55	9. 738535	7. 03
46	. 532592	4. 65	. 713623	7. 05	46	. 549124	4. 53	. 738957	7. 03
47	. 532871	4. 65	. 714046	7. 05	47	. 549396	4. 53	. 739379	7. 02
48	. 533150	4. 63	. 714469	7. 05	48	. 549668	4. 53	. 739800	7. 03
49	. 533428	4. 63	. 714892	7. 05	49	. 549940	4. 53	. 740222	7. 03
50	9. 533706	4. 65	9. 715315	7. 03	50	9. 550212	4. 53	9. 740644	7. 02
51	. 533985	4. 63	. 715737	7. 05	51	. 550484	4. 53	. 741065	7. 03
52	. 534263	4. 63	. 716160	7. 05	52	. 550756	4. 53	. 741487	7. 02
53	. 534541	4. 63	. 716583	7. 03	53	. 551028	4. 52	. 741908	7. 03
54	. 534819	4. 63	. 717005	7. 05	54	. 551299	4. 53	. 742330	7. 02
55	9. 535097	4. 62	9. 717428	7. 05	55	9. 551571	4. 52	9. 742751	7. 03
56	. 535374	4. 63	. 717851	7. 03	56	. 551842	4. 52	. 743173	7. 03
57	. 535652	4. 62	. 718273	7. 05	57	. 552113	4. 52	. 743595	7. 02
58	. 535929	4. 63	. 718696	7. 03	58	. 552384	4. 53	. 744016	7. 03
59	. 536207	4. 62	. 719118	7. 05	59	. 552656	4. 52	. 744438	7. 02
60	9. 536484		9. 719541		60	9. 552927		9. 744859	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

50°					51°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 552927		9. 744859		0	9. 568999		9. 770127	
		4. 50		7. 02			4. 42		7. 02
1	. 553197	4. 52	. 745280	7. 03	1	. 569264	4. 40	. 770548	7. 02
2	. 553468	4. 52	. 745702	7. 02	2	. 569528	4. 42	. 770969	7. 00
3	. 553739	4. 50	. 746123	7. 03	3	. 569793	4. 40	. 771389	7. 02
4	. 554009	4. 52	. 746545	7. 02	4	. 570057	4. 42	. 771810	7. 02
5	9. 554280	4. 50	9. 746966	7. 03	5	9. 570322	4. 40	9. 772231	7. 02
6	. 554550	4. 50	. 747388	7. 02	6	. 570586	4. 40	. 772652	7. 02
7	. 554820	4. 52	. 747809	7. 02	7	. 570850	4. 40	. 773073	7. 02
8	. 555091	4. 50	. 748230	7. 03	8	. 571114	4. 40	. 773494	7. 00
9	. 555361	4. 50	. 748652	7. 02	9	. 571378	4. 40	. 773914	7. 02
10	9. 555631		9. 749073		10	9. 571642		9. 774335	
		4. 48		7. 02			4. 40		7. 02
11	. 555900	4. 50	. 749494	7. 03	11	. 571906	4. 40	. 774756	7. 02
12	. 556170	4. 50	. 749916	7. 02	12	. 572170	4. 40	. 775177	7. 02
13	. 556440	4. 48	. 750337	7. 02	13	. 572434	4. 38	. 775598	7. 00
14	. 556709	4. 50	. 750758	7. 03	14	. 572697	4. 38	. 776018	7. 02
15	9. 556979	4. 48	9. 751180	7. 02	15	9. 572960	4. 40	9. 776439	7. 02
16	. 557248	4. 48	. 751601	7. 02	16	. 573224	4. 38	. 776860	7. 02
17	. 557517	4. 48	. 752022	7. 02	17	. 573487	4. 38	. 777281	7. 02
18	. 557786	4. 48	. 752443	7. 03	18	. 573750	4. 38	. 777702	7. 00
19	. 558055	4. 48	. 752865	7. 02	19	. 574013	4. 38	. 778122	7. 02
20	9. 558324		9. 753286		20	9. 574276		9. 778543	
		4. 48		7. 02			4. 38		7. 02
21	. 558593	4. 48	. 753707	7. 02	21	. 574539	4. 38	. 778964	7. 02
22	. 558862	4. 48	. 754128	7. 02	22	. 574802	4. 37	. 779385	7. 00
23	. 559131	4. 47	. 754549	7. 03	23	. 575064	4. 38	. 779805	7. 02
24	. 559399	4. 47	. 754971	7. 02	24	. 575327	4. 37	. 780226	7. 02
25	9. 559667	4. 48	9. 755392	7. 02	25	9. 575589	4. 38	9. 780647	7. 02
26	. 559936	4. 47	. 755813	7. 02	26	. 575852	4. 37	. 781068	7. 00
27	. 560204	4. 47	. 756234	7. 02	27	. 576114	4. 37	. 781488	7. 02
28	. 560472	4. 47	. 756655	7. 02	28	. 576376	4. 37	. 781909	7. 02
29	. 560740	4. 47	. 757076	7. 03	29	. 576638	4. 37	. 782330	7. 02
30	9. 561008		9. 757498		30	9. 576900		9. 782751	
		4. 47		7. 02			4. 37		7. 00
31	. 561276	4. 47	. 757919	7. 02	31	. 577162	4. 37	. 783171	7. 02
32	. 561544	4. 45	. 758340	7. 02	32	. 577424	4. 35	. 783592	7. 02
33	. 561811	4. 47	. 758761	7. 02	33	. 577685	4. 37	. 784013	7. 00
34	. 562079	4. 45	. 759182	7. 02	34	. 577947	4. 35	. 784433	7. 02
35	9. 562346	4. 45	9. 759603	7. 02	35	9. 578208	4. 37	9. 784854	7. 02
36	. 562613	4. 47	. 760024	7. 02	36	. 578470	4. 35	. 785275	7. 02
37	. 562881	4. 45	. 760445	7. 02	37	. 578731	4. 35	. 785696	7. 00
38	. 563148	4. 45	. 760866	7. 02	38	. 578992	4. 35	. 786116	7. 02
39	. 563415	4. 45	. 761287	7. 02	39	. 579253	4. 35	. 786537	7. 02
40	9. 563682		9. 761708		40	9. 579514		9. 786958	
		4. 43		7. 02			4. 35		7. 00
41	. 563948	4. 45	. 762129	7. 02	41	. 579775	4. 35	. 787378	7. 02
42	. 564215	4. 45	. 762550	7. 02	42	. 580036	4. 35	. 787799	7. 02
43	. 564482	4. 43	. 762971	7. 02	43	. 580297	4. 33	. 788220	7. 02
44	. 564748	4. 45	. 763392	7. 02	44	. 580557	4. 35	. 788641	7. 00
45	9. 565015	4. 43	9. 763813	7. 02	45	9. 580818	4. 33	9. 789061	7. 02
46	. 565281	4. 43	. 764234	7. 02	46	. 581078	4. 35	. 789482	7. 02
47	. 565547	4. 43	. 764655	7. 02	47	. 581339	4. 33	. 789903	7. 00
48	. 565813	4. 43	. 765076	7. 02	48	. 581599	4. 33	. 790323	7. 02
49	. 566079	4. 43	. 765497	7. 02	49	. 581859	4. 33	. 790744	7. 02
50	9. 566345		9. 765918		50	9. 582119		9. 791165	
		4. 43		7. 02			4. 33		7. 02
51	. 566611	4. 43	. 766339	7. 02	51	. 582379	4. 33	. 791586	7. 00
52	. 566877	4. 42	. 766760	7. 02	52	. 582639	4. 32	. 792006	7. 02
53	. 567142	4. 43	. 767181	7. 02	53	. 582898	4. 33	. 792427	7. 02
54	. 567408	4. 42	. 767602	7. 00	54	. 583158	4. 33	. 792848	7. 00
55	9. 567673	4. 42	9. 768022	7. 02	55	9. 583418	4. 32	9. 793268	7. 02
56	. 567938	4 43	. 768443	7. 02	56	. 583677	4. 32	. 793689	7. 02
57	. 568204	4. 42	. 768864	7. 02	57	. 583936	4. 33	. 794110	7. 02
58	. 588469	4. 42	. 769285	7. 02	58	. 584196	4. 32	. 794531	7. 00
59	. 568734	4 42	. 769706	7. 02	59	. 584455	4. 32	. 794951	7. 02
60	9. 568999		9. 770127		60	9. 584714		9. 795372	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

52°					53°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 584714	4. 32	9. 795372	7. 02	0	9. 600085	4. 22	9. 820622	7. 02
1	. 584973	4. 32	. 795793	7. 00	1	. 600338	4. 22	. 821043	7. 02
2	. 585232	4. 32	. 796213	7. 02	2	. 600591	4. 23	. 821464	7. 02
3	. 585491	4. 30	. 796634	7. 02	3	. 600845	4. 22	. 821885	7. 02
4	. 585749	4. 32	. 797055	7. 02	4	. 601098	4. 22	. 822306	7. 02
5	9. 586008	4. 30	9. 797476	7. 00	5	9. 601351	4. 20	9. 822727	7. 02
6	. 586266	4. 32	. 797896	7. 02	6	. 601603	4. 22	. 823148	7. 02
7	. 586525	4. 30	. 798317	7. 02	7	. 601856	4. 22	. 823569	7. 02
8	. 586783	4. 30	. 798738	7. 00	8	. 602109	4. 22	. 823990	7. 02
9	. 587041	4. 30	. 799158	7. 02	9	. 602362	4. 20	. 824411	7. 03
10	9. 587299	4. 30	9. 799579	7. 02	10	9. 602614	4. 20	9. 824833	7. 02
11	. 587557	4. 30	. 800000	7. 02	11	. 602866	4. 22	. 825254	7. 02
12	. 587815	4. 30	. 800421	7. 00	12	. 603119	4. 20	. 825675	7. 02
13	. 588073	4. 30	. 800841	7. 02	13	. 603371	4. 20	. 826096	7. 02
14	. 588331	4. 28	. 801262	7. 02	14	. 603623	4. 20	. 826517	7. 02
15	9. 588588	4. 30	9. 801683	7. 02	15	9. 603875	4. 20	9. 826938	7. 03
16	. 588846	4. 28	. 802104	7. 00	16	. 604127	4. 20	. 827360	7. 02
17	. 589103	4. 30	. 802524	7. 02	17	. 604379	4. 20	. 827781	7. 02
18	. 589361	4. 28	. 802945	7. 02	18	. 604631	4. 20	. 828202	7. 02
19	. 589618	4. 28	. 803366	7. 02	19	. 604883	4. 18	. 828623	7. 02
20	9. 589875	4. 28	9. 803787	7. 00	20	9. 605134	4. 20	9. 829044	7. 03
21	. 590132	4. 28	. 804207	7. 02	21	. 605386	4. 18	. 829466	7. 02
22	. 590389	4. 28	. 804628	7. 02	22	. 605637	4. 18	. 829887	7. 02
23	. 590646	4. 28	. 805049	7. 02	23	. 605888	4. 20	. 830308	7. 02
24	. 590903	4. 28	. 805470	7. 02	24	. 606140	4. 18	. 830729	7. 03
25	9. 591160	4. 27	9. 805891	7. 00	25	9. 606391	4. 18	9. 831151	7. 02
26	. 591416	4. 28	. 806311	7. 02	26	. 606642	4. 18	. 831572	7. 02
27	. 591673	4. 27	. 806732	7. 02	27	. 606893	4. 18	. 831993	7. 03
28	. 591929	4. 27	. 807153	7. 02	28	. 607144	4. 17	. 832415	7. 02
29	. 592185	4. 28	. 807574	7. 02	29	. 607394	4. 18	. 832836	7. 02
30	9. 592442	4. 27	9. 807995	7. 00	30	9. 607645	4. 18	9. 833257	7. 03
31	. 592698	4. 27	. 808415	7. 02	31	. 607896	4. 17	. 833679	7. 02
32	. 592954	4. 27	. 808836	7. 02	32	. 608146	4. 18	. 834100	7. 03
33	. 593210	4. 27	. 809257	7. 02	33	. 608397	4. 17	. 834522	7. 02
34	. 593466	4. 25	. 809678	7. 02	34	. 608647	4. 17	. 834943	7. 02
35	9. 593721	4. 27	9. 810099	7. 02	35	9. 608897	4. 17	9. 835364	7. 03
36	. 593977	4. 27	. 810520	7. 00	36	. 609147	4. 17	. 835786	7. 02
37	. 594233	4. 25	. 810940	7. 02	37	. 609397	4. 17	. 836207	7. 03
38	. 594488	4. 25	. 811361	7. 02	38	. 609647	4. 17	. 836629	7. 02
39	. 594743	4. 27	. 811782	7. 02	39	. 609897	4. 17	. 837050	7. 03
40	9. 594999	4. 25	9. 812203	7. 02	40	9. 610147	4. 17	9. 837472	7. 02
41	. 595254	4. 25	. 812624	7. 02	41	. 610397	4. 15	. 837893	7. 03
42	. 595509	4. 25	. 813045	7. 02	42	. 610646	4. 17	. 838315	7. 02
43	. 595764	4. 25	. 813466	7. 00	43	. 610896	4. 15	. 838736	7. 03
44	. 596019	4. 25	. 813886	7. 02	44	. 611145	4. 15	. 839158	7. 02
45	9. 596274	4. 23	9. 814307	7. 02	45	9. 611394	4. 17	9. 839579	7. 03
46	. 596528	4. 25	. 814728	7. 02	46	. 611644	4. 15	. 840001	7. 03
47	. 596783	4. 25	. 815149	7. 02	47	. 611893	4. 15	. 840423	7. 02
48	. 597038	4. 23	. 815570	7. 02	48	. 612142	4. 15	. 840844	7. 03
49	. 597292	4. 23	. 815991	7. 02	49	. 612391	4. 15	. 841266	7. 02
50	9. 597546	4. 25	9. 816412	7. 02	50	9. 612640	4. 13	9. 841687	7. 03
51	. 597801	4. 23	. 816833	7. 02	51	. 612888	4. 15	. 842109	7. 03
52	. 598055	4. 23	. 817254	7. 02	52	. 613137	4. 15	. 842531	7. 03
53	. 598309	4. 23	. 817675	7. 02	53	. 613386	4. 13	. 842953	7. 02
54	. 598563	4. 23	. 818096	7. 02	54	. 613634	4. 15	. 843374	7. 03
55	9. 598817	4. 23	9. 818517	7. 02	55	9. 613883	4. 13	9. 843796	7. 03
56	. 599071	4. 22	. 818938	7. 02	56	. 614131	4. 13	. 844218	7. 02
57	. 599324	4. 23	819359	7. 02	57	. 614379	4. 13	. 844639	7. 03
58	. 599578	4. 22	. 819780	7. 02	58	. 614627	4. 15	. 845061	7. 03
59	. 599831	4. 23	. 820201	7. 02	59	. 614876	4. 13	. 845483	7. 03
60	9. 600085		9. 820622		60	9. 615124		9. 845905	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

54°					55°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.615124		9.845905		0	9.629841		9.871250	
1	.615371	4.12	.846327	7.03	1	.630084	4.05	.871673	7.05
2	.615619	4.13	.846749	7.03	2	.630326	4.03	.872096	7.05
3	.615867	4.13	.847170	7.02	3	.630569	4.05	.872519	7.05
4	.616115	4.13	.847592	7.03	4	.630811	4.03	.872942	7.05
5	9.616362	4.12	9.848014	7.03	5	9.631054	4.05	9.873366	7.07
6	.616610	4.13	.848436	7.03	6	.631296	4.03	.873789	7.05
7	.616857	4.12	.848858	7.03	7	.631538	4.03	.874212	7.05
8	.617104	4.12	.849280	7.03	8	.631780	4.03	.874636	7.07
9	.617351	4.12	.849702	7.03	9	.632022	4.03	.875059	7.05
10	9.617598	4.12	9.850124	7.03	10	9.632264	4.02	9.875482	7.07
11	.617845	4.12	.850546	7.03	11	.632505	4.03	.875906	7.05
12	.618092	4.12	.850968	7.03	12	.632747	4.03	.876329	7.05
13	.618339	4.12	.851390	7.03	13	.632989	4.02	.876752	7.07
14	.618586	4.12	.851812	7.03	14	.633230	4.03	.877176	7.05
15	9.618833	4.10	9.852234	7.03	15	9.633472	4.02	9.877599	7.07
16	.619079	4.12	.852656	7.03	16	.633713	4.02	.878023	7.05
17	.619326	4.10	.853078	7.03	17	.633954	4.03	.878446	7.07
18	.619572	4.10	.853500	7.05	18	.634196	4.02	.878870	7.07
19	.619818	4.12	.853923	7.03	19	.634437	4.02	.879294	7.05
20	9.620065	4.10	9.854345	7.03	20	9.634678	4.02	9.879717	7.07
21	.620311	4.10	.854767	7.03	21	.634919	4.00	.880141	7.07
22	.620557	4.10	.855189	7.05	22	.635159	4.02	.880565	7.05
23	.620803	4.08	.855612	7.03	23	.635400	4.02	.880988	7.07
24	.621048	4.10	.856034	7.03	24	.635641	4.00	.881412	7.07
25	9.621294	4.10	9.856456	7.03	25	9.635881	4.02	9.881836	7.07
26	.621540	4.10	.856878	7.05	26	.636122	4.00	.882260	7.05
27	.621786	4.08	.857301	7.03	27	.636362	4.02	.882683	7.07
28	.622031	4.08	.857723	7.03	28	.636603	4.00	.883107	7.07
29	.622276	4.10	.858145	7.05	29	.636843	4.00	.883531	7.07
30	9.622522	4.08	9.858568	7.03	30	9.637083	4.00	9.883955	7.07
31	.622767	4.08	.858990	7.05	31	.637323	4.00	.884379	7.07
32	.623012	4.08	.859413	7.03	32	.637563	4.00	.884803	7.07
33	.623257	4.08	.859835	7.05	33	.637803	4.00	.885227	7.07
34	.623502	4.08	.860258	7.03	34	.638043	4.00	.885651	7.07
35	9.623747	4.08	9.860680	7.05	35	9.638283	3.98	9.886075	7.07
36	.623992	4.08	.861103	7.03	36	.638522	4.00	.886499	7.07
37	.624237	4.07	.861525	7.05	37	.638762	3.98	.886923	7.07
38	.624481	4.08	.861948	7.03	38	.639001	4.00	.887347	7.08
39	.624726	4.07	.862370	7.05	39	.639241	3.98	.887772	7.07
40	9.624970	4.08	9.862793	7.03	40	9.639480	3.98	9.888196	7.07
41	.625215	4.07	.863215	7.05	41	.639719	3.98	.888620	7.07
42	.625459	4.07	.863638	7.05	42	.639958	3.98	.889044	7.08
43	.625703	4.07	.864061	7.03	43	.640197	3.98	.889469	7.07
44	.625947	4.07	.864483	7.05	44	.640436	3.98	.889893	7.07
45	9.626191	4.07	9.864906	7.05	45	9.640675	3.98	9.890317	7.08
46	.626435	4.07	.865329	7.05	46	.640914	3.98	.890742	7.07
47	.626679	4.07	.865752	7.03	47	.641153	3.97	.891166	7.08
48	.626923	4.05	.866174	7.05	48	.641391	3.98	.891591	7.07
49	.627166	4.07	.866597	7.05	49	.641630	3.97	.892015	7.08
50	9.627410	4.07	9.867020	7.05	50	9.641868	3.98	9.892440	7.07
51	.627654	4.05	.867443	7.05	51	.642107	3.97	.892864	7.08
52	.627897	4.05	.867866	7.05	52	.642345	3.97	.893289	7.08
53	.628140	4.07	.868289	7.05	53	.642583	3.98	.893714	7.07
54	.628384	4.05	.868712	7.05	54	.642822	3.97	.894138	7.08
55	9.628627	4.05	9.869135	7.05	55	9.643060	3.97	9.894563	7.08
56	.628870	4.05	.869558	7.05	56	.643298	3.95	.894988	7.07
57	.629113	4.05	.869981	7.05	57	.643535	3.97	.895412	7.08
58	.629356	4.03	.870404	7.05	58	.643773	3.97	.895837	7.08
59	.629598	4.05	.870827	7.05	59	.644011	3.97	.896262	7.08
60	9.629841		9.871250		60	9.644249		9.896687	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

56°					57°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 644249	3. 95	9. 896687	7. 08	0	9. 658356	3. 87	9. 922247	7. 12
1	. 644486	3. 97	. 897112	7. 08	1	. 658588	3. 88	. 922674	7. 13
2	. 644724	3. 95	. 897537	7. 08	2	. 658821	3. 87	. 923102	7. 12
3	. 644961	3. 95	. 897962	7. 08	3	. 659053	3. 88	. 923529	7. 12
4	. 645198	3. 97	. 898387	7. 08	4	. 659286	3. 87	. 923956	7. 13
5	9. 645436	3. 95	9. 898812	7. 08	5	9. 659518	3. 87	9. 924384	7. 12
6	. 645673	3. 95	. 899237	7. 08	6	. 659750	3. 88	. 924811	7. 13
7	. 645910	3. 95	. 899662	7. 08	7	. 659983	3. 87	. 925239	7. 12
8	. 646147	3. 95	. 900087	7. 08	8	. 660215	3. 87	. 925666	7. 13
9	. 646384	3. 93	. 900512	7. 10	9	. 660447	3. 87	. 926094	7. 12
10	9. 646620	3. 95	9. 900938	7. 08	10	9. 660679	3. 85	9. 926521	7. 13
11	. 646857	3. 95	. 901363	7. 08	11	. 660910	3. 87	. 926949	7. 13
12	. 647094	3. 93	. 901788	7. 08	12	. 661142	3. 87	. 927377	7. 12
13	. 647330	3. 95	. 902213	7. 10	13	. 661374	3. 85	. 927804	7. 13
14	. 647567	3. 93	. 902639	7. 08	14	. 661605	3. 87	. 928232	7. 13
15	9. 647803	3. 93	9. 903064	7. 10	15	9. 661837	3. 85	9. 928660	7. 13
16	. 648039	3. 95	. 903490	7. 08	16	. 662068	3. 87	. 929088	7. 13
17	. 648276	3. 93	. 903915	7. 10	17	. 662300	3. 85	. 929516	7. 13
18	. 648512	3. 93	. 904341	7. 08	18	. 662531	3. 85	. 929944	7. 13
19	. 648748	3. 93	. 904766	7. 10	19	. 662762	3. 85	. 930372	7. 13
20	9. 648984	3. 93	9. 905192	7. 08	20	9. 662993	3. 85	9. 930800	7. 13
21	. 649220	3. 93	. 905617	7. 10	21	. 663224	3. 85	. 931228	7. 13
22	. 649456	3. 92	. 906043	7. 10	22	. 663455	3. 85	. 931656	7. 15
23	. 649691	3. 93	. 906469	7. 08	23	. 663686	3. 85	. 932085	7. 13
24	. 649927	3. 93	. 906894	7. 10	24	. 663917	3. 85	. 932513	7. 13
25	9. 650163	3. 92	9. 907320	7. 10	25	9. 664148	3. 83	9. 932941	7. 13
26	. 650398	3. 92	. 907746	7. 10	26	. 664378	3. 85	. 933369	7. 15
27	. 650633	3. 93	. 908172	7. 10	27	. 664609	3. 83	. 933798	7. 13
28	. 650869	3. 92	. 908598	7. 10	28	. 664839	3. 85	. 934226	7. 15
29	. 651104	3. 92	. 909024	7. 10	29	. 665070	3. 83	. 934655	7. 13
30	9. 651339	3. 92	9. 909450	7. 10	30	9. 665300	3. 83	9. 935083	7. 15
31	. 651574	3. 92	. 909876	7. 10	31	. 665530	3. 83	. 935512	7. 15
32	. 651809	3. 92	. 910302	7. 10	32	. 665760	3. 83	. 935941	7. 13
33	. 652044	3. 92	. 910728	7. 10	33	. 665990	3. 83	. 936369	7. 15
34	. 652279	3. 92	. 911154	7. 10	34	. 666220	3. 83	. 936798	7. 15
35	9. 652514	3. 90	9. 911580	7. 10	35	9. 666450	3. 83	9. 937227	7. 15
36	. 652748	3. 92	. 912006	7. 10	36	. 666680	3. 83	. 937656	7. 15
37	. 652983	3. 90	. 912432	7. 12	37	. 666910	3. 82	. 938085	7. 13
38	. 653217	3. 92	. 912859	7. 10	38	. 667139	3. 83	. 938513	7. 15
39	. 653452	3. 90	. 913285	7. 10	39	. 667369	3. 83	. 938942	7. 15
40	9. 653686	3. 90	9. 913711	7. 12	40	9. 667599	3. 82	9. 939371	7. 17
41	. 653920	3. 92	. 914138	7. 10	41	. 667828	3. 82	. 939801	7. 15
42	. 654155	3. 90	. 914564	7. 12	42	. 668057	3. 83	. 940230	7. 15
43	. 654389	3. 90	. 914991	7. 10	43	. 668287	3. 82	. 940659	7. 15
44	. 654623	3. 90	. 915417	7. 12	44	. 668516	3. 82	. 941088	7. 15
45	9. 654857	3. 88	9. 915844	7. 10	45	9. 668745	3. 82	9. 941517	7. 17
46	. 655090	3. 90	. 916270	7. 12	46	. 668974	3. 82	. 941947	7. 15
47	. 655324	3. 90	. 916697	7. 12	47	. 669203	3. 82	. 942376	7. 17
48	. 655558	3. 90	. 917124	7. 10	48	. 669432	3. 82	. 942806	7. 15
49	. 655792	3. 88	. 917550	7. 12	49	. 669661	3. 80	. 943235	7. 17
50	9. 656025	3. 88	9. 917977	7. 12	50	9. 669889	3. 82	9. 943665	7. 15
51	. 656258	3. 90	. 918404	7. 12	51	. 670118	3. 82	. 944094	7. 17
52	. 656492	3. 88	. 918831	7. 12	52	. 670347	3. 80	. 944524	7. 15
53	. 656725	3. 88	. 919258	7. 12	53	. 670575	3. 82	. 944953	7. 17
54	. 656958	3. 88	. 919685	7. 12	54	. 670804	3. 80	. 945383	7. 17
55	9. 657191	3. 88	9. 920112	7. 12	55	9. 671032	3. 80	9. 945813	7. 17
56	. 657424	3. 88	. 920539	7. 12	56	. 671260	3. 80	. 946243	7. 17
57	. 657657	3. 88	. 920966	7. 12	57	. 671488	3. 80	. 946673	7. 17
58	. 657890	3. 88	. 921393	7. 12	58	. 671716	3. 82	. 947103	7. 17
59	. 658123	3. 88	. 921820	7. 12	59	. 671945	3. 78	. 947533	7. 17
60	9. 658356		9. 922247		60	9. 672172		9. 947963	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

58°					59°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.672172		9.947963		0	9.685708		9.973868	
		3.80		7.17			3.72		7.23
1	.672400	3.80	.948393	7.17	1	.685931	3.72	.974302	7.23
2	.672628	3.80	.948823	7.17	2	.686154	3.72	.974736	7.22
3	.672856	3.78	.949253	7.17	3	.686377	3.72	.975169	7.23
4	.673083	3.80	.949683	7.18	4	.686600	3.72	.975603	7.23
5	9.673311	3.78	9.950114	7.17	5	9.686823	3.72	9.976037	7.23
6	.673538	3.80	.950544	7.18	6	.687046	3.72	.976471	7.23
7	.673766	3.78	.950975	7.17	7	.687269	3.72	.976905	7.23
8	.673993	3.78	.951405	7.18	8	.687492	3.70	.977339	7.23
9	.674220	3.80	.951836	7.17	9	.687714	3.72	.977773	7.23
10	9.674448		9.952266		10	9.687937		9.978207	
		3.78		7.18			3.70		7.23
11	.674675	3.78	.952697	7.18	11	.688159	3.72	.978641	7.23
12	.674902	3.78	.953128	7.17	12	.688382	3.70	.979075	7.25
13	.675129	3.78	.953558	7.18	13	.688604	3.70	.979510	7.23
14	.675356	3.77	.953989	7.18	14	.688826	3.70	.979944	7.25
15	9.675582	3.78	9.954420	7.18	15	9.689048	3.72	9.980379	7.23
16	.675809	3.78	.954851	7.18	16	.689271	3.70	.980813	7.25
17	.676036	3.77	.955282	7.18	17	.689493	3.70	.981248	7.23
18	.676262	3.78	.955713	7.18	18	.689715	3.70	.981682	7.25
19	.676489	3.77	.956144	7.18	19	.689937	3.68	.982117	7.25
20	9.676715		9.956575		20	9.690158		9.982552	
		3.77		7.18			3.70		7.25
21	.676941	3.78	.957006	7.20	21	.690380	3.70	.982987	7.25
22	.677168	3.77	.957438	7.18	22	.690602	3.68	.983422	7.25
23	.677394	3.77	.957869	7.18	23	.690823	3.70	.983857	7.25
24	.677620	3.77	.958300	7.20	24	.691045	3.68	.984292	7.25
25	9.677846	3.77	9.958732	7.18	25	9.691266	3.70	9.984727	7.25
26	.678072	3.77	.959163	7.20	26	.691488	3.68	.985162	7.25
27	.678298	3.75	.959595	7.18	27	.691709	3.68	.985597	7.27
28	.678523	3.77	.960026	7.20	28	.691930	3.68	.986033	7.25
29	.678749	3.77	.960458	7.20	29	.692151	3.68	.986468	7.27
30	9.678975		9.960890		30	9.692372		9.986904	
		3.75		7.18			3.68		7.25
31	.679200	3.77	.961321	7.20	31	.692593	3.68	.987339	7.27
32	.679426	3.75	.961753	7.20	32	.692814	3.68	.987775	7.25
33	.679651	3.75	.962185	7.20	33	.693035	3.68	.988210	7.27
34	.679876	3.77	.962617	7.20	34	.693256	3.68	.988646	7.27
35	9.680102	3.75	9.963049	7.20	35	9.693477	3.67	9.989082	7.27
36	.680327	3.75	.963481	7.20	36	.693697	3.68	.989518	7.27
37	.680552	3.75	.963913	7.20	37	.693918	3.67	.989954	7.27
38	.680777	3.75	.964345	7.22	38	.694138	3.68	.990390	7.27
39	.681002	3.75	.964778	7.20	39	.694359	3.67	.990826	7.27
40	9.681227		9.965210		40	9.694579		9.991262	
		3.73		7.20			3.67		7.27
41	.681451	3.75	.965642	7.22	41	.694799	3.67	.991698	7.27
42	.681676	3.75	.966075	7.20	42	.695019	3.68	.992134	7.28
43	.681901	3.73	.966507	7.22	43	.695240	3.67	.992571	7.27
44	.682125	3.75	.966940	7.20	44	.695460	3.67	.993007	7.28
45	9.682350	3.73	9.967372	7.22	45	9.695680	3.65	9.993444	7.27
46	.682574	3.73	.967805	7.22	46	.695899	3.67	.993880	7.28
47	.682798	3.75	.968238	7.20	47	.696119	3.67	.994317	7.28
48	.683023	3.73	.968670	7.22	48	.696339	3.67	.994754	7.28
49	.683247	3.73	.969103	7.22	49	.696559	3.65	.995191	7.27
50	9.683471		9.969536		50	9.696778		9.995627	
		3.73		7.22			3.67		7.28
51	.683695	3.73	.969969	7.22	51	.696998	3.65	.996064	7.28
52	.683919	3.73	.970402	7.22	52	.697217	3.67	.996501	7.28
53	.684143	3.73	.970835	7.22	53	.697437	3.65	.996938	7.30
54	.684367	3.72	.971268	7.22	54	.697656	3.65	.997376	7.28
55	9.684590	3.73	9.971701	7.23	55	9.697875	3.65	9.997813	7.28
56	.684814	3.72	.972135	7.22	56	.698094	3.65	.998250	7.28
57	.685037	3.73	.972568	7.22	57	.698313	3.65	.998687	7.30
58	.685261	3.72	.973001	7.23	58	.698532	3.65	.999125	7.28
59	.685484	3.73	.973435	7.22	59	.698751	3.65	.999562	7.30
60	9.685708		9.973868		60	9.698970		0.000000	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

60°					61°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.698970	3.65	0.000000	7.30	0	9.711968	3.57	0.026397	7.37
1	.699189	3.63	.000438	7.28	1	.712182	3.58	.026839	7.37
2	.699407	3.65	.000875	7.30	2	.712397	3.57	.027281	7.38
3	.699626	3.65	.001313	7.30	3	.712611	3.57	.027724	7.38
4	.699845	3.63	.001751	7.30	4	.712825	3.57	.028167	7.38
5	9.700063	3.65	0.002189	7.30	5	9.713039	3.57	0.028609	7.37
6	.700282	3.63	.002627	7.30	6	.713253	3.57	.029052	7.38
7	.700500	3.63	.003065	7.30	7	.713467	3.57	.029495	7.38
8	.700718	3.63	.003503	7.32	8	.713681	3.57	.029938	7.38
9	.700936	3.63	.003942	7.30	9	.713895	3.57	.030381	7.40
10	9.701154	3.63	0.004380	7.30	10	9.714109	3.57	0.030825	7.38
11	.701372	3.63	.004818	7.32	11	.714323	3.55	.031268	7.38
12	.701590	3.63	.005257	7.30	12	.714536	3.57	.031711	7.40
13	.701808	3.63	.005695	7.32	13	.714750	3.55	.032155	7.38
14	.702026	3.63	.006134	7.32	14	.714963	3.57	.032598	7.40
15	9.702244	3.63	0.006573	7.32	15	9.715177	3.55	0.033042	7.40
16	.702462	3.62	.007012	7.30	16	.715390	3.55	.033486	7.38
17	.702679	3.63	.007450	7.32	17	.715603	3.57	.033929	7.40
18	.702897	3.62	.007889	7.32	18	.715817	3.55	.034373	7.40
19	.703114	3.63	.008328	7.32	19	.716030	3.55	.034817	7.40
20	9.703332	3.62	0.008767	7.33	20	9 716243	3.55	0.035261	7.40
21	.703549	3.62	.009207	7.32	21	.716456	3.55	.035705	7.42
22	.703766	3.62	.009646	7.32	22	.716669	3.55	.036150	7.40
23	.703983	3.62	.010085	7.33	23	.716882	3.55	.036594	7.40
24	.704200	3.62	.010525	7.32	24	.717095	3.53	.037038	7.42
25	9.704417	3.62	0.010964	7.33	25	9.717307	3.55	0.037483	7.42
26	.704634	3.62	.011404	7.32	26	.717520	3.53	.037928	7.40
27	.704851	3.62	.011843	7.33	27	.717732	3.55	.038372	7.42
28	.705068	3.62	.012283	7.33	28	.717945	3.53	.038817	7.42
29	.705285	3.60	.012723	7.33	29	.718157	3.55	.039262	7.42
30	9.705501	3.62	0.013163	7.33	30	9.718370	3.53	0.039707	7.42
31	.705718	3.62	.013603	7.33	31	.718582	3.53	.040152	7.42
32	.705935	3.60	.014043	7.33	32	.718794	3.55	.040597	7.42
33	.706151	3.60	.014483	7.33	33	.719007	3.53	.041042	7.43
34	.706367	3.62	.014923	7.33	34	.719219	3.53	.041488	7.42
35	9.706584	3.60	0.015363	7.35	35	9.719431	3.53	0.041933	7.43
36	.706800	3.60	.015804	7.33	36	.719643	3.53	.042379	7.42
37	.707016	3.60	.016244	7.33	37	.719855	3.52	.042824	7.43
38	.707232	3.60	.016684	7.35	38	.720066	3.53	.043270	7.43
39	.707448	3.60	.017125	7.35	39	.720278	3.53	.043716	7.43
40	9.707664	3.60	0.017566	7.35	40	9.720490	3.52	0.044162	7.43
41	.707880	3.60	.018007	7.33	41	.720701	3.53	.044608	7.43
42	.708096	3.58	.018447	7.35	42	.720913	3.52	.045054	7.43
43	.708311	3.60	.018888	7.35	43	.721124	3.53	.045500	7.43
44	.708527	3.60	.019329	7.35	44	.721336	3.52	.045946	7.45
45	9.708743	3.58	0.019770	7.37	45	9.721547	3.52	0.046393	7.43
46	.708958	3.60	.020212	7.35	46	.721758	3.53	.046839	7.45
47	.709174	3.58	.020653	7.35	47	.721970	3.52	.047286	7.43
48	.709389	3.58	.021094	7.35	48	.722181	3.52	.047732	7.45
49	.709604	3.58	.021535	7.37	49	.722392	3.52	.048179	7.45
50	9.709819	3.60	0.021977	7.37	50	9.722603	3.52	0.048626	7.45
51	.710035	3.58	.022419	7.35	51	.722814	3.50	.049073	7.45
52	.710250	3.58	.022860	7.37	52	.723024	3.52	.049520	7.45
53	.710465	3.58	.023302	7.37	53	.723235	3.52	.049967	7.45
54	.710680	3.58	.023744	7.37	54	.723446	3.52	.050414	7.45
55	9.710895	3.57	0.024186	7.37	55	9.723657	3.50	0.050861	7.47
56	.711109	3.58	.024628	7.37	56	.723867	3.52	.051309	7.45
57	.711324	3.58	.025070	7.37	57	.724078	3.50	.051756	7.47
58	.711539	3.57	.025512	7.37	58	.724288	3.50	.052204	7.47
59	.711753	3.58	.025954	7.38	59	.724498	3.52	.052652	7.45
60	9.711968		0.026397		60	9.724709		0.053099	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

62°					63°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.724709		0.053099		0	9.737200		0.080153	
		3.50		7.47			3.43		7.58
1	.724919	3.50	.053547	7.47	1	.737406	3.43	.080608	7.57
2	.725129	3.50	.053995	7.47	2	.737612	3.43	.081062	7.57
3	.725339	3.50	.054443	7.48	3	.737818	3.43	.081516	7.58
4	.725549	3.50	.054892	7.47	4	.738024	3.43	.081971	7.57
5	9.725759		0.055340		5	9.738230		0.082425	
		3.50		7.47			3.43		7.58
6	.725969	3.50	.055788	7.48	6	.738436	3.43	.082880	7.58
7	.726179	3.48	.056237	7.47	7	.738642	3.42	.083335	7.58
8	.726388	3.50	.056685	7.48	8	.738847	3.43	.083790	7.58
9	.726598	3.50	.057134	7.48	9	.739053	3.42	.084245	7.58
10	9.726808		0.057583		10	9.739258		0.084700	
		3.48		7.48			3.43		7.58
11	.727017	3.50	.058032	7.48	11	.739464	3.42	.085155	7.60
12	.727227	3.48	.058481	7.48	12	.739669	3.43	.085611	7.58
13	.727436	3.48	.058930	7.48	13	.739875	3.42	.086066	7.60
14	.727645	3.50	.059379	7.48	14	.740080	3.42	.086522	7.58
15	9.727855		0.059828		15	9.740285		0.086977	
		3.48		7.50			3.42		7.60
16	.728064	3.48	.060278	7.48	16	.740490	3.42	.087433	7.60
17	.728273	3.48	.060727	7.50	17	.740695	3.42	.087889	7.60
18	.728482	3.48	.061177	7.48	18	.740900	3.42	.088345	7.60
19	.728691	3.48	.061626	7.50	19	.741105	3.42	.088801	7.62
20	9.728900		0.062076		20	9.741310		0.089258	
		3.48		7.50			3.42		7.60
21	.729109	3.47	.062526	7.50	21	.741515	3.40	.089714	7.62
22	.729317	3.48	.062976	7.50	22	.741719	3.42	.090171	7.60
23	.729526	3.48	.063426	7.50	23	.741924	3.42	.090627	7.62
24	.729736	3.47	.063876	7.52	24	.742129	3.40	.091084	7.62
25	9.729943		0.064327		25	9.742333		0.091541	
		3.48		7.50			3.42		7.62
26	.730152	3.47	.064777	7.50	26	.742538	3.40	.091998	7.62
27	.730360	3.48	.065227	7.52	27	.742742	3.40	.092455	7.62
28	.730569	3.47	.065678	7.52	28	.742946	3.40	.092912	7.63
29	.730777	3.47	.066129	7.52	29	.743150	3.42	.093370	7.62
30	9.730985		0.066580		30	9.743355		0.093827	
		3.47		7.50			3.40		7.63
31	.731193	3.47	.067030	7.53	31	.743559	3.40	.094285	7.63
32	.731401	3.47	.067482	7.52	32	.743763	3.40	.094743	7.62
33	.731609	3.47	.067933	7.52	33	.743967	3.40	.095200	7.63
34	.731817	3.47	.068384	7.52	34	.744171	3.40	.095658	7.63
35	9.732025		0.068835		35	9.744375		0.096116	
		3.47		7.53			3.38		7.65
36	.732233	3.47	.069287	7.52	36	.744578	3.40	.096575	7.63
37	.732441	3.45	.069738	7.53	37	.744782	3.40	.097033	7.63
38	.732648	3.47	.070190	7.53	38	.744986	3.38	.097491	7.65
39	.732856	3.47	.070642	7.52	39	.745189	3.40	.097950	7.63
40	9.733064		0.071093		40	9.745393		0.098408	
		3.45		7.53			3.38		7.65
41	.733271	3.45	.071545	7.55	41	.745596	3.40	.098867	7.65
42	.733478	3.47	.071998	7.53	42	.745800	3.38	.099326	7.65
43	.733686	3.45	.072450	7.53	43	.746003	3.38	.099785	7.65
44	.733893	3.45	.072902	7.53	44	.746206	3.38	.100244	7.67
45	9.734100		0.073354		45	9.746409		0.100704	
		3.45		7.55			3.40		7.65
46	.734307	3.47	.073807	7.55	46	.746613	3.38	.101163	7.67
47	.734515	3.43	.074260	7.53	47	.746816	3.38	.101623	7.65
48	.734721	3.45	.074712	7.55	48	.747019	3.38	.102082	7.67
49	.734928	3.45	.075165	7.55	49	.747222	3.37	.102542	7.67
50	9.735135		0.075618		50	9.747424		0.103002	
		3.45		7.55			3.38		7.67
51	.735342	3.45	.076071	7.55	51	.747627	3.38	.103462	7.67
52	.735549	3.43	.076524	7.55	52	.747830	3.38	.103922	7.67
53	.735755	3.45	.076977	7.57	53	.748033	3.37	.104382	7.68
54	.735962	3.45	.077431	7.55	54	.748235	3.38	.104843	7.67
55	9.736169		0.077884		55	9.748438		0.105303	
		3.43		7.57			3.37		7.68
56	.736375	3.43	.078338	7.57	56	.748640	3.38	.105764	7.67
57	.736581	3.45	.078792	7.55	57	.748843	3.37	.106224	7.68
58	.736788	3.43	.079245	7.57	58	.749045	3.37	.106685	7.68
59	.736994	3.43	.079699	7.57	59	.749247	3.37	.107146	7.68
60	9.737200		0.080153		60	9.749449		0.107607	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

64°					65°				
M.	Vers.	D. 1″.	Exsec.	D. 1″	M.	Vers.	D. 1″	Exsec.	D. 1″.
0	9. 749449	3. 38	0. 107607	7. 70	0	9. 761463	3. 30	0. 135515	7. 82
1	. 749652	3. 37	. 108069	7. 68	1	. 761661	3. 32	. 135984	7. 83
2	. 749854	3. 37	. 108530	7. 70	2	. 761860	3. 30	. 136454	7. 82
3	. 750056	3. 37	. 108992	7. 68	3	. 762058	3. 30	. 136923	7. 83
4	. 750258	3. 35	. 109453	7. 70	4	. 762256	3. 30	. 137393	7. 83
5	9. 750459	3. 37	0. 109915	7. 70	5	9. 762454	3. 30	0. 137863	7. 83
6	. 750661	3. 37	. 110377	7. 70	6	. 762652	3. 30	. 138333	7. 83
7	. 750863	3. 37	. 110839	7. 70	7	. 762850	3. 28	. 138803	7. 83
8	. 751065	3. 35	. 111301	7. 70	8	. 763047	3. 30	. 139273	7. 85
9	. 751266	3. 37	. 111763	7. 72	9	. 763245	3. 30	. 139744	7. 83
10	9. 751468	3. 35	0. 112226	7. 70	10	9. 763443	3. 30	0. 140214	7. 85
11	. 751669	3. 37	. 112688	7. 72	11	. 763641	3. 28	. 140685	7. 85
12	. 751871	3. 35	. 113151	7. 72	12	. 763838	3. 30	. 141156	7. 85
13	. 752072	3. 35	. 113614	7. 72	13	. 764036	3. 28	. 141627	7. 85
14	. 752273	3. 37	. 114077	7. 72	14	. 764233	3. 28	. 142008	7. 85
15	9. 752475	3. 35	0. 114540	7. 72	15	9. 764430	3. 30	0. 142569	7. 87
16	. 752676	3. 35	. 115003	7. 72	16	. 764628	3. 28	. 143041	7. 85
17	. 752877	3. 35	. 115466	7. 72	17	. 764825	3. 28	. 143512	7. 87
18	. 753078	3. 35	. 115929	7. 73	18	. 765022	3. 28	. 143984	7. 87
19	. 753279	3. 35	. 116393	7. 73	19	. 765219	3. 28	. 144456	7. 87
20	9. 753480	3. 35	0. 116857	7. 73	20	9. 765416	3. 28	0. 144928	7. 87
21	. 753681	3. 33	. 117321	7. 73	21	. 765613	3. 28	. 145400	7. 87
22	. 753881	3. 35	. 117785	7. 73	22	. 765810	3. 28	. 145872	7. 88
23	. 754082	3. 35	. 118249	7. 73	23	. 766007	3. 28	. 146345	7. 88
24	. 754283	3. 33	. 118713	7. 73	24	. 766204	3. 28	. 146818	7. 87
25	9. 754483	3. 35	0. 119177	7. 75	25	9. 766401	3. 27	0. 147290	7. 88
26	. 754684	3. 33	. 119642	7. 73	26	. 766597	3. 28	. 147763	7. 88
27	. 754884	3. 35	. 120106	7. 75	27	. 766794	3. 28	. 148236	7. 90
28	. 755085	3. 33	. 120571	7. 75	28	. 766991	3. 27	. 148710	7. 88
29	. 755285	3. 33	. 121036	7. 75	29	. 767187	3. 28	. 149183	7. 90
30	9. 755485	3. 33	0. 121501	7. 75	30	9. 767384	3. 27	0. 149657	7. 88
31	. 755685	3. 35	. 121966	7. 75	31	. 767580	3. 27	. 150130	7. 90
32	. 755886	3. 33	. 122431	7. 77	32	. 767776	3. 27	. 150604	7. 90
33	. 756086	3. 33	. 122897	7. 75	33	. 767972	3. 28	. 151078	7. 90
34	. 756286	3. 33	. 123362	7. 77	34	. 768169	3. 27	. 151552	7. 92
35	9. 756486	3. 32	0. 123828	7. 77	35	9. 768365	3. 27	0. 152027	7. 90
36	. 756685	3. 33	. 124294	7. 77	36	. 768561	3. 27	. 152501	7. 92
37	. 756885	3. 33	. 124760	7. 77	37	. 768757	3. 27	. 152976	7. 90
38	. 757085	3. 33	. 125226	7. 77	38	. 768953	3. 27	. 153450	7. 92
39	. 757285	3. 32	. 125692	7. 77	39	. 769149	3. 25	. 153925	7. 92
40	9. 757484	3. 33	0. 126158	7. 78	40	9. 769344	3. 27	0. 154400	7. 93
41	. 757684	3. 32	. 126625	7. 78	41	. 769540	3. 27	. 154876	7. 92
42	. 757883	3. 33	. 127092	7. 77	42	. 769736	3. 25	. 154535	7. 92
43	. 758083	3. 32	. 127558	7. 78	43	. 769931	3. 27	. 155826	7. 93
44	. 758282	3. 32	. 128025	7. 78	44	. 770127	3. 27	. 156302	7. 93
45	9. 758481	3. 33	0. 128492	7. 80	45	9. 770323	3. 25	0. 156778	7. 93
46	. 758681	3. 32	. 128960	7. 78	46	. 770518	3. 25	. 157254	7. 93
47	. 758880	3. 32	. 129427	7. 78	47	. 770713	3. 27	. 157730	7. 93
48	. 759079	3. 32	. 129894	7. 80	48	. 770909	3. 25	. 158206	7. 95
49	. 759278	3. 32	. 130362	7. 80	49	. 771104	3. 25	. 158683	7. 93
50	9. 759477	3. 32	0. 130830	7. 80	50	9. 771299	3. 25	0. 159159	7. 95
51	. 759676	3. 32	. 131298	7. 80	51	. 771494	3. 25	. 159636	7. 95
52	. 759875	3. 30	. 131766	7. 80	52	. 771689	3. 25	. 160113	7. 95
53	. 760073	3. 32	. 132234	7. 80	53	. 771884	3. 25	. 160590	7. 95
54	. 760272	3. 32	. 132702	7. 80	54	. 772079	3. 25	. 161067	7. 97
55	9. 760471	3. 30	0. 133170	7. 82	55	9. 772274	3. 25	0. 161545	7. 95
56	. 760669	3. 32	. 133639	7. 82	56	. 772469	3. 25	. 162022	7. 97
57	. 760868	3. 30	. 134108	7. 82	57	. 772664	3. 23	. 162500	7. 97
58	. 761066	3. 32	. 134577	7. 82	58	. 772858	3. 25	. 162978	7. 97
59	. 761265	3. 30	. 135046	7. 82	59	. 773053	3. 25	. 163456	7. 97
60	9. 761463		0. 135515		60	9. 773248		0. 163934	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

66°					67°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 773248	3. 23	0. 163934	7. 98	0	9. 784809	3. 18	0. 192931	8. 15
1	. 773442	3. 23	. 164413	7. 97	1	. 785000	3. 18	. 193420	8. 13
2	. 773636	3. 25	. 164891	7. 98	2	. 785191	3. 17	. 193908	8. 15
3	. 773831	3. 23	. 165370	7. 98	3	. 785381	3. 18	. 194397	8. 15
4	. 774025	3. 23	. 165849	7. 98	4	. 785572	3. 18	. 194886	8. 17
5	9. 774219	3. 25	0. 166328	7. 98	5	9. 785763	3. 17	0. 195376	8. 15
6	. 774414	3. 23	. 166807	7. 98	6	. 785953	3. 18	. 195865	8. 17
7	. 774608	3. 23	. 167286	8. 00	7	. 786144	3. 17	. 196355	8. 17
8	. 774802	3. 23	. 167766	7. 98	8	. 786334	3. 17	. 196845	8. 17
9	. 774996	3. 23	. 168245	8. 00	9	. 786524	3. 18	. 197335	8. 17
10	9. 775190	3. 23	0. 168725	8. 00	10	9. 786715	3. 17	0. 197825	8. 17
11	. 775384	3. 22	. 169205	8. 00	11	. 786905	3. 17	. 198315	8. 18
12	. 775577	3. 23	. 169685	8. 00	12	. 787095	3. 17	. 198806	8. 18
13	. 775771	3. 23	. 170165	8. 02	13	. 787285	3. 17	. 199297	8. 18
14	. 775965	3. 23	. 170646	8. 02	14	. 787475	3. 17	. 199788	8. 18
15	9. 776159	3. 22	0. 171127	8. 00	15	9. 787665	3. 17	0. 200279	8. 18
16	. 776352	3. 23	. 171607	8. 02	16	. 787855	3. 17	. 200770	8. 20
17	. 776546	3. 22	. 172088	8. 02	17	. 788045	3. 17	. 201262	8. 18
18	. 776739	3. 23	. 172569	8. 03	18	. 788235	3. 17	. 201753	8. 20
19	. 776933	3. 22	. 173051	8. 02	19	. 788425	3. 15	. 202245	8. 20
20	9. 777126	3. 22	0. 173532	8. 03	20	9. 788614	3. 17	0. 202737	8. 20
21	. 777319	3. 22	. 174014	8. 03	21	. 788804	3. 15	. 203229	8. 22
22	. 777512	3. 22	. 174496	8. 03	22	. 788993	3. 17	. 203722	8. 22
23	. 777705	3. 23	. 174978	8. 03	23	. 789183	3. 15	. 204215	8. 20
24	. 777899	3. 22	. 175460	8. 03	24	. 789372	3. 17	. 204707	8. 22
25	9. 778092	3. 22	0. 175942	8. 05	25	9. 789562	3. 15	0. 205200	8. 23
26	. 778285	3. 20	. 176425	8. 03	26	789751	3. 15	. 205694	8. 22
27	. 778477	3. 22	. 176907	8. 05	27	. 789940	3. 17	. 206187	8. 23
28	. 778670	3. 22	. 177390	8. 05	28	. 790130	3. 15	. 206681	8. 22
29	. 778863	3. 22	. 177873	8. 05	29	. 790319	3. 15	. 207174	8. 23
30	9. 779506	3. 20	0. 178356	8. 05	30	9. 790508	3. 15	0. 207668	8. 23
31	. 779248	3. 22	. 178839	8. 07	31	. 790697	3. 15	. 208162	8. 25
32	. 779441	3. 22	. 179323	8. 07	32	. 790886	3. 15	. 208657	8. 23
33	. 779634	3. 20	. 179807	8. 05	33	. 791075	3. 15	. 209151	8. 25
34	. 779826	3. 20	. 180290	8. 07	34	. 791264	3. 15	. 209646	8. 25
35	9. 780018	3. 22	0. 180774	8. 08	35	9. 791453	3. 13	0. 210141	8. 25
36	. 780211	3. 20	. 181259	8. 07	36	. 791641	3. 15	. 210636	8. 25
37	. 780403	3. 20	. 181743	8. 07	37	. 791830	3. 15	. 211131	8. 27
38	. 780595	3. 20	. 182227	8. 08	38	. 792019	3. 13	. 211627	8. 27
39	. 780787	3. 22	. 182712	8. 08	39	. 792207	3. 15	. 212123	8. 25
40	9. 780980	3. 20	0. 183197	8. 08	40	9. 792396	3. 13	0. 212618	8. 28
41	. 781172	3. 20	. 183682	8. 08	41	. 792584	3. 13	. 213115	8. 27
42	. 781364	3. 20	. 184167	8. 10	42	. 792772	3. 15	. 213611	8. 27
43	. 781556	3. 18	. 184653	8. 08	43	. 792961	3. 13	. 214107	8. 28
44	. 781747	3. 20	. 185138	8. 10	44	. 793149	3. 13	. 214604	8. 28
45	9. 781939	3. 20	0. 185624	8. 10	45	9. 793337	3. 13	0. 215101	8. 28
46	. 782131	3. 20	. 186110	8. 10	46	. 793525	3. 15	. 215598	8. 28
47	. 782323	3. 18	. 186596	8. 10	47	. 793714	3. 13	. 216095	8. 30
48	. 782514	3. 20	. 187082	8. 10	48	. 793902	3. 13	. 216593	8. 28
49	. 782706	3. 18	. 187568	8. 12	49	. 794090	3. 12	. 217090	8. 30
50	9. 782897	3. 20	0. 188055	8. 12	50	9. 794277	3. 13	0. 217588	8. 30
51	. 783089	3. 18	. 188542	8. 12	51	. 794465	3. 13	. 218086	8. 32
52	. 783280	3. 18	. 189029	8. 12	52	. 794653	3. 13	. 218585	8. 30
53	. 783471	3. 20	. 189516	8. 12	53	. 794841	3. 12	. 219083	8. 32
54	. 783663	3. 18	. 190003	8. 13	54	. 795028	3. 13	. 219582	8. 32
55	9. 783854	3. 18	0. 190491	8. 12	55	9. 795216	3. 13	0. 220081	8. 32
56	. 784045	3. 18	. 190978	8. 13	56	. 795404	3. 12	. 220580	8. 32
57	. 784236	3. 18	. 191466	8. 13	57	. 795591	3. 13	. 221079	8. 32
58	. 784427	3. 18	. 191954	8. 15	58	. 795779	3. 12	. 221578	8. 33
59	. 784618	3. 18	. 192443	8. 13	59	. 795966	3. 12	. 222078	8. 33
60	9. 784809		0. 192931		60	9. 796153		0. 222578	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

68°					69°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 796153		0. 222578		0	9. 807286		0. 252957	
1	. 796341	3. 13	. 223078	8. 33	1	. 807470	3. 07	. 253470	8. 55
2	. 796528	3. 12	. 223578	8. 33	2	. 807654	3. 07	. 253983	8. 55
3	. 796715	3. 12	. 224079	8. 35	3	. 807837	3. 05	. 254497	8. 57
4	. 796902	3. 12	. 224579	8. 33	4	. 808021	3. 07	. 255010	8. 53
5	9. 797089	3. 12	0. 225080	8. 35	5	9. 808204	3. 07	0. 255524	8. 57
6	. 797276	3. 12	. 225581	8. 35	6	. 808388	3. 05	. 256039	8. 58
7	. 797463	3. 12	. 226083	8. 37	7	. 808571	3. 07	. 256553	8. 57
8	. 797650	3. 12	. 226584	8. 35	8	. 808755	3. 05	. 257068	8. 58
9	. 797837	3. 10	. 227086	8. 37	9	. 808938	3. 05	. 257582	8. 57
10	9. 798023	3. 12	0. 227588	8. 37	10	9. 809121	3. 07	0. 258098	8. 60
11	. 798210	3. 12	. 228090	8. 37	11	. 809305	3. 05	. 258613	8. 58
12	. 798397	3. 10	. 228592	8. 38	12	. 809488	3. 05	. 259129	8. 60
13	. 798583	3. 12	. 229095	8. 38	13	. 809671	3. 05	. 259644	8. 58
14	. 798770	3. 10	. 229598	8. 38	14	. 809854	3. 05	. 260160	8. 60
15	9. 798956	3. 10	0. 230101	8. 38	15	9. 810037	3. 05	0. 260677	8. 62
16	. 799142	3. 12	. 230604	8. 38	16	. 810220	3. 05	. 261193	8. 60
17	. 799329	3. 10	. 231107	8. 40	17	. 810403	3. 03	261710	8. 62
18	. 799515	3. 10	. 231611	8. 40	18	. 810585	3. 05	. 262227	8 62
19	. 799701	3. 10	. 232115	8. 40	19	. 810768	3. 05	. 262744	8. 62
20	9. 799887	3. 12	0. 232619	8. 40	20	9. 810951	3. 05	0. 263262	8. 63
21	. 800074	3. 10	. 233123	8. 40	21	. 811134	3. 03	. 263779	8. 62
22	. 800260	3. 10	. 233627	8. 42	22	. 811316	3. 05	. 264297	8. 63
23	. 800446	3. 08	. 234132	8. 42	23	. 811499	3. 03	. 264815	8. 63
24	. 800631	3. 10	. 234637	8. 42	24	. 811681	3. 05	. 265334	8. 65
25	9. 800817	3. 10	0. 235142	8. 42	25	9. 811864	3. 03	0. 265853	8. 65
26	. 801003	3. 10	. 235674	8. 43	26	. 812046	3. 03	. 266371	8. 63
27	. 801189	3. 10	. 236153	8. 42	27	. 812228	3. 03	. 266891	8. 67
28	. 801375	3. 08	. 236658	8. 43	28	. 812410	3. 05	. 267410	8. 65
29	. 801560	3. 10	. 237164	8. 43	29	. 812593	3. 03	. 267930	8. 67
30	9. 801746	3. 08	0. 237670	8. 45	30	9. 812775	3. 03	0. 268449	8. 65
31	. 801931	3. 10	. 238177	8. 43	31	. 812957	3. 03	. 268970	8. 68
32	. 802117	3. 08	. 238683	8. 45	32	. 813139	3. 03	. 269490	8. 67
33	. 802302	3. 08	. 239190	8. 45	33	. 813321	3. 03	. 270011	8. 68
34	. 802487	3. 10	. 239697	8. 45	34	. 813503	3. 03	. 270531	8. 67
35	9. 802673	3. 08	0. 240204	8. 47	35	9. 813685	3. 02	0. 271052	8. 68
36	. 802858	3. 08	. 240712	8. 45	36	. 813866	3. 03	. 271574	8. 70
37	. 803043	3. 08	. 241219	8. 47	37	. 814048	3. 03	. 272095	8. 68
38	. 803228	3. 08	. 241727	8. 47	38	. 814230	3. 03	. 272617	8. 70
39	. 803413	3. 08	. 242235	8. 48	39	. 814411	3. 02	. 273139	8. 70
40	9. 803598	3. 08	0. 242744	8. 47	40	9. 814593	3. 03	0. 273662	8. 72
41	. 803783	3. 08	. 243252	8. 48	41	. 814775	3. 02	. 274184	8. 70
42	. 803968	3. 08	. 243761	8. 48	42	. 814956	3. 02	. 274707	8. 72
43	. 804153	3. 08	. 244270	8. 48	43	. 815137	3. 03	275230	8. 72
44	. 804338	3. 07	. 244779	8. 50	44	. 815319	3. 02	. 275753	8. 73
45	9. 804522	3. 08	0. 245289	8. 48	45	9. 815500	3. 02	0. 276277	8. 73
46	. 804707	3. 08	. 245798	8. 50	46	. 815681	3. 02	. 276801	8. 73
47	. 804892	3. 07	. 246308	8. 50	47	. 815862	3. 03	. 277325	8. 73
48	. 805076	3. 08	. 246818	8. 52	48	. 816044	3. 02	. 277849	8. 75
49	. 805261	3. 07	. 247329	8. 50	49	. 816225	3. 02	. 278374	8. 75
50	9. 805445	3. 07	0. 247839	8. 52	50	9. 816406	3. 02	0. 278899	8. 75
51	. 805629	3. 08	. 248350	8. 52	51	. 816587	3. 00	. 279424	8. 75
52	. 805814	3. 07	. 248861	8. 52	52	. 816767	3. 02	. 279949	8. 77
53	. 805998	3. 07	. 249372	8. 52	53	. 816948	3. 02	. 280475	8. 75
54	. 806182	3. 07	. 249883	8. 53	54	. 817129	3. 02	. 281000	8. 78
55	9. 806366	3. 07	0. 250395	8. 53	55	9. 817310	3. 00	0. 281527	8. 77
56	. 806550	3. 07	. 250907	8. 53	56	. 817490	3. 02	. 282053	8. 78
57	. 806734	3. 07	. 251419	8. 55	57	. 817671	3. 02	. 282580	8. 77
58	. 806918	3. 07	. 251932	8. 53	58	. 817852	3. 00	. 283106	8. 80
59	. 807102	3. 07	. 252444	8. 55	59	. 818032	3. 02	. 283634	8. 78
60	9. 807286		0. 252957		60	9. 818213		0. 284161	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

70°					71°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 818213		0. 284161		0	9. 828938		0. 316296	
		3. 00		8. 80			2. 95		9. 07
1	. 818393	3. 00	. 284689	8. 78	1	. 829115	2. 95	. 316840	9. 08
2	. 818573	3. 02	. 285216	8. 82	2	. 829292	2. 95	. 317385	9. 07
3	. 818754	3. 00	. 285745	8. 80	3	. 829469	2. 95	. 317929	9. 10
4	. 818934	3. 00	. 286273	8. 82	4	. 829646	2. 95	. 318475	9. 08
5	9. 819114		0. 286802		5	9. 829823		0. 319020	
		3. 00		8. 82			2. 95		9. 08
6	. 819294	3. 00	. 287331	8. 82	6	. 830000	2. 95	. 319565	9. 10
7	. 819474	3. 00	. 287860	8. 82	7	. 830177	2. 93	. 320111	9. 12
8	. 819654	3. 00	. 288389	8. 83	8	. 830353	2. 95	. 320658	9. 10
9	. 819834	3. 00	. 288919	8. 83	9	. 830530	2. 93	. 321204	9. 12
10	9. 820014		0. 289449		10	9. 830706		0. 321751	
		3. 00		8. 83			2. 95		9. 12
11	. 820194	3. 00	. 289979	8. 85	11	. 830883	2. 93	. 322298	9. 12
12	. 820374	2. 98	. 290510	8. 85	12	. 831059	2. 95	. 322845	9. 13
13	. 820553	3. 00	. 291041	8. 85	13	. 831236	2. 93	. 323393	9. 13
14	. 820733	3. 00	. 291572	8. 85	14	. 831412	2. 95	. 323941	9. 13
15	9. 820913		0. 292103		15	9. 831589		0. 324489	
		2. 98		8. 87			2. 93		9. 15
16	. 821092	3. 00	. 292635	8. 85	16	. 831765	2. 93	. 325038	9. 15
17	. 821272	2. 98	. 293166	8. 87	17	. 831941	2. 93	. 325587	9. 15
18	. 821451	3. 00	. 293698	8. 88	18	. 832117	2. 93	. 326136	9. 17
19	. 821631	2. 98	. 294231	8. 88	19	. 832293	2. 93	. 326686	9. 15
20	9. 821810		0. 294764		20	9. 832469		0. 327235	
		2. 98		8. 87			2. 93		9. 18
21	. 821989	2. 98	. 295296	8. 90	21	. 832645	2. 93	. 327786	9. 17
22	. 822168	3. 00	. 295830	8. 88	22	. 832821	2. 93	. 328336	9. 18
23	. 822348	2. 98	. 296363	8. 90	23	. 832997	2. 93	. 328887	9. 18
24	. 822527	2. 98	. 296897	8. 90	24	. 833173	2. 93	. 329438	9. 18
25	9. 822706		0. 297431		25	9. 833349		0. 329989	
		2. 98		8. 90			2. 93		9. 20
26	. 822885	2. 98	. 297965	8. 92	26	. 833525	2. 92	. 330541	9. 20
27	. 823064	2. 98	. 298500	8. 90	27	. 833700	2. 93	. 331093	9. 20
28	. 823243	2. 97	. 299034	8. 93	28	. 833876	2. 92	. 331645	9. 22
29	. 823421	2. 98	. 299570	8. 92	29	. 834051	2. 93	. 332198	9. 20
30	9. 823600		0. 300105		30	9. 834227		0. 332750	
		2. 98		8. 93			2. 92		9. 23
31	. 823779	2. 98	. 300641	8. 92	31	. 834402	2. 93	. 333304	9. 22
32	. 823958	2. 97	. 301176	8. 95	32	. 834578	2. 92	. 333857	9. 23
33	. 824136	2. 98	. 301813	8. 93	33	. 834753	2. 92	. 334411	9. 23
34	. 824315	2. 97	. 302249	8. 95	34	. 834928	2. 93	. 334965	9. 25
35	9. 824493		0. 302786		35	9. 835104		0. 335520	
		2. 98		8. 95			2. 92		9. 23
36	. 824672	2. 97	. 303323	8. 95	36	. 835279	2. 92	. 336074	9. 25
37	. 824850	2. 97	. 303860	8. 97	37	. 835454	2. 92	. 336629	9. 27
38	. 825028	2. 98	. 304398	8. 97	38	. 835629	2. 92	. 337185	9. 27
39	. 825207	2. 97	. 304936	8. 97	39	. 835804	2. 92	. 337741	9. 27
40	9. 825384		0. 305474		40	9. 835979		0. 338297	
		2. 97		8. 97			2. 92		9. 27
41	. 825563	2. 97	. 306012	8. 98	41	. 836154	2. 92	. 338853	9. 28
42	. 825741	2. 97	. 306551	8. 98	42	. 836329	2. 92	. 339410	9. 28
43	. 825919	2. 97	. 307090	8. 98	43	. 836504	2. 90	. 339967	9. 28
44	. 826097	2. 97	. 307629	9. 00	44	. 836678	2. 92	. 340524	9. 30
45	9. 826275		0. 308169		45	9. 836853		0. 341082	
		2. 97		8. 98			2. 92		9. 30
46	. 826453	2. 97	. 308708	9. 02	46	. 837028	2. 90	. 341640	9. 30
47	. 826631	2. 97	. 309249	9. 00	47	. 837202	2. 92	. 342198	9. 30
48	. 826809	2. 97	. 309789	9. 02	48	. 837377	2. 90	. 342756	9. 32
49	. 826987	2. 95	. 310330	9. 02	49	. 837551	2. 92	. 343315	9. 33
50	9. 827164		0. 310871		50	9. 837726		0. 343875	
		2. 97		9. 02			2. 90		9. 32
51	. 827342	2. 95	. 311412	9. 02	51	. 837900	2. 92	. 344434	9. 33
52	. 827519	2. 97	. 311953	9. 03	52	. 838075	2. 90	. 344994	9. 33
53	. 827697	2. 95	. 312495	9. 03	53	. 838249	2. 90	. 345554	9. 35
54	. 827874	2. 97	. 313037	9. 05	54	. 838423	2. 90	. 346115	9. 35
55	9. 828052		0. 313580		55	9. 838597		0. 346676	
		2. 95		9. 03			2. 90		9. 35
56	. 828229	2. 95	. 314122	9. 05	56	. 838771	2. 90	. 347237	9. 35
57	. 828406	2. 97	. 314665	9. 07	57	. 838945	2. 90	. 347798	9. 37
58	. 828584	2. 95	. 315209	9. 05	58	. 839119	2. 90	. 348360	9. 37
59	. 828761	2. 95	. 315752	9. 07	59	. 839293	2. 90	. 348922	9. 38
60	9. 828938		0. 316296		60	9. 839467		0. 349485	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

72°					73°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.839467		0.349485		0	9.849805		0.383870	
		2.90		9.38			2.85		9.73
1	.839641	2.90	.350048	9.38	1	.849976	2.85	.384454	9.73
2	.839815	2.90	.350611	9.40	2	.850147	2.83	.385038	9.75
3	.839989	2.88	.351175	9.38	3	.850317	2.85	.385623	9.77
4	.840162	2.90	.351738	9.42	4	.850488	2.83	.386209	9.75
5	9.840336		0.352303		5	9.850658		0.386794	
		2.90		9.40			2.85		9.77
6	.840510	2.88	.352867	9.42	6	.850829	2.83	.387380	9.78
7	.840683	2.90	.353432	9.42	7	.850999	2.83	.387967	9.78
8	.840857	2.88	.353997	9.43	8	.851169	2.85	.388554	9.78
9	.841030	2.90	.354563	9.43	9	.851340	2.83	.389141	9.78
10	9.841204		0.355129		10	9.851510		0.389728	
		2.88		9.43			2.83		9.80
11	.841377	2.88	.355695	9.43	11	.851680	2.83	.390316	9.82
12	.841550	2.88	.356261	9.45	12	.851850	2.83	.390905	9.80
13	.841723	2.88	.356828	9.45	13	.852020	2.83	.391493	9.82
14	.841896	2.90	.357395	9.47	14	.852190	2.83	.392082	9.83
15	9.842070		0.357963		15	9.852360		0.392672	
		2.88		9.47			2.83		9.83
16	.842243	2.88	.358531	9.47	16	.852530	2.83	.393262	9.83
17	.842416	2.88	.359099	9.48	17	.852700	2.83	.393852	9.85
18	.842589	2.88	.359668	9.48	18	.852870	2.83	.394443	9.85
19	.842762	2.87	.360237	9.48	19	.853040	2.82	.395034	9.85
20	9.842934		0.360806		20	9.853209		0.395625	
		2.88		9.50			2.83		9.87
21	.843107	2.88	.361376	9.50	21	.853379	2.83	.396217	9.87
22	.843280	2.88	.361946	9.50	22	.853549	2.82	.396809	9.88
23	.843453	2.87	.362516	9.52	23	.853718	2.83	.397402	9.88
24	.843625	2.88	.363087	9.52	24	.853888	2.82	.397995	9.90
25	9.843798		0.363658		25	9.854057		0.398589	
		2.87		9.52			2.83		9.88
26	.843970	2.88	.364229	9.53	26	.854227	2.82	.399182	9.92
27	.844143	2.87	.364801	9.53	27	.854396	2.82	.399777	9.90
28	.844315	2.88	.365373	9.53	28	.854565	2.83	.400371	9.92
29	.844488	2.87	.365945	9.55	29	.854735	2.82	.400966	9.93
30	9.844660		0.366518		30	9.854904		0.401562	
		2.87		9.55			2.82		9.93
31	.844832	2.87	.367091	9.57	31	.855073	2.82	.402158	9.93
32	.845004	2.88	.367665	9.57	32	.855242	2.82	.402754	9.95
33	.845177	2.87	.368239	9.57	33	.855411	2.82	.403351	9.95
34	.845349	2.87	.368813	9.57	34	.855580	2.82	.403948	9.95
35	9.845521		0.369387		35	9.855749		0.404545	
		2.87		9.58			2.82		9.97
36	.845693	2.87	.369962	9.60	36	.855918	2.82	.405143	9.98
37	.845865	2.87	.370538	9.58	37	.856087	2.80	.405742	9.97
38	.846037	2.85	.371113	9.60	38	.856255	2.82	.406340	9.98
39	.846208	2.87	.371689	9.62	39	.856424	2.82	.406939	10.00
40	9.846380		0.372266		40	9.856593		0.407539	
		2.87		9.60			2.82		10.00
41	.846552	2.87	.372842	9.62	41	.856762	2.80	.408139	10.00
42	.846724	2.85	.373419	9.63	42	.856930	2.82	.408739	10.02
43	.846895	2.87	.373997	9.63	43	.857099	2.80	.409340	10.02
44	.847067	2.85	.374575	9.63	44	.857267	2.82	.409941	10.03
45	9.847238		0.375153		45	9.857436		0.410543	
		2.87		9.63			2.80		10.03
46	.847410	2.85	.375731	9.65	46	.857604	2.80	.411145	10.03
47	.847581	2.87	.376310	9.67	47	.857772	2.82	.411747	10.05
48	.847753	2.85	.376890	9.65	48	.857941	2.80	.412350	10.07
49	.847924	2.85	.377469	9.67	49	.858109	2.80	.412954	10.05
50	9.848095		0.378049		50	9.858277		0.413557	
		2.87		9.68			2.80		10.07
51	.848267	2.85	.378630	9.67	51	.858445	2.80	.414161	10.08
52	.848438	2.85	.379210	9.70	52	.858613	2.80	.414766	10.08
53	.848609	2.85	.379792	9.68	53	.858781	2.80	.415371	10.08
54	.848780	2.85	.380373	9.70	54	.858949	2.80	.415976	10.10
55	9.848951		0.380955		55	9.859117		0.416582	
		2.85		9.70			2.80		10.12
56	.849122	2.85	.381537	9.72	56	.859285	2.80	.417189	10.10
57	.849293	2.85	.382120	9.72	57	.859453	2.80	.417795	10.12
58	.849464	2.83	.382703	9.72	58	.859621	2.78	.418402	10.13
59	.849634	2.85	.383286	9.73	59	.859788	2.80	.419010	10.13
60	9.849805		0.383870		60	9.859956		0.419618	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

74°					75°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.859956		0.419618		0	9.869924		0.456928	
		2.80		10.13			2.75		10.60
1	.860124		.420226		1	.870089		.457564	
		2.78		10.15			2.73		10.62
2	.860291		.420835		2	.870253		.458201	
		2.80		10.17			2.75		10.63
3	.860459		.421445		3	.870418		.458839	
		2.78		10.15			2.73		10.62
4	.860626		.422054		4	.870582		.459476	
		2.80		10.17			2.75		10.65
5	9.860794		0.422664		5	9.870747		0.460115	
		2.78		10.18			2.73		10.65
6	.860961		.423275		6	.870911		.460754	
		2.78		10.18			2.75		10.65
7	.861128		.423886		7	.871076		.461393	
		2.80		10.20			2.73		10.67
8	.861296		.424498		8	.871240		.462033	
		2.78		10.20			2.73		10.67
9	.861463		.425110		9	.871404		.462673	
		2.78		10.20			2.73		10.68
10	9.861630		0.425722		10	9.871568		0.463314	
		2.78		10.22			2.73		10.70
11	.861797		.426335		11	.871732		.463956	
		2.78		10.22			2.73		10.70
12	.861964		.426948		12	.871896		.464598	
		2.78		10.23			2.73		10.70
13	.862131		.427562		13	.872060		.465240	
		2.78		10.23			2.73		10.72
14	.862298		.428176		14	.872224		.465883	
		2.78		10.23			2.73		10.73
15	9.862465		0.428790		15	9.872388		0.466527	
		2.78		10.27			2.73		10.73
16	.862632		.429406		16	.872552		.467171	
		2.78		10.25			2.73		10.73
17	.862799		.430021		17	.872716		.467815	
		2.77		10.27			2.73		10.75
18	.862965		.430637		18	.872880		.468460	
		2.78		10.27			2.72		10.77
19	.863132		.431253		19	.873043		.469106	
		2.78		10.28			2.73		10.77
20	9.863299		0.431870		20	9.873207		0.469752	
		2.77		10.30			2.73		10.77
21	.863465		.432488		21	.873371		.470398	
		2.78		10.28			2.72		10.78
22	.863632		.433105		22	.873534		.471045	
		2.78		10.32			2.73		10.80
23	.863799		.433724		23	.873698		.471693	
		2.77		10.30			2.72		10.80
24	.863965		.434342		24	.873861		.472341	
		2.77		10.32			2.73		10.82
25	9.864131		0.434961		25	9.874025		0.472990	
		2.78		10.33			2.72		10.82
26	.864298		.435581		26	.874188		.473639	
		2.77		10.33			2.72		10.83
27	.864464		.436201		27	.874351		.474289	
		2.77		10.33			2.73		10.83
28	.864630		.436821		28	.874515		.474939	
		2.78		10.35			2.72		10.85
29	.864797		.437442		29	.874678		.475590	
		2.77		10.37			2.72		10.87
30	9.864963		0.438064		30	9.874841		0.476242	
		2.77		10.37			2.72		10.85
31	.865129		.438686		31	.875004		.476893	
		2.77		10.37			2.72		10.88
32	.865295		.439308		32	.875167		.477546	
		2.77		10.38			2.72		10.88
33	.865461		.439931		33	.875330		.478199	
		2.77		10.38			2.72		10.88
34	.865627		.440554		34	.875493		.478852	
		2.77		10.40			2.72		10.90
35	9.865793		0.441178		35	9.875656		0.479506	
		2.77		10.40			2.72		10.92
36	.865959		.441802		36	.875819		.480161	
		2.75		10.42			2.72		10.92
37	.866124		.442427		37	.875982		.480816	
		2.77		10.42			2.72		10.93
38	.866290		.443052		38	.876145		.481472	
		2.77		10.43			2.72		10.93
39	.866456		.443678		39	.876308		.482128	
		2.77		10.43			2.70		10.95
40	9.866622		0.444304		40	9.876470		0.482785	
		2.75		10.45			2.72		10.95
41	.866787		.444931		41	.876633		.483442	
		2.77		10.45			2.72		10.97
42	.866953		.445558		42	.876796		.484100	
		2.75		10.45			2.70		10.98
43	.867118		.446185		43	.876958		.484759	
		2.77		10.47			2.72		10.98
44	.867284		.446813		44	.877121		.485418	
		2.75		10.48			2.70		10.98
45	9.867449		0.447442		45	9.877283		0.486077	
		2.75		10.48			2.70		11.02
46	.867614		.448071		46	.877445		.486738	
		2.77		10.48			2.72		11.00
47	.867780		.448700		47	.877608		.487398	
		2.75		10.50			2.70		11.02
48	.867945		.449330		48	.877770		.488059	
		2.75		10.52			2.70		11.03
49	.868110		.449961		49	.877932		.488721	
		2.75		10.52			2.72		11.05
50	9.868275		0.450592		50	9.878095		0.489384	
		2.75		10.52			2.70		11.05
51	.868480		.451223		51	.878257		.490047	
		2.77		10.53			2.70		11.05
52	.868606		.451855		52	.878419		.490710	
		2.75		10.53			2.70		11.07
53	.868771		.452487		53	.878581		.491374	
		2.75		10.55			2.70		11.08
54	.868936		.453120		54	.878743		.492039	
		2.73		10.57			2.70		11.08
55	9.869100		0.453754		55	9.878905		0.492704	
		2.75		10.57			2.70		11.10
56	.869265		.454388		56	.879067		.493370	
		2.75		10.57			2.70		11.10
57	.869430		.455022		57	.879229		.494036	
		2.75		10.58			2.68		11.12
58	.869595		.455657		58	.879390		.494703	
		2.75		10.58			2.70		11.13
59	.869760		.456292		59	.879552		.495371	
		2.73		10.60			2.70		11.13
60	9.869924		0.456928		60	9.879714		0.496039	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

76°					77°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.879714	2.70	0.496039	11.13	0	9.889329	2.65	0.537241	11.77
1	.879876	2.68	.496707	11.17	1	.889488	2.65	.537947	11.78
2	.880037	2.70	.497377	11.17	2	.889647	2.63	.538654	11.80
3	.880199	2.68	.498047	11.17	3	.889805	2.65	.539362	11.82
4	.880360	2.70	.498717	11.18	4	.889964	2.65	.540071	11.82
5	9.880522	2.68	0.499388	11.20	5	9.890123	2.63	0.540780	11.83
6	.880683	2.70	.500060	11.20	6	.890281	2.65	.541490	11.83
7	.880845	2.68	.500732	11.22	7	.890440	2.63	.542200	11.85
8	.881006	2.68	.501405	11.22	8	.890598	2.65	.542911	11.87
9	.881167	2.68	.502078	11.23	9	.890757	2.63	.543623	11.88
10	9.881328	2.70	0.502752	11.23	10	9.890915	2.63	0.544336	11.88
11	.881490	2.68	.503426	11.27	11	.891073	2.65	.545049	11.90
12	.881651	2.68	.504102	11.25	12	.891232	2.63	.545763	11.90
13	.881812	2.68	.504777	11.28	13	.891390	2.63	.546477	11.93
14	.881973	2.68	.505454	11.28	14	.891548	2.63	.547193	11.93
15	9.882134	2.68	0.506131	11.28	15	9.891706	2.63	0.547909	11.95
16	.882295	2.68	.506808	11.30	16	.891864	2.63	.548626	11.95
17	.882456	2.68	.507486	11.32	17	.892022	2.63	.549343	11.97
18	.882617	2.67	.508165	11.32	18	.892180	2.63	.550061	11.98
19	.882777	2.68	.508844	11.33	19	.892338	2.63	.550780	12.00
20	9.882938	2.68	0.509524	11.35	20	9.892496	2.63	0.551500	12.00
21	.883099	2.68	.510205	11.35	21	.892654	2.63	.552220	12.02
22	.883260	2.67	.510886	11.37	22	.892812	2.62	.552941	12.03
23	.883420	2.68	.511568	11.37	23	.892969	2.63	.553663	12.03
24	.883581	2.67	.512250	11.38	24	.893127	2.63	.554385	12.07
25	9.883741	2.68	0.512933	11.40	25	9.893285	2.62	0.555109	12.07
26	.883902	2.67	.513617	11.40	26	.893442	2.63	.555833	12.07
27	.884062	2.68	.514301	11.42	27	.893600	2.63	.556557	12.10
28	.884223	2.67	.514986	11.43	28	.893758	2.62	.557283	12.10
29	.884383	2.67	.515672	11.43	29	.893915	2.62	.558009	12.12
30	9.884543	2.67	0.516358	11.45	30	9.894072	2.63	0.558736	12.12
31	.884703	2.68	.517045	11.45	31	.894230	2.62	.559463	12.15
32	.884864	2.67	.517732	11.47	32	.894387	2.62	.560192	12.15
33	.885024	2.67	.518420	11.48	33	.894544	2.63	.560921	12.17
34	.885184	2.67	.519109	11.48	34	.894702	2.62	.561651	12.17
35	9.885344	2.67	0.519798	11.50	35	9.894859	2.62	0.562381	12.20
36	.885504	2.67	.520488	11.52	36	.895016	2.62	.563113	12.20
37	.885664	2.67	.521179	11.52	37	.895173	2.62	.563845	12.20
38	.885824	2.65	.521870	11.53	38	.895330	2.62	.564577	12.23
39	.885983	2.67	.522562	11.53	39	.895487	2.62	.565311	12.23
40	9.886143	2.67	0.523254	11.55	40	9.895644	2.62	0.566045	12.27
41	.886303	2.67	.523947	11.57	41	.895801	2.62	.566781	12.25
42	.886463	2.65	.524641	11.57	42	.895958	2.62	.567516	12.28
43	.886622	2.67	.525335	11.58	43	.896115	2.62	.568253	12.28
44	.886782	2.65	.526030	11.60	44	.896272	2.60	.568990	12.32
45	9.886941	2.67	0.526726	11.62	45	9.896428	2.62	0.569729	12.32
46	.887101	2.65	.527423	11.62	46	.896585	2.62	.570468	12.32
47	.887260	2.67	.528120	11.62	47	.896742	2.60	.571207	12.35
48	.887420	2.65	.528817	11.65	48	.896898	2.62	.571948	12.35
49	.887579	2.67	.529516	11.65	49	.897055	2.60	.572689	12.37
50	9.887739	2.65	0.530215	11.65	50	9.897211	2.62	0.573431	12.38
51	.887898	2.65	.530914	11.67	51	.897368	2.60	.574174	12.38
52	.888057	2.65	.531614	11.68	52	.897524	2.60	.574917	12.42
53	.888216	2.65	.532315	11.70	53	.897680	2.62	.575662	12.42
54	.888375	2.65	.533017	11.70	54	.897837	2.60	.576407	12.43
55	9.888534	2.65	0.533719	11.72	55	9.897993	2.60	0.577153	12.45
56	.888693	2.65	.534422	11.73	56	.898149	2.60	.577900	12.45
57	.888852	2.65	.535126	11.73	57	.898305	2.60	.578647	12.48
58	.889011	2.65	.535830	11.75	58	.898461	2.62	.579396	12.48
59	.889170	2.65	.536535	11.77	59	.898618	2.60	.580145	12.50
60	9.889329		0.537241		60	9.898774		0.580895	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

78°					79°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.898774		0.580895		0	9.908051		0.627452	
		2.60		12.50			2.55		13.40
1	.898930	2.60	.581645	12.53	1	.908204	2.55	.628256	13.40
2	.899086	2.58	.582397	12.53	2	.908357	2.57	.629060	13.43
3	.899241	2.60	.583149	12.57	3	.908511	2.55	.629866	13.45
4	.899397	2.60	.583903	12.57	4	.908664	2.55	.630673	13.45
5	9.899553	2.60	0.584657	12.57	5	9.908817	2.55	0.631480	13.48
6	.899709	2.60	.585411	12.60	6	.908970	2.55	.632289	13.48
7	.899865	2.58	.586167	12.60	7	.909123	2.55	.633098	13.52
8	.900020	2.60	.586923	12.63	8	.909276	2.53	.633909	13.52
9	.900176	2.58	.587681	12.63	9	.909428	2.55	.634720	13.55
10	9.900331		0.588439		10	9.909581		0.635533	
		2.60		12.65			2.55		13.55
11	.900487	2.58	.589198	12.65	11	.909734	2.55	.636346	13.58
12	.900642	2.60	.589957	12.68	12	.909887	2.53	.637161	13.58
13	.900798	2.58	.590718	12.68	13	.910039	2.55	.637976	13.60
14	.900953	2.58	.591479	12.72	14	.910192	2.55	.638792	13.63
15	9.901108	2.60	0.592242	12.72	15	9.910345	2.53	0.639610	13.63
16	.901264	2.58	.593005	12.73	16	.910497	2.55	.640428	13.67
17	.901419	2.58	.593769	12.73	17	.910650	2.53	.641248	13.67
18	.901574	2.58	.594533	12.77	18	.910802	2.55	.642068	13.70
19	.901729	2.58	.595299	12.78	19	.910955	2.53	.642890	13.72
20	9.901884		0.596066		20	9.911107		0.643713	
		2.60		12.78			2.53		13.72
21	.902040	2.58	.596833	12.80	21	.911259	2.55	.644536	13.75
22	.902195	2.58	.597601	12.82	22	.911412	2.53	.645361	13.75
23	.902350	2.57	.598370	12.83	23	.911564	2.53	.646186	13.78
24	.902504	2.58	.599140	12.85	24	.911716	2.53	.647013	13.80
25	9.902659	2.58	0.599911	12.85	25	9.911868	2.53	0.647841	13.82
26	.902814	2.58	.600682	12.88	26	.912020	2.53	.648670	13.82
27	.902969	2.58	.601455	12.88	27	.912172	2.53	.649499	13.85
28	.903124	2.57	.602228	12.92	28	.912324	2.53	.650330	13.87
29	.903278	2.58	.603003	12.92	29	.912476	2.53	.651162	13.88
30	9.903433		0.603778		30	9.912628		0.651995	
		2.58		12.93			2.53		13.90
31	.903588	2.57	.604554	12.95	31	.912780	2.53	.652829	13.92
32	.903742	2.58	.605331	12.95	32	.912932	2.53	.653664	13.95
33	.903897	2.57	.606108	12.98	33	.913084	2.52	.654501	13.95
34	.904051	2.58	.606887	13.00	34	.913235	2.53	.655338	13.97
35	9.904206	2.57	0.607667	13.00	35	9.913387	2.53	0.656176	14.00
36	.904360	2.57	.608447	13.02	36	.913539	2.52	.657016	14.00
37	.904514	2.57	.609228	13.03	37	.913690	2.53	.657856	14.03
38	.904668	2.58	.610010	13.07	38	.913842	2.52	.658698	14.03
39	.904823	2.57	.610794	13.07	39	.913993	2.53	.659540	14.07
40	9.904977		0.611578		40	9.914145		0.660384	
		2.57		13.08			2.52		14.08
41	.905131	2.57	.612363	13.08	41	.914296	2.53	.661229	14.10
42	.905285	2.57	.613148	13.12	42	.914448	2.52	.662075	14.12
43	.905439	2.57	.613935	13.13	43	.914599	2.52	.662922	14.13
44	.905593	2.57	.614723	13.13	44	.914750	2.53	.663770	14.15
45	9.905747	2.57	0.615511	13.17	45	9.914902	2.52	0.664619	14.18
46	.905901	2.57	.616301	13.17	46	.915053	2.52	.665470	14.18
47	.906055	2.57	.617091	13.20	47	.915204	2.52	.666321	14.22
48	.906209	2.57	.617883	13.20	48	.915355	2.52	.667174	14.23
49	.906363	2.55	.618675	13.22	49	.915506	2.52	.668028	14.25
50	9.906516		0.619468		50	9.915657		0.668883	
		2.57		13.23			2.52		14.27
51	.906670	2.57	.620262	13.25	51	.915808	2.52	.669739	14.28
52	.906824	2.55	.621057	13.27	52	.915959	2.52	.670596	14.30
53	.906977	2.57	.621853	13.28	53	.916110	2.52	.671454	14.33
54	.907131	2.55	.622650	13.30	54	.916261	2.52	.672314	14.33
55	9.907284	2.57	0.623448	13.32	55	9.916412	2.50	0.673174	14.37
56	.907438	2.55	.624247	13.33	56	.916562	2.52	.674036	14.38
57	.907591	2.55	.625047	13.35	57	.916713	2.52	.674899	14.40
58	.907744	2.57	.625848	13.37	58	.916864	2.50	.675763	14.42
59	.907898	2.55	.626650	13.37	59	.917014	2.52	.676628	14.45
60	9.908051		0.627452		60	9.917165		0.677495	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

80°					81°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 917165		0. 677495		0	9. 926119		0. 731786	
		2. 52		14. 45			2. 47		15. 78
1	. 917316		. 678362		1	. 926267		. 732733	
		2. 50		14. 48			2. 47		15. 78
2	. 917466		. 679231		2	. 926415		. 733680	
		2. 50		14. 50			2. 45		15. 83
3	. 917616		. 680101		3	. 926562		. 734630	
		2. 52		14. 52			2. 47		15. 83
4	. 917767		. 680972		4	. 926710		. 735580	
		2. 50		14. 55			2. 47		15. 87
5	9. 917917		0. 681845		5	9. 926858		0. 736532	
		2. 52		14. 55			2. 47		15. 90
6	. 918068		. 682718		6	. 927006		. 737486	
		2. 50		14. 58			2. 45		15. 92
7	. 918218		. 683593		7	. 927153		. 738441	
		2. 50		14. 60			2. 47		15. 95
8	. 918368		. 684469		8	. 927301		. 739398	
		2. 50		14. 62			2. 45		15. 97
9	. 918518		. 685346		9	. 927448		. 740356	
		2. 50		14. 63			2. 47		16. 00
10	9. 918668		0. 686224		10	9. 927596		0. 741316	
		2. 50		14. 67			2. 45		16. 02
11	. 918818		. 687104		11	. 927743		. 742277	
		2. 50		14. 68			2. 47		16. 03
12	. 918968		. 687985		12	. 927891		. 743239	
		2. 50		14. 70			2. 45		16. 08
13	. 919118		. 688867		13	. 928038		. 744204	
		2. 50		14. 72			2. 45		16. 08
14	. 919268		. 689750		14	. 928185		. 745169	
		2. 50		14. 73			2. 47		16. 13
15	9. 919418		0. 690634		15	9. 928333		0. 746137	
		2. 50		14. 77			2. 45		16. 13
16	. 919568		. 691520		16	. 928480		. 747105	
		2. 50		14. 78			2. 45		16. 18
17	. 919718		. 692407		17	. 928627		. 748076	
		2. 50		14. 80			2. 45		16. 20
18	. 919868		. 693295		18	. 928774		. 749048	
		2. 50		14. 83			2. 45		16. 22
19	. 920018		. 694185		19	. 928921		. 750021	
		2. 48		14. 83			2. 45		16. 25
20	9. 920167		0. 695075		20	9. 929068		0. 750996	
		2. 50		14. 87			2. 45		16. 28
21	. 920317		. 695967		21	. 929215		. 751973	
		2. 48		14. 90			2. 45		16. 30
22	. 920466		. 696861		22	. 929362		. 752951	
		2. 50		14. 90			2. 45		16. 33
23	. 920616		. 697755		23	. 929509		. 753931	
		2. 50		14. 93			2. 45		16. 35
24	. 920766		. 698651		24	. 929656		. 754912	
		2. 48		14. 95			2. 45		16. 38
25	9. 920915		0. 699548		25	9. 929803		0. 755895	
		2. 48		14. 97			2. 45		16. 42
26	. 921064		. 700446		26	. 929950		. 756880	
		2. 50		15. 00			2. 45		16. 43
27	. 921214		. 701346		27	. 930097		. 757866	
		2. 48		15. 02			2. 43		16. 47
28	. 921363		. 702247		28	. 930243		. 758854	
		2. 48		15. 03			2. 45		16. 50
29	. 921512		. 703149		29	. 930390		. 759844	
		2. 50		15. 05			2. 45		16. 52
30	9. 921662		0. 704052		30	9. 930537		0. 760835	
		2. 48		15. 08			2. 43		16. 53
31	. 921811		. 704957		31	. 930683		. 761827	
		2. 48		15. 10			2. 45		16. 58
32	. 921960		. 705863		32	. 930830		. 762822	
		2. 48		15. 13			2. 43		16. 60
33	. 922109		. 706771		33	. 930976		. 763818	
		2. 48		15. 15			2. 45		16. 62
34	. 922258		. 707680		34	. 931123		. 764815	
		2. 48		15. 17			2. 43		16. 67
35	9. 922407		0. 708590		35	9. 931269		0. 765815	
		2. 48		15. 18			2. 45		16. 68
36	. 922556		. 709501		36	. 931416		. 766816	
		2. 48		15. 22			2. 43		16. 72
37	. 922705		. 710414		37	. 931562		. 767819	
		2. 48		15. 23			2. 43		16. 73
38	. 922854		. 711328		38	. 931708		. 768823	
		2. 48		15. 25			2. 45		16. 77
39	. 923003		. 712243		39	. 931855		. 769829	
		2. 48		15. 28			2. 43		16. 80
40	9. 923152		0. 713160		40	9. 932001		0. 770837	
		2. 48		15. 30			2. 43		16. 82
41	. 923301		. 714078		41	. 932147		. 771846	
		2. 47		15. 33			2. 43		16. 87
42	. 923449		. 714998		42	. 932293		. 772858	
		2. 48		15. 35			2. 43		16. 87
43	. 923598		. 715919		43	. 932439		. 773870	
		2. 48		15. 37			2. 43		16. 92
44	. 923747		. 716841		44	. 932585		. 774885	
		2. 47		15. 38			2. 43		16. 95
45	9. 923895		0. 717764		45	9. 932731		0. 775902	
		2. 48		15. 42			2. 43		16. 97
46	. 924044		. 718689		46	. 932877		. 776920	
		2. 47		15. 45			2. 43		17. 00
47	. 924192		. 719616		47	. 933023		. 777940	
		2. 48		15. 45			2. 43		17. 02
48	. 924341		. 720543		48	. 933169		. 778961	
		2. 47		15. 48			2. 43		17. 07
49	. 924489		. 721472		49	. 933315		. 779985	
		2. 47		15. 52			2. 42		17. 08
50	9. 924637		0. 722403		50	9. 933460		0. 781010	
		2. 48		15. 53			2. 43		17. 12
51	. 924786		. 723335		51	. 933606		. 782037	
		2. 47		15. 55			2. 43		17. 13
52	. 924934		. 724268		52	. 933752		. 783065	
		2. 47		15. 58			2. 42		17. 18
53	. 925082		. 725203		53	. 933897		. 784096	
		2. 48		15. 60			2. 43		17. 20
54	. 925231		. 726139		54	. 934043		. 785128	
		2. 47		15. 63			2. 43		17. 23
55	9. 925379		0. 727077		55	9. 934189		0. 786162	
		2. 47		15. 65			2. 42		17. 27
56	. 925527		. 728016		56	. 934334		. 787198	
		2. 47		15. 67			2. 43		17. 30
57	. 925675		. 728956		57	. 934480		. 788236	
		2. 47		15. 70			2. 42		17. 33
58	. 925823		. 729898		58	. 934625		. 789276	
		2. 47		15. 73			2. 42		17. 35
59	. 925971		. 730842		59	. 934770		. 790317	
		2. 47		15. 73			2. 43		17. 40
60	9. 926119		0. 731786		60	9. 934916		0. 791361	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

82°					83°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.934916		0.791361		0	9.943559		0.857665	
		2.42		17.42			2.38		19.55
1	.935061	2.42	.792406	17.45	1	.943702	2.38	.858838	19.58
2	.935206	2.43	.793453	17.48	2	.943845	2.37	.860013	19.63
3	.935352	2.42	.794502	17.50	3	.943987	2.38	.861191	19.67
4	.935497	2.42	.795552	17.55	4	.944130	2.38	.862371	19.72
5	9.935642	2.42	0.796605	17.58	5	9.944273	2.37	0.863554	19.75
6	.935787	2.42	.797660	17.60	6	.944415	2.38	.864739	19.80
7	.935932	2.42	.798716	17.63	7	.944558	2.37	.865927	19.83
8	.936077	2.42	.799774	17.68	8	.944700	2.38	.867117	19.88
9	.936222	2.42	.800835	17.70	9	.944843	2.37	.868310	19.92
10	9.936367		0.801897		10	9.944985		0.869505	
		2.42		17.73			2.37		19.97
11	.936512	2.42	.802961	17.77	11	.945127	2.38	.870703	20.00
12	.936657	2.40	.804027	17.80	12	.945270	2.37	.871903	20.05
13	.936801	2.42	.805095	17.83	13	.945412	2.37	.873106	20.10
14	.936946	2.42	.806165	17.87	14	.945554	2.37	.874312	20.13
15	9.937091	2.42	0.807237	17.90	15	9.945696	2.37	0.875520	20.18
16	.937236	2.40	.808311	17.93	16	.945838	2.38	.876731	20.23
17	.937380	2.42	.809387	17.97	17	.945981	2.37	.877945	20.27
18	.937525	2.40	.810465	18.00	18	.946123	2.37	.879161	20.30
19	.937669	2.42	.811545	18.03	19	.946265	2.37	.880379	20.37
20	9.937814		0.812627		20	9.946407		0.881601	
		2.40		18.07			2.37		20.40
21	.937958	2.42	.813711	18.10	21	.946549	2.35	.882825	20.45
22	.938103	2.40	.814797	18.13	22	.946690	2.37	.884052	20.48
23	.938247	2.40	.815885	18.17	23	.946832	2.37	.885281	20.55
24	.938391	2.42	.816975	18.20	24	.946974	2.37	.886514	20.58
25	9.938536	2.40	0.818067	18.23	25	9.947116	2.37	0.887749	20.62
26	.938680	2.40	.819161	18.27	26	.947258	2.35	.888986	20.68
27	.938824	2.40	.820257	18.32	27	.947399	2.37	.890227	20.72
28	.938968	2.40	.821356	18.33	28	.947541	2.37	.891470	20.77
29	.939112	2.42	.822456	18.38	29	.947683	2.35	.892716	20.82
30	9 939257		0.823559		30	9.947824		0.893965	
		2.40		18.42			2.37		20.87
31	.939401	2.40	.824664	18.43	31	.947966	2.35	.895217	20.92
32	.939545	2.38	.825770	18.48	32	.948107	2.37	.896472	20.95
33	.939688	2.40	.826879	18.52	33	.948249	2.35	.897729	21.00
34	.939832	2.40	.827990	18.57	34	.948390	2.35	.898989	21.07
35	9.939976	2.40	0.829104	18.58	35	9.948531	2.37	0.900253	21.10
36	.940120	2.40	.830219	18.63	36	.948673	2.35	.901519	21.15
37	.940264	2.40	.831337	18.65	37	.948814	2.35	.902788	21.20
38	.940408	2.38	.832456	18.70	38	.948955	2.35	.904060	21.25
39	.940551	2.40	.833578	18.75	39	.949096	2.35	.905335	21.30
40	9.940695		0.834703		40	9.949237		0.906613	
		2.40		18.77			2.37		21.33
41	.940839	2.38	.835829	18.80	41	.949379	2.35	.907893	21.40
42	.940982	2.40	.836957	18.85	42	.949520	2.35	.909177	21.45
43	.941126	2.38	.838088	18.88	43	.949661	2.35	.910464	21.50
44	.941269	2.40	.839221	18.93	44	.949802	2.35	.911754	21.55
45	9.941413	2.38	0.840357	18.95	45	9.949943	2.33	0.913047	21.60
46	.941556	2.38	.841494	19.00	46	.950083	2.35	.914343	21.65
47	.941699	2.40	.842634	19.03	47	.950224	2.35	.915642	21.70
48	.941843	2.38	.843776	19.08	48	.950365	2.35	.916944	21.75
49	.941986	2.38	.844921	19.12	49	.950506	2.35	.918249	21.82
50	9.942129		0.846068		50	9.950647		0.919558	
		2.38		19.15			2.33		21.85
51	.942272	2.38	.847217	19.18	51	.950787	2.35	.920869	21.92
52	.942415	2.40	.848368	19.23	52	.950928	2.35	.922184	21.97
53	.942559	2.38	.849522	19.27	53	.951069	2.35	.923502	22.02
54	.942702	2.38	.850678	19.30	54	.951209	2.33	.924823	22.07
55	9.942845	2.38	0.851836	19.35	55	9.951350	2.33	0.926147	22.13
56	942988	2.38	.852997	19.40	56	.951490	2.35	927475	22.17
57	.943131	2.37	.854161	19.42	57	.951631	2.33	.928805	22.23
58	.943273	2.38	.855326	19.47	58	.951771	2.33	.930139	22.30
59	.943416	2.38	.856494	19.52	59	.951911	2.35	.931477	22.33
60	9.943559		0.857665		60	9.952052		0.932817	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

84°					85°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9.952052	2.33	0.932817	22.40	0	9.960397	2.30	1.020101	26.40
1	.952192	2.33	.934161	22.45	1	.960535	2.28	.021685	26.48
2	.952332	2.35	.935508	22.52	2	.960672	2.30	.023274	26.57
3	.952473	2.33	.936859	22.57	3	.960810	2.30	.024868	26.65
4	.952613	2.33	.938213	22.62	4	.960948	2.30	.026467	26.73
5	9.952753	2.33	0.939570	22.68	5	9.961086	2.28	1.028071	26.80
6	.952893	2.33	.940931	22.75	6	.961223	2.30	.029679	26.90
7	.953033	2.33	.942296	22.78	7	.961361	2.28	.031293	26.98
8	.953173	2.33	.943663	22.85	8	.961498	2.30	.032912	27.07
9	.953313	2.33	.945034	22.92	9	.961636	2.28	.034536	27.13
10	9.953453	2.33	0.946409	22.97	10	9.961773	2.30	1.036164	27.23
11	.953593	2.32	.947787	23.03	11	.961911	2.28	.037798	27.33
12	.953732	2.33	.949169	23.08	12	.962048	2.30	.039438	27.40
13	.953872	2.33	.950554	23.15	13	.962186	2.28	.041082	27.50
14	.954012	2.33	.951943	23.22	14	.962323	2.28	.042732	27.58
15	9.954152	2.32	0.953336	23.27	15	9.962460	2.28	1.044387	27.67
16	.954291	2.33	.954732	23.33	16	.962597	2.30	.046047	27.77
17	.954431	2.33	.956132	23.38	17	.962735	2.28	.047713	27.85
18	.954571	2.32	.957535	23.45	18	.962872	2.28	.049384	27.93
19	.954710	2.33	.958942	23.52	19	.963009	2.28	.051060	28.03
20	9.954850	2.32	0.960353	23.57	20	9.963146	2.28	1.052742	28.13
21	.954989	2.33	.961767	23.65	21	.963283	2.28	.054430	28.22
22	.955129	2.32	.963186	23.70	22	.963420	2.28	.056123	28.30
23	.955268	2.32	.964608	23.77	23	.963557	2.28	.057821	28.40
24	.955407	2.33	.966034	23.82	24	.963694	2.28	.059525	28.50
25	9.955547	2.32	0.967463	23.90	25	9.963831	2.28	1.061235	28.60
26	.955686	2.32	.968897	23.95	26	.963968	2.27	.062951	28.68
27	.955825	2.32	.970334	24.02	27	.964104	2.28	.064672	28.78
28	.955964	2.32	.971775	24.10	28	.964241	2.28	.066399	28.88
29	.956103	2.33	.973221	24.15	29	.964378	2.28	.068132	28.98
30	9.956243	2.32	0.974670	24.22	30	9.964515	2.27	1.069871	29.08
31	.956382	2.32	.976123	24.28	31	.964651	2.28	.071616	29.18
32	.956521	2.32	.977580	24.35	32	.964788	2.27	.073367	29.28
33	.956660	2.32	.979041	24.42	33	.964924	2.28	.075124	29.38
34	.956799	2.30	.980506	24.48	34	.965061	2.27	.076887	29.48
35	9.956937	2.32	0.981975	24.55	35	9.965197	2.28	1.078656	29.58
36	.957076	2.32	.983448	24.63	36	.965334	2.27	.080431	29.68
37	.957215	2.32	.984926	24.68	37	.965470	2.28	.082212	29.80
38	.957354	2.32	.986407	24.77	38	.965607	2.27	.084000	29.90
39	.957493	2.30	.987893	24.83	39	.965743	2.27	.085794	30.00
40	9.957631	2.32	0.989383	24.90	40	9.965879	2.28	1.087594	30.12
41	.957770	2.32	.990877	24.97	41	.966016	2.27	.089401	30.22
42	.957909	2.30	.992375	25.03	42	.966152	2.27	.091214	30.32
43	.958047	2.32	.993877	25.12	43	.966288	2.27	.093033	30.43
44	.958186	2.30	.995384	25.18	44	.966424	2.27	.094859	30.55
45	9.958324	2.32	0.996895	25.27	45	9.966560	2.27	1.096692	30.67
46	.958463	2.30	.998411	25.33	46	.966696	2.27	.098532	30.77
47	.958601	2.30	.999931	25.40	47	.966832	2.27	.100378	30.87
48	.958739	2.32	1.001455	25.48	48	.966968	2.27	.102230	31.00
49	.958878	2.30	.002984	25.55	49	.967104	2.27	.104090	31.12
50	9.959016	2.30	1.004517	25.63	50	9.967240	2.27	1.105957	31.22
51	.959154	2.30	.006055	25.70	51	.967376	2.27	.107830	31.35
52	.959292	2.32	.007597	25.78	52	.967512	2.25	.109711	31.45
53	.959431	2.30	.009144	25.85	53	.967647	2.27	.111598	31.58
54	.959569	2.30	.010695	25.93	54	.967783	2.27	.113493	31.68
55	9.959707	2.30	1.012251	26.00	55	9.967919	2.25	1.115394	31.82
56	.959845	2.30	.013811	26.10	56	.968054	2.27	.117303	31.93
57	.959983	2.30	.015377	26.17	57	.968190	2.27	.119219	32.07
58	.960121	2.30	.016947	26.23	58	.968326	2.25	.121143	32.18
59	.960259	2.30	.018521	26.33	59	.968461	2.27	.123074	32.30
60	9.960397		1.020101		60	9.968597		1.125012	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

86°					87°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 968597	2. 25	1. 125012	32. 43	0	9. 976654	2. 23	1. 257854	42. 52
1	. 968732	2. 27	. 126958	32. 55	1	. 976788	2. 22	. 260405	42. 73
2	. 968868	2. 25	. 128911	32. 70	2	. 976921	2. 22	. 262969	42. 95
3	. 969003	2. 25	. 130873	32. 80	3	. 977054	2. 22	. 265546	43. 20
4	. 969138	2. 27	. 132841	32. 95	4	. 977187	2. 22	. 268138	43. 42
5	9. 969274	2. 25	1. 134818	33. 07	5	9. 977320	2. 20	1. 270743	43. 67
6	. 969409	2. 25	. 136802	33. 22	6	. 977452	2. 22	. 273363	43. 88
7	. 969544	2. 25	. 138795	33. 33	7	. 977585	2. 22	. 275996	44. 15
8	. 969679	2. 25	. 140795	33. 47	8	. 977718	2. 22	. 278645	44. 38
9	. 969814	2. 25	. 142803	33. 62	9	. 977851	2. 22	. 281308	44. 63
10	9. 969949	2. 25	1. 144820	33. 73	10	9. 977984	2. 20	1. 283986	44. 88
11	. 970084	2. 25	. 146844	33. 88	11	. 978116	2. 22	. 286679	45. 13
12	. 970219	2. 25	. 148877	34. 02	12	. 978249	2. 22	. 289387	45. 38
13	. 970354	2. 25	. 150918	34. 17	13	. 978382	2. 20	. 292110	45. 65
14	. 970489	2. 25	. 152968	34. 30	14	. 978514	2. 22	. 294849	45. 92
15	9. 970624	2. 25	1. 155026	34. 43	15	9. 978647	2. 20	1. 297604	46. 17
16	. 970759	2. 25	. 157092	34. 60	16	. 978779	2. 22	. 300374	46. 45
17	. 970894	2. 25	. 159168	34. 73	17	. 978912	2. 20	. 303161	46. 72
18	. 971029	2. 25	. 161252	34. 87	18	. 979044	2. 22	. 305964	47. 00
19	. 971164	2. 23	. 163344	35. 03	19	. 979177	2. 20	. 308784	47. 27
20	9. 971298	2. 25	1. 165446	35. 17	20	9. 979309	2. 22	1. 311620	47. 55
21	. 971433	2. 25	. 167556	35. 33	21	. 979442	2. 20	. 314473	47. 83
22	. 971568	2. 23	. 169676	35. 48	22	. 979574	2. 20	. 317343	48. 13
23	. 971702	2. 25	. 171805	35. 63	23	. 979706	2. 20	. 320231	48. 43
24	. 971837	2. 23	. 173943	35. 78	24	. 979838	2. 20	. 323137	48. 72
25	9. 971971	2. 25	1. 176090	35. 93	25	9. 979970	2. 22	1. 326060	49. 02
26	. 972106	2. 23	. 178246	36. 10	26	. 980103	2. 20	. 329001	49. 33
27	. 972240	2. 23	. 180412	36. 27	27	. 980235	2. 20	. 331961	49. 63
28	. 972374	2. 25	. 182588	36. 42	28	. 980367	2. 20	. 334939	49. 93
29	. 972509	2. 23	. 184773	36. 58	29	. 980499	2. 20	. 337935	50. 27
30	9. 972643	2. 23	1. 186968	36. 75	30	9. 980631	2. 20	1. 340951	50. 58
31	. 972777	2. 25	. 189173	36. 90	31	. 980763	2. 20	. 343986	50. 92
32	. 972912	2. 23	. 191387	37. 08	32	. 980895	2. 18	. 347041	51. 23
33	. 973046	2. 23	. 193612	37. 25	33	. 981026	2. 20	. 350115	51. 58
34	. 973180	2. 23	. 195847	37. 42	34	. 981158	2. 20	. 353210	51. 92
35	9. 973314	2. 23	1. 198092	37. 58	35	9. 981290	2. 20	1. 356325	52. 25
36	. 973448	2. 23	. 200347	37. 77	36	. 981422	2. 20	. 359466	52. 62
37	. 973582	2. 23	. 202613	37. 93	37	. 981554	2. 18	. 362617	52. 95
38	. 973716	2. 23	. 204889	38. 12	38	. 981685	2. 20	. 365794	53. 32
39	. 973850	2. 23	. 207176	38. 28	39	. 981817	2. 20	. 368993	53. 68
40	9. 973984	2. 23	1. 209473	38. 47	40	9. 981949	2. 18	1. 372214	54. 07
41	. 974118	2. 23	. 211781	38. 67	41	. 982080	2. 20	. 375458	54. 42
42	. 974252	2. 23	. 214101	38. 83	42	. 982212	2. 18	. 378723	54. 80
43	. 974386	2. 22	. 216431	39. 03	43	. 982343	2. 20	. 382011	55. 20
44	. 974519	2. 23	. 218773	39. 20	44	. 982475	2. 18	. 385323	55. 58
45	9. 974653	2. 23	1. 221125	39. 42	45	9. 982606	2. 18	1. 388658	55. 97
46	. 974787	2. 22	. 223490	39. 58	46	. 982737	2. 20	. 392016	56. 38
47	. 974920	2. 23	. 225865	39. 80	47	. 982869	2. 18	. 395399	56. 80
48	. 975054	2. 23	. 228253	39. 98	48	. 983000	2. 18	. 398807	57. 20
49	. 975188	2. 22	. 230652	40. 18	49	. 983131	2. 18	. 402239	57. 62
50	9. 975321	2. 23	1. 233063	40. 38	50	9. 983262	2. 20	1. 405696	58. 07
51	. 975455	2. 22	. 235486	40. 58	51	. 983394	2. 18	. 409180	58. 48
52	. 975588	2. 23	. 237921	40. 78	52	. 983525	2. 18	. 412689	58. 93
53	. 975722	2. 22	. 240368	41. 00	53	. 983656	2. 18	. 416225	59. 38
54	. 975855	2. 22	. 242828	41. 20	54	. 983787	2. 18	. 419788	59. 83
55	9. 975988	2. 23	1. 245300	41. 42	55	9. 983918	2. 18	1. 423378	60. 28
56	. 976122	2. 22	. 247785	41. 63	56	. 984049	2. 18	. 426995	60. 77
57	. 976255	2. 22	. 250283	41. 83	57	. 984180	2. 18	. 430641	61. 25
58	. 976388	2. 22	. 252793	42. 07	58	. 984311	2. 18	. 434316	61. 73
59	. 976521	2. 22	. 255317	42. 28	59	. 984442	2. 18	. 438020	62. 22
60	9. 976654		1. 257854		60	9. 984573		1. 441753	

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TABLE XXVII.—*Common logarithms of versed sines and external secants*—Con.

88°					89°				
M.	Vers.	D. 1″.	Exsec.	D. 1″.	M.	Vers.	D. 1″.	Exsec.	D. 1″.
0	9. 984573	2. 17	1. 441753	62. 73	0	9. 992354	2. 13	1. 750498	123. 78
1	. 984703	2. 18	. 445517	63. 23	1	. 992482	2. 15	. 757925	125. 87
2	. 984834	2. 18	. 449311	63. 77	2	. 992611	2. 13	. 765477	128. 02
3	. 984965	2. 18	. 453137	64. 28	3	. 992739	2. 15	. 773158	130. 25
4	. 985096	2. 17	. 456994	64. 82	4	. 992868	2. 13	. 780973	132. 55
5	9. 985226	2. 18	1. 460883	65. 37	5	9. 992996	2. 13	1. 788926	134. 93
6	. 985357	2. 17	. 464805	65. 93	6	. 993124	2. 15	. 797022	137. 43
7	. 985487	2. 18	. 468761	66. 50	7	. 993253	2. 13	. 805268	140. 00
8	. 985618	2. 17	. 472751	67. 07	8	. 993381	2. 13	. 813668	142. 68
9	. 985748	2. 18	. 476775	67. 65	9	. 993509	2. 13	. 822229	145. 45
10	9. 985879	2. 17	1. 480834	68. 25	10	9. 993637	2. 13	1. 830956	148. 37
11	. 986009	2. 18	. 484929	68. 87	11	. 993765	2. 15	. 839858	151. 37
12	. 986140	2. 17	. 489061	69. 48	12	. 993894	2. 13	. 848940	154. 52
13	. 986270	2. 17	. 493230	70. 12	13	. 994022	2. 13	. 858211	157. 80
14	. 986400	2. 18	. 497437	70. 77	14	. 994150	2. 13	. 867679	161. 20
15	9. 986531	2. 17	1. 501683	71. 42	15	9. 994278	2. 13	1. 877351	164. 80
16	. 986661	2. 17	. 505968	72. 08	16	. 994406	2. 13	. 887239	168. 52
17	. 986791	2. 17	. 510293	72. 77	17	. 994534	2. 13	. 897350	172. 45
18	. 986921	2. 17	. 514659	73. 45	18	. 994662	2. 12	. 907697	176. 55
19	. 987051	2. 17	. 519066	74. 17	19	. 994789	2. 13	. 918290	180. 85
20	9. 987181	2. 17	1. 523516	74. 90	20	9. 994917	2. 13	1. 929141	185. 38
21	. 987311	2. 17	. 528010	75. 63	21	. 995045	2. 13	. 940264	190. 13
22	. 987441	2. 17	. 532548	76. 38	22	. 995173	2. 13	. 951672	195. 15
23	. 987571	2. 17	. 537131	77. 15	23	. 995301	2. 12	. 963381	200. 45
24	. 987701	2. 17	. 541760	77. 95	24	. 995428	2. 13	. 975408	206. 02
25	9. 987831	2. 17	1. 546437	78. 73	25	9. 995556	2. 12	1. 987769	211. 93
26	. 987961	2. 17	. 551161	79. 57	26	. 995683	2. 13	2. 000485	218. 22
27	. 988091	2. 17	. 555935	80. 40	27	. 995811	2. 13	. 013578	224. 85
28	. 988221	2. 15	. 560759	81. 25	28	. 995939	2. 12	. 027069	231. 92
29	. 988350	2. 17	. 565634	82. 12	29	. 996066	2. 12	. 040984	239. 47
30	9. 988480	2. 17	1. 570561	83. 02	30	9. 996193	2. 13	2. 055352	247. 50
31	. 988610	2. 15	. 575542	83. 93	31	. 996321	2. 12	. 070202	256. 12
32	. 988739	2. 17	. 580578	84. 87	32	. 996448	2. 13	. 085569	265. 35
33	. 988869	2. 15	. 585670	85. 82	33	. 996576	2. 12	. 101490	275. 30
34	. 988998	2. 17	. 590819	86. 80	34	. 996703	2. 12	. 118008	286. 00
35	9. 989128	2. 15	1. 596027	87. 80	35	9. 996830	2. 12	2. 135168	297. 60
36	. 989257	2. 17	. 601295	88. 83	36	. 996957	2. 13	. 153024	310. 17
37	. 989387	2. 15	. 606625	89. 88	37	. 997085	2. 12	. 171634	323. 87
38	. 989516	2. 17	. 612018	90. 95	38	. 997212	2. 12	. 191066	338. 83
39	. 989646	2. 15	. 617475	92. 05	39	. 997339	2. 12	. 211396	355. 27
40	9. 989775	2. 15	1. 622998	93. 18	40	9. 997466	2. 12	2. 232712	373. 40
41	. 989904	2. 17	. 628589	94. 35	41	. 997593	2. 12	. 255116	393. 45
42	. 990034	2. 15	. 634250	95. 53	42	. 997720	2. 12	. 278723	415. 85
43	. 990163	2. 15	. 639982	96. 77	43	. 997847	2. 12	. 303674	440. 92
44	. 990292	2. 15	. 645788	98. 00	44	. 997974	2. 12	. 330129	469. 27
45	9. 990421	2. 15	1. 651668	99. 30	45	9. 998101	2. 12	2. 358285	501. 50
46	. 990550	2. 15	. 657626	100. 62	46	. 998228	2. 12	. 388375	538. 52
47	. 990679	2. 15	. 663663	101. 97	47	. 998355	2. 12	. 420686	581. 48
48	. 990808	2. 15	. 669781	103. 38	48	. 998481	2. 10	. 455575	631. 92
49	. 990937	2. 15	. 675984	104. 80	49	. 998608	2. 12	. 493490	691. 98
50	9. 991066	2. 15	1. 682272	106. 28	50	9. 998735	2. 12	2. 535009	764. 73
51	. 991195	2. 15	. 688649	107. 80	51	. 998862	2. 10	. 580893	854. 65
52	. 991324	2. 15	. 695117	109. 37	52	. 998988	2. 12	. 632172	968. 65
53	. 991453	2. 15	. 701679	110. 98	53	. 999115	2. 10	. 690291	1117. 88
54	. 991582	2. 13	. 708338	112. 65	54	. 999241	2. 12	. 757364	1321. 80
55	9. 991710	2. 15	1. 715097	114. 35	55	9. 999368	2. 10	2. 836672	1617. 27
56	. 991839	2. 15	. 721958	116. 12	56	. 999494	2. 12	. 933708	2084. 43
57	. 991968	2. 13	. 728925	117. 95	57	. 999621	2. 10	3. 058774	2936. 95
58	. 992096	2. 15	. 736002	119. 83	58	. 999747	2. 12	. 234991	5019. 28
59	. 992225	2. 15	. 743192	121. 77	59	. 999874	2. 10	. 536148	
60	9. 992354		1. 750498		60	0. 000000		∞	

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TABLE XXVIII

NATURAL VERSED SINES AND EXTERNAL SECANTS

M.	0°		1°		2°		3°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.00000	.00000	.00015	.00015	.00061	.00061	.00137	.00137	0
1	000	000	016	016	062	062	139	139	1
2	000	000	016	016	063	063	140	140	2
3	000	000	017	017	064	064	142	142	3
4	000	000	017	017	065	065	143	143	4
5	.00000	.00000	.00018	.00018	.00066	.00066	.00145	.00145	5
6	000	000	018	018	067	067	146	147	6
7	000	000	019	019	068	068	148	148	7
8	000	000	020	020	069	069	149	150	8
9	000	000	020	020	070	070	151	151	9
10	.00000	.00000	.00021	.00021	.00071	.00072	.00153	.00153	10
11	001	001	021	021	073	073	154	155	11
12	001	001	022	022	074	074	156	156	12
13	001	001	023	023	075	075	158	158	13
14	001	001	023	023	076	076	159	159	14
15	.00001	.00001	.00024	.00024	.00077	.00077	.00161	.00161	15
16	001	001	024	024	078	078	162	163	16
17	001	001	025	025	079	079	164	164	17
18	001	001	026	026	081	081	166	166	18
19	002	002	026	026	082	082	167	168	19
20	.00002	.00002	.00027	.00027	.00083	.00083	.00169	.00169	20
21	002	002	028	028	084	084	171	171	21
22	002	002	028	028	085	085	173	173	22
23	002	002	029	029	087	087	174	175	23
24	002	002	030	030	088	088	176	176	24
25	.00003	.00003	.00031	.00031	.00089	.00089	.00178	.00178	25
26	003	003	031	031	090	090	179	180	26
27	003	003	032	032	091	091	181	182	27
28	003	003	033	033	093	093	183	183	28
29	004	004	034	034	094	094	185	185	29
30	.00004	.00004	.00034	.00034	.00095	.00095	.00187	.00187	30
31	004	004	035	035	096	097	188	189	31
32	004	004	036	036	098	098	190	190	32
33	005	005	037	037	099	099	192	192	33
34	005	005	037	037	100	100	194	194	34
35	.00005	.00005	.00038	.00038	.00102	.00102	.00196	.00196	35
36	005	005	039	039	103	103	197	198	36
37	006	006	040	040	104	104	199	200	37
38	006	006	041	041	106	106	201	201	38
39	006	006	041	041	107	107	203	203	39
40	.00007	.00007	.00042	.00042	.00108	.00108	.00205	.00205	40
41	007	007	043	043	110	110	207	207	41
42	007	007	044	044	111	111	208	209	42
43	008	008	045	045	112	113	210	211	43
44	008	008	046	046	114	114	212	213	44
45	.00009	.00009	.00047	.00047	.00115	.00115	.00214	.00215	45
46	009	009	048	048	117	117	216	216	46
47	009	009	048	048	118	118	218	218	47
48	010	010	049	049	119	120	220	220	48
49	010	010	050	050	121	121	222	222	49
50	.00011	.00011	.00051	.00051	.00122	.00122	.00224	.00224	50
51	011	011	052	052	124	124	226	226	51
52	011	011	053	053	125	125	228	228	52
53	012	012	054	054	127	127	230	230	53
54	012	012	055	055	128	128	232	232	54
55	.00013	.00013	.00056	.00056	.00130	.00130	.00234	.00234	55
56	013	013	057	057	131	131	236	236	56
57	014	014	058	058	133	133	238	238	57
58	014	014	059	059	134	134	240	240	58
59	015	015	060	060	136	136	242	242	59
60	.00015	.00015	.00061	.00061	.00137	.00137	.00244	.00244	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	4°		5°		6°		7°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.00244	.00244	.00381	.00382	.00548	.00551	.00745	.00751	0
1	246	246	383	385	551	554	749	755	1
2	248	248	386	387	554	557	752	758	2
3	250	250	388	390	557	560	756	762	3
4	252	252	391	392	560	563	760	765	4
5	.00254	.00254	.00393	.00395	.00563	.00566	.00763	.00769	5
6	256	257	396	397	566	569	767	773	6
7	258	259	398	400	569	573	770	776	7
8	260	261	401	403	572	576	774	780	8
9	262	263	404	405	576	579	778	784	9
10	.00264	.00265	.00406	.00408	.00579	.00582	.00781	.00787	10
11	266	267	409	411	582	585	785	791	11
12	269	269	412	413	585	588	789	795	12
13	271	271	414	416	588	592	792	799	13
14	273	274	417	419	591	595	796	802	14
15	.00275	.00276	.00420	.00421	.00594	.00598	.00800	.00806	15
16	277	278	422	424	598	601	803	810	16
17	279	280	425	427	601	604	807	813	17
18	281	282	428	429	604	608	811	817	18
19	284	284	430	432	607	611	814	821	19
20	.00286	.00287	.00433	.00435	.00610	.00614	.00818	.00825	20
21	288	289	436	438	614	617	822	828	21
22	290	291	438	440	617	621	825	832	22
23	292	293	441	443	620	624	829	836	23
24	295	296	444	446	623	627	833	840	24
25	.00297	.00298	.00447	.00449	.00626	.00630	.00837	.00844	25
26	299	300	449	451	630	634	840	848	26
27	301	302	452	454	633	637	844	851	27
28	304	305	455	457	636	640	848	855	28
29	306	307	458	460	640	644	852	859	29
30	.00308	.00309	.00460	.00463	.00643	.00647	.00856	.00863	30
31	311	312	463	465	646	650	859	867	31
32	313	314	466	468	649	654	863	871	32
33	315	316	469	471	653	657	867	875	33
34	317	318	472	474	656	660	871	878	34
35	.00320	.00321	.00474	.00477	.00659	.00664	.00875	.00882	35
36	322	323	477	480	663	667	878	886	36
37	324	326	480	482	666	671	882	890	37
38	327	328	483	485	669	674	886	894	38
39	329	330	486	488	673	677	890	898	39
40	.00332	.00333	.00489	.00491	.00676	.00681	.00894	.00902	40
41	334	335	492	494	680	684	898	906	41
42	336	337	494	497	683	688	902	910	42
43	339	340	497	500	686	691	906	914	43
44	341	342	500	503	690	695	909	918	44
45	.00343	.00345	.00503	.00506	.00693	.00698	.00913	.00922	45
46	346	347	506	509	697	701	917	926	46
47	348	349	509	512	700	705	921	930	47
48	351	352	512	515	703	708	925	934	48
49	353	354	515	518	707	712	929	938	49
50	.00356	.00357	.00518	.00521	.00710	.00715	.00933	.00942	50
51	358	359	521	524	714	719	937	946	51
52	361	362	524	527	717	722	941	950	52
53	363	364	527	530	721	726	945	954	53
54	365	367	530	533	724	730	949	958	54
55	.00368	.00369	.00533	.00536	.00728	.00733	.00953	.00962	55
56	370	372	536	539	731	737	957	966	56
57	373	374	539	542	735	740	961	970	57
58	375	377	542	545	738	744	965	975	58
59	378	379	545	548	742	747	969	979	59
60	.00381	.00382	.00548	.00551	.00745	.00751	.00973	.00983	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	8°		9°		10°		11°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.00973	.00983	.01231	.01247	.01519	.01543	.01837	.01872	0
1	977	987	236	251	524	548	843	877	1
2	981	991	240	256	529	553	848	883	2
3	985	995	245	261	534	558	854	889	3
4	989	999	249	265	539	564	860	895	4
5	.00994	.01004	.01254	.01270	.01545	.01569	.01865	.01901	5
6	998	008	259	275	550	574	871	906	6
7	.01002	012	263	279	555	579	876	912	7
8	006	016	268	284	560	585	882	918	8
9	010	020	272	289	565	590	888	924	9
10	.01014	.01024	.01277	.01294	.01570	.01595	.01893	.01930	10
11	018	029	282	298	575	601	899	936	11
12	022	033	286	303	580	606	904	941	12
13	027	037	291	308	586	611	910	947	13
14	031	041	296	313	591	616	916	953	14
15	.01035	.01046	.01300	.01317	.01596	.01622	.01921	.01959	15
16	039	050	305	322	601	627	927	565	16
17	043	054	310	327	606	633	933	971	17
18	047	059	314	332	611	638	939	977	18
19	052	063	319	337	617	643	944	983	19
20	.01056	.01067	.01324	.01342	.01622	.01649	.01950	.01989	20
21	060	071	329	346	627	654	956	995	21
22	064	076	333	351	632	659	961	.02001	22
23	069	080	338	356	638	665	967	007	23
24	073	084	343	361	643	670	973	013	24
25	.01077	.01089	.01348	.01366	.01648	.01676	.01979	.02019	25
26	081	093	352	371	653	681	984	025	26
27	086	097	357	376	659	687	990	031	27
28	090	102	362	381	664	692	996	037	28
29	094	106	367	386	669	698	.02002	043	29
30	.01098	.01111	.01371	.01391	.01675	.01703	.02008	.02049	30
31	103	115	376	395	680	709	013	055	31
32	107	119	381	400	685	714	019	061	32
33	111	124	386	405	690	720	025	067	33
34	116	128	391	410	696	725	031	073	34
35	.01120	.01133	.01396	.01415	.01701	.01731	.02037	.02079	35
36	124	137	400	420	706	736	042	085	36
37	129	142	405	425	712	742	048	091	37
38	133	146	410	430	717	747	054	097	38
39	137	151	415	435	723	753	060	103	39
40	.01142	.01155	.01420	.01440	.01728	.01758	.02066	.02110	40
41	146	160	425	445	733	764	072	116	41
42	151	164	430	450	739	769	078	122	42
43	155	169	435	455	744	775	084	128	43
44	159	173	439	460	750	781	090	134	44
45	.01164	.01178	.01444	.01466	.01755	.01786	.02095	.02140	45
46	168	182	449	471	760	792	101	146	46
47	173	187	454	476	766	798	107	153	47
48	177	191	459	481	771	803	113	159	48
49	182	196	464	486	777	809	119	165	49
50	.01186	.01200	.01469	.01491	.01782	.01815	.02125	.02171	50
51	191	205	474	496	788	820	131	178	51
52	195	209	479	501	793	826	137	184	52
53	200	214	484	506	799	832	143	190	53
54	204	219	489	512	804	837	149	196	54
55	.01209	.01223	.10494	.01517	.01810	.01843	.02155	.02203	55
56	213	228	499	522	815	849	161	209	56
57	218	233	504	527	821	854	167	215	57
58	222	237	509	532	726	860	173	221	58
59	227	242	514	537	832	866	179	228	59
60	.01231	.01247	.01519	.01543	.01837	.01872	.02185	.02234	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continu

M.	12°		13°		14°		15°	
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.
0	.02185	.02234	.02563	.02630	.02970	.03061	.03407	.03528
1	191	240	570	637	977	069	415	536
2	197	247	576	644	985	076	422	544
3	203	253	583	651	992	084	430	552
4	209	259	589	658	999	091	438	560
5	.02216	.02266	.02596	.02665	.03006	.03099	.03445	.03568
6	222	272	602	672	013	106	453	576
7	228	279	609	679	020	114	460	584
8	234	285	616	686	027	121	468	592
9	240	291	622	693	034	129	476	601
10	.02246	.02298	.02629	.02700	.03041	.03137	.03483	.03609
11	252	304	635	707	048	144	491	617
12	258	311	642	714	055	152	498	625
13	265	317	649	721	063	159	506	633
14	271	323	655	728	070	167	514	642
15	.02277	.02330	.02662	.02735	.03077	.03175	.03521	.03650
16	283	336	669	742	084	182	529	658
17	289	343	675	749	091	190	537	666
18	295	349	682	756	098	197	544	674
19	302	356	689	763	106	205	552	683
20	.02308	.02362	.02696	.02770	.03113	.03213	.03560	.03691
21	314	369	702	777	120	220	567	699
22	320	375	709	784	127	228	575	708
23	327	382	716	791	134	236	583	716
24	333	388	722	799	142	244	590	724
25	.02339	.02395	.02729	.02806	.03149	.03251	.03598	.03732
26	345	402	736	813	156	259	606	741
27	352	408	743	820	163	267	614	749
28	358	415	749	827	171	275	621	758
29	364	421	756	834	178	282	629	766
30	.02370	.02428	.02763	.02842	.03185	.03290	.03637	.03774
31	377	435	770	849	193	298	645	783
32	383	441	777	856	200	306	653	791
33	389	448	783	863	207	313	660	799
34	396	454	790	870	214	321	668	808
35	.02402	.02461	.02797	.02878	.03222	.03329	.03676	.03816
36	408	468	804	885	229	337	684	825
37	415	474	811	892	236	345	692	833
38	421	481	818	899	244	353	699	842
39	427	488	824	907	251	360	707	850
40	.02434	.02494	.02831	.02914	.03258	.03368	.03715	.03858
41	440	501	838	921	266	376	723	867
42	447	508	845	928	273	384	731	875
43	453	515	852	936	281	392	739	884
44	459	521	859	943	288	400	747	892
45	.02466	.02528	.02866	.02950	.03295	.03408	.03754	.03901
46	472	535	873	958	303	416	762	909
47	479	542	880	965	310	424	770	918
48	485	548	887	972	318	432	778	927
49	492	555	894	980	325	439	786	935
50	.02498	.02562	.02900	.02987	.03333	.03447	.03794	.03944
51	504	569	907	994	340	455	802	952
52	511	576	914	.03002	347	463	810	961
53	517	582	921	009	355	471	818	969
54	524	589	928	017	362	479	826	978
55	.02530	.02596	.02935	.03024	.03370	.03487	.03834	.03987
56	537	603	942	032	377	495	842	995
57	543	610	949	039	385	503	850	.04004
58	550	617	956	046	392	511	858	013
59	556	624	963	054	400	520	866	021
60	.02563	.02630	.02970	.03061	.03407	.03528	.03874	.04030

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	16°		17°		18°		19°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.03874	.04030	.04370	.04569	.04894	.05146	.05448	.05762	0
1	882	039	378	578	903	156	458	773	1
2	890	047	387	588	912	166	467	783	2
3	898	056	395	597	921	176	477	794	3
4	906	065	404	606	930	186	486	805	4
5	.03914	.04073	.04412	.04616	.04939	.05196	.05496	.05815	5
6	922	082	421	625	948	206	505	826	6
7	930	091	429	635	957	216	515	836	7
8	938	100	438	644	967	226	524	847	8
9	946	108	446	653	976	236	534	858	9
10	.03954	.04117	.04455	.04663	.04985	.05246	.05543	.05869	10
11	963	126	464	672	994	256	553	879	11
12	971	135	472	682	.05003	266	562	890	12
13	979	144	481	691	012	276	572	901	13
14	987	152	489	700	021	286	582	911	14
15	.03995	.04161	.04498	.04710	.05030	.05297	.05591	.05922	15
16	.04003	170	507	719	039	307	601	933	16
17	011	179	515	729	048	317	610	944	17
18	019	188	524	738	057	327	620	955	18
19	028	197	533	748	067	337	630	965	19
20	.04030	.04206	.04541	.04757	.05076	.05347	.05639	.05976	20
21	044	214	550	767	085	357	649	987	21
22	052	223	559	776	094	367	658	998	22
23	060	232	567	786	103	378	668	.06009	23
24	069	241	576	795	112	388	678	020	24
25	.04077	.04250	.04585	.04805	.05122	.05398	.05687	.06030	25
26	085	259	593	815	131	408	697	041	26
27	093	268	602	824	140	418	707	052	27
28	102	277	611	834	149	429	716	063	28
29	110	286	620	843	158	439	726	074	29
30	.04118	.04295	.04628	.04853	.05168	.05449	.05736	.06085	30
31	126	304	637	863	177	460	746	096	31
32	135	313	646	872	186	470	755	107	32
33	143	322	655	882	195	480	765	118	33
34	151	331	663	891	205	490	775	129	34
35	.04159	.04340	.04672	.04901	.05214	.05501	.05785	.06140	35
36	168	349	681	911	223	511	794	151	36
37	176	358	690	920	232	521	804	162	37
38	184	367	699	930	242	532	814	173	38
39	193	376	707	940	251	542	824	184	39
40	.04201	.04385	.04716	.04950	.05260	.05552	.05833	.06195	40
41	209	394	725	959	270	563	843	206	41
42	218	403	734	969	279	573	853	217	42
43	226	413	743	979	288	584	863	228	43
44	234	422	752	989	298	594	873	239	44
45	.04243	.04431	.04760	.04998	.05307	.05604	.05882	.06250	45
46	251	440	769	.05008	316	615	892	261	46
47	260	449	778	018	326	625	902	272	47
48	268	458	787	028	335	636	912	283	48
49	276	468	796	038	344	646	922	295	49
50	.04285	.04477	.04805	.05047	.05354	.05657	.05932	.06306	50
51	293	486	814	057	363	667	942	317	51
52	302	495	823	067	373	678	951	328	52
53	310	504	832	077	382	688	961	339	53
54	319	514	841	087	391	699	971	350	54
55	.04327	.04523	.04850	.05097	.05401	.05709	.05981	.06362	55
56	336	532	858	107	410	720	991	373	56
57	344	541	867	116	420	730	.06001	384	57
58	353	551	876	126	429	741	011	395	58
59	361	560	885	136	439	751	021	407	59
60	.04370	.04569	.04894	.05146	.05448	.05762	.06031	.06418	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	20°		21°		22°		23°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.06031	.06418	.06642	.07114	.07282	.07853	.07950	.08636	0
1	041	429	652	126	293	866	961	649	1
2	051	440	663	138	303	879	972	663	2
3	061	452	673	150	314	892	984	676	3
4	071	463	684	162	325	904	995	690	4
5	.06081	.06474	.06694	.07174	.07336	.07917	.08006	.08703	5
6	091	486	705	186	347	930	018	717	6
7	101	497	715	199	358	943	029	730	7
8	111	508	726	211	369	955	041	744	8
9	121	520	736	223	380	968	052	757	9
10	.06131	.06531	.06747	.07235	.07391	.07981	.08064	.08771	10
11	141	542	757	247	402	994	075	784	11
12	151	554	768	259	413	.08006	086	798	12
13	161	565	778	271	424	019	098	811	13
14	171	577	789	283	435	032	109	825	14
15	.06181	.06588	.06799	.07295	.07446	.08045	.08121	.08839	15
16	191	600	810	307	457	058	132	852	16
17	201	611	820	320	468	071	144	866	17
18	211	622	831	332	479	084	155	880	18
19	221	634	841	344	490	097	167	893	19
20	.06231	.06645	.06852	.07356	.07501	.08109	.08178	.08907	20
21	241	657	863	368	512	122	190	920	21
22	252	668	873	380	523	135	201	934	22
23	262	680	884	393	534	148	213	948	23
24	272	691	894	405	545	161	225	962	24
25	.06282	.06703	.06905	.07417	.07556	.08174	.08236	.08975	25
26	292	715	916	429	568	187	248	989	26
27	302	726	926	442	579	200	259	.09003	27
28	312	738	937	454	590	213	271	017	28
29	323	749	948	466	601	226	282	030	29
30	.06333	.06761	.06958	.07479	.07612	.08239	.08294	.09044	30
31	343	773	969	491	623	252	306	058	31
32	353	784	980	503	634	265	317	072	32
33	363	796	990	516	645	278	329	086	33
34	374	807	.07001	528	657	291	340	099	34
35	.06384	.06819	.07012	.07540	.07668	.08305	.08352	.09113	35
36	394	831	022	553	679	318	364	127	36
37	404	842	033	565	690	331	375	141	37
38	415	854	044	578	701	344	387	155	38
39	425	866	055	590	713	357	399	169	39
40	.06435	.06878	.07065	.07602	.07724	.08370	.08410	.09183	40
41	445	889	076	615	735	383	422	197	41
42	456	901	087	627	746	397	434	211	42
43	466	913	098	640	757	410	445	224	43
44	476	925	108	652	769	423	457	238	44
45	.06486	.06936	.07119	.07665	.07780	.08436	.08469	.09252	45
46	497	948	130	677	791	449	481	266	46
47	507	960	141	690	802	463	492	280	47
48	517	972	151	702	814	476	504	294	48
49	528	984	162	715	825	489	516	308	49
50	.06538	.06995	.07173	.07727	.07836	.08503	.08528	.09323	50
51	548	.07007	184	740	848	516	539	337	51
52	559	019	195	752	859	529	551	351	52
53	569	031	206	765	870	542	563	365	53
54	580	043	216	778	881	556	575	379	54
55	.06590	.07055	.07227	.07790	.07893	.08569	.08586	.09393	55
56	600	067	238	803	904	582	598	407	56
57	611	079	249	816	915	596	610	421	57
58	621	091	260	828	927	609	622	435	58
59	632	103	271	841	938	623	634	449	59
60	.06642	.07114	.07282	.07853	.07950	.08636	.08645	.09464	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	24°		25°		26°		27°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.08645	.09464	.09369	.10338	.10121	.11260	.10899	.12233	0
1	657	478	382	353	133	276	913	249	1
2	669	492	394	368	146	292	926	266	2
3	681	506	406	383	159	308	939	283	3
4	693	520	418	398	172	323	952	299	4
5	.08705	.09535	.09431	.10413	.10184	.11339	.10965	.12316	5
6	717	549	443	428	197	355	979	333	6
7	728	563	455	443	210	371	992	349	7
8	740	577	468	458	223	387	.11005	366	8
9	752	592	480	473	236	403	019	383	9
10	.08764	.09606	.09493	.10488	.10248	.11419	.11032	.12400	10
11	776	620	505	503	261	435	045	416	11
12	788	635	517	518	274	451	058	433	12
13	800	649	530	533	287	467	072	450	13
14	812	663	542	549	300	483	085	467	14
15	.08824	.09678	.09554	.10564	.10313	.11499	.11098	.12484	15
16	836	692	567	579	326	515	112	501	16
17	848	707	579	594	338	531	125	518	17
18	860	721	592	609	351	547	138	534	18
19	872	735	604	625	364	563	152	551	19
20	.08884	.09750	.09617	.10640	.10377	.11579	.11165	.12568	20
21	896	764	629	655	390	595	178	585	21
22	908	779	642	670	403	611	192	602	22
23	920	793	654	686	416	627	205	619	23
24	932	808	666	701	429	643	218	636	24
25	.08944	.09822	.09679	.10716	.10442	.11659	.11232	.12653	25
26	956	837	691	731	455	675	245	670	26
27	968	851	704	747	468	691	259	687	27
28	980	866	716	762	481	708	272	704	28
29	992	880	729	777	494	724	285	721	29
30	.09004	.09895	.09741	.10793	.10507	.11740	.11299	.12738	30
31	016	909	754	808	520	756	312	755	31
32	028	924	767	824	533	772	326	772	32
33	040	939	779	839	546	789	339	789	33
34	052	953	792	854	559	805	353	807	34
35	.09064	.09968	.09804	.10870	.10572	.11821	.11366	.12824	35
36	076	982	817	885	585	838	380	841	36
37	089	997	829	901	598	854	393	858	37
38	101	.10012	842	916	611	870	407	875	38
39	113	026	854	932	624	886	420	892	39
40	.09125	.10041	.09867	.10947	.10637	.11903	.11434	.12910	40
41	137	056	880	963	650	919	447	927	41
42	149	071	892	978	663	936	461	944	42
43	161	085	905	994	676	952	474	961	43
44	174	100	918	.11009	689	968	488	979	44
45	.09186	.10115	.09930	.11025	.10702	.11985	.11501	.12996	45
46	198	130	943	041	715	.12001	515	.13013	46
47	210	144	955	056	728	018	528	031	47
48	222	159	968	072	741	034	542	048	48
49	234	174	981	087	755	051	555	065	49
50	.09247	.10189	.09993	.11103	.10768	.12067	.11569	.13083	50
51	259	204	.10006	119	781	083	583	100	51
52	271	218	019	134	794	100	596	117	52
53	283	233	032	150	807	117	610	135	53
54	296	248	044	166	820	133	623	152	54
55	.09308	.10263	.10057	.11181	.10833	.12150	.11637	.13170	55
56	320	278	070	197	847	166	651	187	56
57	332	293	082	213	860	183	664	205	57
58	345	308	095	229	873	199	678	222	58
59	357	323	108	244	886	216	692	239	59
60	.09369	.10338	.10121	.11260	.10899	.12233	.11705	.13257	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	28°		29°		30°		31°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.11705	.13257	.12538	.14335	.13397	.15470	.14283	.16663	0
1	719	275	552	354	412	489	298	684	1
2	733	292	566	372	427	509	313	704	2
3	746	310	580	391	441	528	328	725	3
4	760	327	594	409	456	548	343	745	4
5	.11774	.13345	.12609	.14428	.13470	.15567	.14358	.16766	5
6	787	362	623	446	485	587	373	786	6
7	801	380	637	465	499	606	388	806	7
8	815	398	651	483	514	626	403	827	8
9	828	415	665	502	529	645	418	848	9
10	.11842	.13432	.12679	.14521	.13543	.15665	.14433	.16868	10
11	856	451	694	539	558	684	449	889	11
12	870	468	708	558	573	704	464	909	12
13	883	486	722	576	587	724	479	930	13
14	897	504	736	595	602	743	494	950	14
15	.11911	.13521	.12750	.14614	.13616	.15763	.14509	.16971	15
16	925	539	765	632	631	782	524	992	16
17	938	557	779	651	646	802	539	.17012	17
18	952	575	793	670	660	822	554	033	18
19	966	593	807	689	675	841	569	054	19
20	.11980	.13610	.12822	.14707	.13690	.15861	.14584	.17075	20
21	994	628	836	726	705	881	599	095	21
22	.12007	646	850	745	719	901	615	116	22
23	021	664	864	764	734	920	630	137	23
24	035	682	879	782	749	940	645	158	24
25	.12049	.13700	.12893	.14801	.13763	.15960	.14660	.17178	25
26	063	718	907	820	778	980	675	199	26
27	077	735	921	839	793	.16000	690	220	27
28	091	753	936	858	808	019	706	241	28
29	104	771	950	877	822	039	721	262	29
30	.12118	.13789	.12964	.14896	.13837	.16059	.14736	.17283	30
31	132	807	979	914	852	079	751	304	31
32	146	825	993	933	867	099	766	325	32
33	160	843	.13007	952	881	119	782	346	33
34	174	861	022	971	896	139	797	367	34
35	.12188	.13879	.13036	.14990	.13911	.16159	.14812	.17388	35
36	202	897	051	.15009	926	179	827	409	36
37	216	915	065	028	941	199	843	430	37
38	230	934	079	047	955	219	858	451	38
39	244	952	094	066	970	239	873	472	39
40	.12257	.13970	.13108	.15085	.13985	.16259	.14888	.17493	40
41	271	988	122	105	.14000	279	904	514	41
42	285	.14006	137	124	015	299	919	535	42
43	299	024	151	143	030	319	934	556	43
44	313	042	166	162	044	339	949	577	44
45	.12327	.14061	.13180	.15181	.14059	.16359	.14965	.17598	45
46	341	079	195	200	074	380	980	620	46
47	355	097	209	219	089	400	995	641	47
48	369	115	223	239	104	420	.15011	662	48
49	383	134	238	258	119	440	026	683	49
50	.12397	.14152	.13252	.15277	.14134	.16460	.15041	.17704	50
51	411	170	267	296	149	481	057	726	51
52	425	188	281	315	164	501	072	747	52
53	439	207	296	335	179	521	087	768	53
54	454	225	310	354	194	541	103	790	54
55	.12468	.14243	.13325	.15373	.14208	.16562	.15118	.17811	55
56	482	262	339	393	223	582	134	832	56
57	496	280	354	412	238	602	149	854	57
58	510	299	368	431	253	623	164	875	58
59	524	317	383	451	268	643	180	896	59
60	.12538	.14335	.13397	.15470	.14283	.16663	.15195	.17918	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	32°		33°		34°		35°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.15195	.17918	.16133	.19236	.17096	.20622	.18085	.22077	0
1	211	939	149	259	113	645	101	102	1
2	226	961	165	281	129	669	118	127	2
3	241	982	181	304	145	693	135	152	3
4	257	.18004	196	327	161	717	152	177	4
5	.15272	.18025	.16212	.19349	.17178	.20740	.18168	.22202	5
6	288	047	228	372	194	764	185	227	6
7	303	068	244	394	210	788	202	252	7
8	319	090	260	417	227	812	218	277	8
9	334	111	276	440	243	836	235	302	9
10	.15350	.18133	.16292	.19463	.17259	.20859	.18252	.22327	10
11	365	155	308	485	276	883	269	352	11
12	381	176	324	508	292	907	286	377	12
13	396	198	340	531	308	931	302	402	13
14	412	220	355	553	325	955	319	428	14
15	.15427	.18241	.16371	.19576	.17341	.20979	.18336	.22453	15
16	443	263	387	599	357	.21003	353	478	16
17	458	285	403	622	374	027	369	503	17
18	474	307	419	645	390	051	386	528	18
19	489	328	435	668	407	075	403	554	19
20	.15505	.18350	.16451	.19691	.17423	.21099	.18420	.22579	20
21	520	372	467	713	439	123	437	604	21
22	536	394	483	736	456	147	454	629	22
23	552	416	499	759	472	171	470	655	23
24	567	437	515	782	489	195	487	680	24
25	.15583	.18459	.16531	.19805	.17505	.21220	.18504	.22706	25
26	598	481	547	828	522	244	521	731	26
27	614	503	563	851	538	268	538	756	27
28	630	525	579	874	554	292	555	782	28
29	645	547	595	897	571	316	572	807	29
30	.15661	.18569	.16611	.19920	.17587	.21341	.18588	.22833	30
31	676	591	627	944	604	365	605	858	31
32	692	613	644	967	620	389	622	884	32
33	708	635	660	990	637	414	639	909	33
34	723	657	676	.20013	653	438	656	935	34
35	.15739	.18679	.16692	.20036	.17670	.21462	.18673	.22960	35
36	755	701	708	059	686	487	690	986	36
37	770	723	724	083	703	511	707	.23012	37
38	786	745	740	106	719	535	724	037	38
39	802	767	756	129	736	560	741	063	39
40	.15818	.18790	.16772	.20152	.17752	.21584	.18758	.23089	40
41	833	812	788	176	769	609	775	114	41
42	849	834	805	199	786	633	792	140	42
43	865	856	821	222	802	658	809	166	43
44	880	878	837	246	819	682	826	192	44
45	.15896	.18901	.16853	.20269	.17835	.21707	.18843	.23217	45
46	912	923	869	292	852	731	860	243	46
47	928	945	885	316	868	756	877	269	47
48	943	967	902	339	885	781	894	295	48
49	959	990	918	363	902	805	911	321	49
50	.15975	.19012	.16934	.20386	.17918	.21830	.18928	.23347	50
51	991	034	950	410	935	855	945	373	51
52	.16006	057	966	433	952	879	962	398	52
53	022	079	983	457	968	904	979	424	53
54	038	102	999	480	985	929	996	450	54
55	.16054	.19124	.17015	.20504	.18001	.21953	.19013	.23476	55
56	070	146	031	527	018	978	030	502	56
57	085	169	047	551	035	.22003	047	529	57
58	101	191	064	575	051	028	064	555	58
59	117	214	080	598	068	053	081	581	59
60	.16133	.19236	.17096	.20622	.18085	.22077	.19098	.23607	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	36°		37°		38°		39°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.19098	.23607	.20136	.25214	.21199	.26902	.22285	.28676	0
1	115	633	154	241	217	931	304	706	1
2	133	659	171	269	235	960	322	737	2
3	150	685	189	296	253	988	340	767	3
4	167	711	207	324	271	.27017	359	797	4
5	.19184	.23738	.20224	.25351	.21289	.27046	.22377	.28828	5
6	201	764	242	379	306	075	395	858	6
7	218	790	259	406	324	104	414	889	7
8	235	816	277	434	342	133	432	919	8
9	252	843	294	462	360	162	450	950	9
10	.19270	.23869	.20312	.25489	.21378	.27191	.22469	.28980	10
11	287	895	329	517	396	221	487	.29011	11
12	304	922	347	545	414	250	506	042	12
13	321	948	365	572	432	279	524	072	13
14	338	975	382	600	450	308	542	103	14
15	.19356	.24001	.20400	.25628	.21468	.27337	.22561	.29133	15
16	373	028	417	656	486	366	579	164	16
17	390	054	435	683	504	396	598	195	17
18	407	081	453	711	522	425	616	226	18
19	424	107	470	739	540	454	634	256	19
20	.19442	.24134	.20488	.25767	.21558	.27483	.22653	.29287	20
21	459	160	506	795	576	513	671	318	21
22	476	187	523	823	595	542	690	349	22
23	493	213	541	851	613	572	708	380	23
24	511	240	559	879	631	601	727	411	24
25	.19528	.24267	.20576	.25907	.21649	.27630	.22745	.29442	25
26	545	293	594	935	667	660	764	473	26
27	562	320	612	963	685	689	782	504	27
28	580	347	629	991	703	719	801	535	28
29	597	373	647	.26019	721	748	819	566	29
30	.19614	.24400	.20665	.26047	.21739	.27778	.22838	.29597	30
31	632	427	682	075	757	807	856	628	31
32	649	454	700	104	775	837	875	659	32
33	666	481	718	132	794	867	893	690	33
34	684	508	736	160	812	896	912	721	34
35	.19701	.24534	.20753	.26188	.21830	.27926	.22930	.29752	35
36	718	561	771	216	848	956	949	784	36
37	736	588	789	245	866	985	967	815	37
38	753	615	807	273	884	.28015	986	846	38
39	770	642	824	301	902	045	.23004	877	39
40	.19788	.24669	.20842	.26330	.21921	.28075	.23023	.29909	40
41	805	696	860	358	939	105	041	940	41
42	822	723	878	387	957	134	060	971	42
43	840	750	895	415	975	164	079	.30003	43
44	857	777	913	443	993	194	097	034	44
45	.19875	.24804	.20931	.26472	.22012	.28224	.23116	.30066	45
46	892	832	949	500	030	254	134	097	46
47	909	859	967	529	048	284	153	129	47
48	927	886	984	557	066	314	172	160	48
49	944	913	.21002	586	084	344	190	192	49
50	.19962	.24940	.21020	.26615	.22103	.28374	.23209	.30223	50
51	979	967	038	643	121	404	228	255	51
52	997	995	056	672	139	434	246	287	52
53	.20014	.25022	074	701	157	464	265	318	53
54	032	049	092	729	176	495	283	350	54
55	.20049	.25077	.21109	.26758	.22194	.28525	.23302	.30382	55
56	066	104	127	787	212	555	321	413	56
57	084	131	145	815	231	585	339	445	57
58	101	159	163	844	249	615	358	477	58
59	119	186	181	873	267	646	377	509	59
60	.20136	.25214	.21199	.26902	.22285	.28676	.23396	.30541	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	40°		41°		42°		43°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.23396	.30541	.24529	.32501	.25686	.34563	.26865	.36733	0
1	414	573	548	535	705	599	884	770	1
2	433	605	567	568	724	634	904	807	2
3	452	636	586	602	744	669	924	844	3
4	470	668	605	636	763	704	944	881	4
5	.23489	.30700	.24625	.32669	.25783	.34740	.26964	.36919	5
6	508	732	644	703	802	775	984	956	6
7	527	764	663	737	822	811	.27004	993	7
8	545	796	682	770	841	846	024	.37030	8
9	564	829	701	804	861	882	043	068	9
10	.23583	.30861	.24720	.32838	.25880	.34917	.27063	.37105	10
11	602	893	739	872	900	953	083	143	11
12	620	925	759	905	920	988	103	180	12
13	639	957	778	939	939	.35024	123	218	13
14	658	989	797	973	959	060	143	255	14
15	.23677	.31022	.24816	.33007	.25978	.35095	.27163	.37293	15
16	696	054	835	041	998	131	183	330	16
17	714	086	854	075	.26017	167	203	368	17
18	733	119	874	109	037	203	223	406	18
19	752	151	893	143	056	238	243	443	19
20	.23771	.31183	.24912	.33177	.26076	.35274	.27263	.37481	20
21	790	216	931	211	096	310	283	519	21
22	808	248	950	245	115	346	303	556	22
23	827	281	970	279	135	382	323	594	23
24	846	313	989	314	154	418	343	632	24
25	.23865	.31346	.25008	.33348	.26174	.35454	.27363	.37670	25
26	884	378	027	382	194	490	383	708	26
27	903	411	047	416	213	526	403	746	27
28	922	443	066	451	233	562	423	784	28
29	941	476	085	485	253	598	443	822	29
30	.23959	.31509	.25104	.33519	.26272	.35634	.27463	.37860	30
31	978	541	124	554	292	670	483	898	31
32	997	574	143	588	312	707	503	936	32
33	.24016	607	162	622	331	743	523	974	33
34	035	640	182	657	351	779	543	.38012	34
35	.24054	.31672	.25201	.33691	.26371	.35815	.27563	.38051	35
36	073	705	220	726	390	852	583	089	36
37	092	738	240	760	410	888	603	127	37
38	111	771	259	795	430	924	623	165	38
39	130	804	278	830	449	961	643	204	39
40	.24149	.31837	.25297	.33864	.26469	.35997	.27663	.38242	40
41	168	870	317	899	489	.36034	683	280	41
42	187	903	336	934	509	070	703	319	42
43	206	936	356	968	528	107	723	357	43
44	225	969	375	.34003	548	143	743	396	44
45	.24244	.32002	.25394	.34038	.26568	.36180	.27764	.38434	45
46	262	035	414	073	587	217	784	473	46
47	281	068	433	108	607	253	804	512	47
48	300	101	452	142	627	290	824	550	48
49	320	134	472	177	647	327	844	589	49
50	.24339	.32168	.25491	.34212	.26667	.36363	.27864	.38628	50
51	358	201	511	247	686	400	884	666	51
52	377	234	530	282	706	437	905	705	52
53	396	267	549	317	726	474	925	744	53
54	415	301	569	352	746	511	945	783	54
55	.24434	.32334	.25588	.34387	.26766	.36548	.27965	.38822	55
56	453	368	608	423	785	585	985	860	56
57	472	401	627	458	805	622	.28005	899	57
58	491	434	647	493	825	659	026	938	58
59	510	468	666	528	845	696	046	977	59
60	.24529	.32501	.25686	.34563	.26865	.36733	.28066	.39016	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	44°		45°		46°		47°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.28066	.39016	.29289	.41421	.30534	.43956	.31800	.46628	0
1	086	055	310	463	555	999	821	674	1
2	106	095	330	504	576	.44042	843	719	2
3	127	134	351	545	597	086	864	765	3
4	147	173	372	586	618	129	885	811	4
5	.28167	.39212	.29392	.41627	.30639	.44173	.31907	.46857	5
6	187	251	413	669	660	217	928	903	6
7	208	291	433	710	681	260	949	949	7
8	228	330	454	752	702	304	971	995	8
9	248	369	475	793	723	347	992	.47041	9
10	.28268	.39409	.29495	.41835	.30744	.44391	.32013	.47087	10
11	289	448	516	876	765	435	035	134	11
12	309	487	537	918	786	479	056	180	12
13	329	527	557	959	807	523	077	226	13
14	350	566	578	.42001	828	567	099	272	14
15	.28370	.39606	.29599	.42042	.30849	.44610	.32120	.47319	15
16	390	646	619	084	870	654	141	365	16
17	410	685	640	126	891	698	163	411	17
18	431	725	661	168	912	742	184	458	18
19	451	764	681	209	933	787	205	504	19
20	.28471	.39804	.29702	.42251	.30954	.44831	.32227	.47551	20
21	492	844	723	293	975	875	248	598	21
22	512	884	743	335	996	919	270	644	22
23	532	924	764	377	.31017	963	291	691	23
24	553	963	785	419	038	.45007	312	738	24
25	.28573	.40003	.29805	.42461	.31059	.45052	.32334	.47784	25
26	593	043	826	503	080	096	355	831	26
27	614	083	847	545	101	141	377	878	27
28	634	123	868	587	122	185	398	925	28
29	655	163	888	630	143	229	420	972	29
30	.28675	.40203	.29909	.42672	.31165	.45274	.32441	.48019	30
31	695	243	930	714	186	319	462	066	31
32	716	283	951	756	207	363	484	113	32
33	736	324	971	799	228	408	505	160	33
34	757	364	992	841	249	452	527	207	34
35	.28777	.40404	.30013	.42883	.31270	.45497	.32548	.48254	35
36	797	444	034	926	291	542	570	301	36
37	818	485	054	968	312	587	591	349	37
38	838	525	075	.43011	334	631	613	396	38
39	859	565	096	053	355	676	634	443	39
40	.28879	.40606	.30117	.43096	.31376	.45721	.32656	.48491	40
41	900	646	138	139	397	766	677	538	41
42	920	687	158	181	418	811	699	586	42
43	941	727	179	224	439	856	720	633	43
44	961	768	200	267	461	901	742	681	44
45	.28981	.40808	30221	.43309	.31482	.45946	.32763	.48728	45
46	.29002	849	242	352	503	992	785	776	46
47	022	890	263	395	524	.46037	806	824	47
48	043	930	283	438	545	082	828	871	48
49	063	971	304	481	566	127	849	919	49
50	.29084	.41012	.30325	.43524	.31588	.46173	.32871	.48967	50
51	104	053	346	567	609	218	893	.49015	51
52	125	093	367	610	630	263	914	063	52
53	145	134	388	653	651	309	936	111	53
54	166	175	409	696	673	354	957	159	54
55	.29187	.41216	.30430	.43739	.31694	.46400	.32979	.49207	55
56	207	257	451	783	715	445	.33001	255	56
57	228	298	471	826	736	491	022	303	57
58	248	339	492	869	758	537	044	351	58
59	269	380	513	912	779	582	065	399	59
60	.29289	.41421	.30534	.43956	.31800	.46628	.33087	.49448	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	48°		49°		50°		51°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.33087	.49448	.34394	.52425	.35721	.55572	.37068	.58902	0
1	109	496	416	476	744	626	091	959	1
2	130	544	438	527	766	680	113	.59016	2
3	152	593	460	579	788	734	136	073	3
4	173	641	482	630	810	789	158	130	4
5	.33195	.49690	.34504	.52681	.35833	.55843	.37181	.59188	5
6	217	738	526	732	855	897	204	245	6
7	238	787	548	784	877	951	226	302	7
8	260	835	570	835	900	.56005	249	360	8
9	282	884	592	886	922	060	272	418	9
10	.33303	.49933	.34614	.52938	.35944	.56114	.37294	.59475	10
11	325	981	636	989	967	169	317	533	11
12	347	.50030	658	.53041	989	223	340	590	12
13	368	079	680	092	.36011	278	362	648	13
14	390	128	702	144	034	332	385	706	14
15	.33412	.50177	.34724	.53196	.36056	.56387	.37408	.59764	15
16	434	226	746	247	078	442	430	822	16
17	455	275	768	299	101	497	453	880	17
18	477	324	790	351	123	551	476	938	18
19	499	373	812	403	146	606	498	996	19
20	.33520	.50422	.34834	.53455	.36168	.56661	.37521	.60054	20
21	542	471	856	507	190	716	544	112	21
22	564	521	878	559	213	771	567	171	22
23	586	570	900	611	235	826	589	229	23
24	607	619	923	663	258	881	612	287	24
25	.33629	.50669	.34945	.53715	.36280	.56937	.37635	.60346	25
26	651	718	967	768	302	992	658	404	26
27	673	767	989	820	325	.57047	680	463	27
28	694	817	.35011	872	347	103	703	521	28
29	716	866	033	924	370	158	726	580	29
30	.33738	.50916	.35055	.53977	.36392	.57213	.37749	.60639	30
31	760	966	077	.54029	415	269	771	698	31
32	782	.51015	099	082	437	324	794	756	32
33	803	065	122	134	460	380	817	815	33
34	825	115	144	187	482	436	840	874	34
35	.33847	.51165	.35166	.54240	.36540	.57491	.37862	.60933	35
36	869	215	188	292	527	547	885	992	36
37	891	265	210	345	549	603	908	.61051	37
38	912	314	232	398	572	659	931	111	38
39	934	364	254	451	594	715	954	170	39
40	.33956	.51415	.35277	.54504	.36617	.57771	.37976	.61229	40
41	978	465	299	557	639	827	999	288	41
42	.34000	515	321	610	662	883	.38022	348	42
43	022	565	343	663	684	939	045	407	43
44	044	615	365	716	707	995	068	467	44
45	.34065	.51665	.35388	.54769	.36729	.58051	.38091	.61526	45
46	087	716	410	822	752	108	113	586	46
47	109	766	432	876	775	164	136	646	47
48	131	817	454	929	797	221	159	705	48
49	153	867	476	982	820	277	182	765	49
50	.34175	.51918	.35499	.55036	.36842	.58333	.38205	.61825	50
51	197	968	521	089	865	390	228	885	51
52	219	.52019	543	143	887	447	251	945	52
53	241	069	565	196	910	503	274	.62005	53
54	262	120	588	250	932	560	296	065	54
55	.34284	.52171	.35610	.55303	.36955	.58617	.38319	.62125	55
56	306	222	632	357	978	674	342	185	56
57	328	273	654	411	.37000	731	365	246	57
58	350	323	677	465	023	788	388	306	58
59	372	374	699	518	045	845	411	366	59
60	.34394	.52425	.35721	.55572	.37068	.58902	.38434	.62427	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	52°		53°		54°		55°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.38434	.62427	.39818	.66164	.41221	.70130	.42642	.74345	0
1	457	487	842	228	245	198	666	417	1
2	480	548	865	292	269	267	690	490	2
3	503	609	888	357	292	335	714	562	3
4	526	669	911	421	316	403	738	635	4
5	.38549	.62730	.39935	.66486	.41339	.70472	.42762	.74708	5
6	571	791	958	550	363	540	785	781	6
7	594	852	981	615	386	609	809	854	7
8	617	913	.40005	679	410	677	833	927	8
9	640	974	028	744	433	746	857	.75000	9
10	.38663	.63035	.40051	.66809	.41457	.70815	.42881	.75073	10
11	686	096	074	873	481	884	905	146	11
12	709	157	098	938	504	953	929	219	12
13	732	218	121	.67003	528	.71022	953	293	13
14	755	279	144	068	551	091	976	366	14
15	.38778	.63341	.40168	.67133	.41575	.71160	.43000	.75440	15
16	801	402	191	198	599	229	024	513	16
17	824	464	214	264	622	298	048	587	17
18	847	525	237	329	646	368	072	661	18
19	870	587	261	394	670	437	096	734	19
20	.38893	.63648	.40284	.67460	.41693	.71506	.43120	.75808	20
21	916	710	307	525	717	576	144	882	21
22	939	772	331	591	740	646	168	956	22
23	962	834	354	656	764	715	192	.76031	23
24	985	895	378	722	788	785	216	105	24
25	.39009	.63957	.40401	.67788	.41811	.71855	.43240	.76179	25
26	032	.64019	424	853	835	925	264	253	26
27	055	081	448	919	859	995	287	328	27
28	078	144	471	985	882	.72065	311	402	28
29	101	206	494	.68051	906	135	335	477	29
30	.39124	.64268	.40518	.68117	.41930	.72205	.43359	.76552	30
31	147	330	541	183	953	275	383	626	31
32	170	393	564	250	977	346	407	701	32
33	193	455	588	316	.42001	416	431	766	33
34	216	518	611	382	024	487	455	851	34
35	.39239	.64580	.40635	.68449	.42048	.72557	.43479	.76926	35
36	262	643	658	515	072	628	503	.77001	36
37	286	705	682	582	096	698	527	077	37
38	309	768	705	648	119	769	551	152	38
39	332	831	728	715	143	840	575	227	39
40	.39355	.64894	.40752	.68782	.42167	.72911	.43599	.77303	40
41	378	957	775	848	190	982	623	378	41
42	401	.65020	799	915	214	.73053	647	454	42
43	424	083	822	982	238	124	671	530	23
44	447	146	846	.69049	262	195	695	606	44
45	.39471	.65209	.40869	.69116	.42285	.73267	.43720	.77681	45
46	494	272	892	183	309	338	744	757	46
47	517	335	916	250	333	409	768	833	47
48	540	399	939	318	357	481	792	910	48
49	563	462	963	385	381	552	816	986	49
50	.39586	.65526	.40986	.69452	.42404	.73624	.43840	.78062	50
51	610	589	.41010	520	428	696	864	138	51
52	633	653	033	587	452	768	888	215	52
53	656	717	057	655	476	840	912	291	53
54	679	780	080	723	499	911	936	368	54
55	.39702	.65844	.41104	.69790	.42523	.73983	.43960	.78445	55
56	726	908	127	858	547	.74056	984	521	56
57	749	972	151	926	571	128	.44008	598	57
58	772	.66036	174	994	595	200	032	675	58
59	795	100	198	.70062	619	272	057	752	59
60	.39818	.66164	.41221	.70130	.42642	.74345	.44081	.78829	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	56°		57°		58°		59°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.44081	.78829	.45536	.83608	.47008	.88708	.48496	.94160	0
1	105	906	560	690	033	796	521	254	1
2	129	984	585	773	057	884	546	349	2
3	153	.79061	609	855	082	972	571	443	3
4	177	138	634	938	107	.89060	596	537	4
5	.44201	.79216	.45658	.84020	.47131	.89148	.48621	.94632	5
6	225	293	683	103	156	237	646	726	6
7	250	371	707	186	181	325	671	821	7
8	274	449	731	269	206	414	696	916	8
9	298	527	756	352	230	503	721	.95011	9
10	.44322	.79604	.45780	.84435	.47255	.89591	.48746	.95106	10
11	346	682	805	518	280	680	771	201	11
12	370	761	829	601	304	769	796	296	12
13	395	839	854	685	329	858	821	392	13
14	419	917	878	768	354	948	846	487	14
15	.44443	.79995	.45903	.84852	.47379	.90037	.48871	.95583	15
16	467	.80074	927	935	403	126	896	678	16
17	491	152	951	.85019	428	216	921	774	17
18	516	231	976	103	453	305	946	870	18
19	540	309	.46000	187	478	395	971	966	19
20	.44564	.80388	.46025	.85271	.47502	.90485	.48996	.96062	20
21	588	467	049	355	527	575	.49021	158	21
22	612	546	074	439	552	665	046	255	22
23	637	625	098	523	577	755	071	351	23
24	661	704	123	608	601	845	096	448	24
25	.44685	.80783	.46147	.85692	.47626	.90935	.49121	.96544	25
26	709	862	172	777	651	.91026	146	641	26
27	734	942	196	861	676	116	171	738	27
28	758	.81021	221	946	701	207	196	835	28
29	782	101	246	.86031	725	297	221	932	29
30	.44806	.81180	.46270	.86116	.47750	.91388	.49246	.97029	30
31	831	260	295	201	775	479	271	127	31
32	855	340	319	286	800	570	296	224	32
33	879	419	344	371	825	661	321	322	33
34	903	499	368	457	849	752	346	420	34
35	.44928	.81579	.46393	.86542	.47874	.91844	.49372	.97517	35
36	952	659	417	627	899	935	397	615	36
37	976	740	442	713	924	.92027	422	713	37
38	.45001	820	466	799	949	118	447	811	38
39	025	900	491	885	974	210	472	910	39
40	.45049	.81981	.46516	.86970	.47998	.92302	.49497	.98008	40
41	073	.82061	540	.87056	.48023	394	522	107	41
42	098	142	565	142	048	486	547	205	42
43	122	222	589	229	073	578	572	304	43
44	146	303	614	315	098	670	597	403	44
45	.45171	.82384	.46639	.87401	.48123	.92762	.49623	.98502	45
46	195	465	663	488	148	855	648	601	46
47	219	546	688	574	172	947	673	700	47
48	244	627	712	661	197	.93040	698	799	48
49	268	709	737	748	222	133	723	899	49
50	.45292	.82790	.46762	.87834	.48247	.93226	.49748	.98998	50
51	317	871	786	921	272	319	773	.99098	51
52	341	953	811	.88008	297	412	799	198	52
53	365	.83034	836	095	322	505	824	298	53
54	390	116	860	183	347	598	849	398	54
55	.45414	.83198	.46885	.88270	.48372	.93692	.49874	.99498	55
56	439	280	909	357	396	785	899	598	56
57	463	362	934	445	421	879	924	698	57
58	487	444	959	532	446	973	950	799	58
59	512	526	983	620	471	.94066	975	899	59
60	.45536	.83608	.47008	.88708	.48496	.94160	.50000	1.00000	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	60°		61°		62°		63°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.50000	1.00000	.51519	1.06267	.53053	1.13005	.54601	1.20269	0
1	025	.00101	544	.06375	079	.13122	627	.20395	1
2	050	.00202	570	.06483	104	.13239	653	.20521	2
3	076	.00303	595	.06592	130	.13356	679	.20647	3
4	101	.00404	621	.06701	156	.13473	705	.20773	4
5	.50126	1.00505	.51646	1.06809	.53181	1.13590	.54731	1.20900	5
6	151	.00607	672	.06918	207	.13707	757	.21026	6
7	176	.00708	697	.07027	233	.13825	782	.21153	7
8	202	.00810	723	.07137	258	.13942	808	.21280	8
9	227	.00912	748	.07246	284	.14060	834	.21407	9
10	.50252	1.01014	.51774	1.07356	.53310	1.14178	.54860	1.21535	10
11	277	.01116	799	.07465	336	.14296	886	.21662	11
12	303	.01218	825	.07575	361	.14414	912	.21790	12
13	328	.01320	850	.07685	387	.14533	938	.21918	13
14	353	.01422	876	.07795	413	.14651	964	.22045	14
15	.50378	1.01525	.51901	1.07905	.53439	1.14770	.54990	1.22174	15
16	404	.01628	927	.08015	464	.14889	.55016	.22302	16
17	429	.01730	952	.08126	490	.15008	042	.22430	17
18	454	.01833	978	.08236	516	.15127	068	.22559	18
19	479	.01936	.52003	.08347	542	.15246	094	.22688	19
20	.50505	1.02039	.52029	1.08458	.53567	1.15366	.55120	1.22817	20
21	530	.02143	054	.08569	593	.15485	146	.22946	21
22	555	.02246	080	.08680	619	.15605	172	.23075	22
23	581	.02349	105	.08791	645	.15725	198	.23205	23
24	606	.02453	131	.08903	670	.15845	224	.23334	24
25	.50631	1.02557	.52156	1.09014	.53696	1.15965	.55250	1.23464	25
26	656	.02661	182	.09126	722	.16085	276	.23594	26
27	682	.02765	207	.09238	748	.16206	302	.23724	27
28	707	.02869	233	.09350	774	.16326	328	.23855	28
29	732	.02973	259	.09462	799	.16447	354	.23985	29
30	.50758	1.03077	.52284	1.09574	.53825	1.16568	.55380	1.24116	30
31	783	.03182	310	.09686	851	.16689	406	.24247	31
32	808	.03286	335	.09799	877	.16810	432	.24378	32
33	834	.03391	361	.09911	903	.16932	458	.24509	33
34	859	.03496	386	.10024	928	.17053	484	.24640	34
35	.50884	1.03601	.52412	1.10137	.53954	1.17175	.55510	1.24772	35
36	910	.03706	438	.10250	980	.17297	536	.24903	36
37	935	.03811	463	.10363	.54006	.17419	563	.25035	37
38	960	.03916	489	.10477	032	.17541	589	.25167	38
39	986	.04022	514	.10590	058	.17663	615	.25300	39
40	.51011	1.04128	.52540	1.10704	.54083	1.17786	.55641	1.25432	40
41	036	.04233	566	.10817	109	.17909	667	.25565	41
42	062	.04339	591	.10931	135	.18031	693	.25697	42
43	087	.04445	617	.11045	161	.18154	719	.25830	43
44	112	.04551	642	.11159	187	.18277	745	.25963	44
45	.51138	1.04657	.52668	1.11274	.54213	1.18401	.55771	1.26097	45
46	163	.04764	694	.11388	238	.18524	797	.26230	46
47	189	.04870	719	.11503	264	.18648	823	.26364	47
48	214	.04977	745	.11617	290	.18772	849	.26498	48
49	239	.05084	771	.11732	316	.18895	876	.26632	49
50	.51265	1.05191	.52796	1.11847	.54342	1.19019	.55902	1.26766	50
51	290	.05298	822	.11963	368	.19144	928	.26900	51
52	316	.05405	847	.12078	394	.19268	954	.27035	52
53	341	.05512	873	.12193	420	.19393	980	.27169	53
54	366	.05619	899	.12309	446	.19517	.56006	.27304	54
55	.51392	1.05727	.52924	1.12425	.54471	1.19642	.56032	1.27439	55
56	417	.05835	950	.12540	497	.19767	058	.27574	56
57	443	.05942	976	.12657	523	.19892	084	.27710	57
58	468	.06050	.53001	.12773	549	.20018	111	.27845	58
59	494	.06158	027	.12889	575	.20143	137	.27981	59
60	.51519	1.06267	.53053	1.13005	.54601	1.20269	.56163	1.28117	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	64°		65°		66°		67°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.56163	1.28117	.57738	1.36620	.59326	1.45859	.60927	1.55930	0
1	189	.28253	765	.36768	353	.46020	954	.56106	1
2	215	.28390	791	.36916	379	.46181	980	.56282	2
3	241	.28526	817	.37064	406	.46342	.61007	.56458	3
4	267	.28663	844	.37212	433	.46504	034	.56634	4
5	.56294	1.28800	.57870	1.37361	.59459	1.46665	.61061	1.56811	5
6	320	.28937	896	.37509	486	.46827	088	.56988	6
7	346	.29074	923	.37658	512	.46989	114	.57165	7
8	372	.29211	949	.37808	539	.47152	141	.57342	8
9	398	.29349	976	.37957	566	.47314	168	.57520	9
10	.56425	1.29487	.58002	1.38107	.59592	1.47477	.61195	1.57698	10
11	451	.29625	028	.38256	619	.47640	222	.57876	11
12	477	.29763	055	.38406	645	.47804	248	.58054	12
13	503	.29901	081	.38556	672	.47967	275	.58233	13
14	529	.30040	108	.38707	699	.48131	302	.58412	14
15	.56555	1.30179	.58134	1.38857	.59725	1.48295	.61329	1.58591	15
16	582	.30318	160	.39008	752	.48459	356	.58771	16
17	608	.30457	187	.39159	779	.48624	383	.58950	17
18	634	.30596	213	.39311	805	.48789	409	.59130	18
19	660	.30735	240	.39462	832	.48954	436	.59311	19
20	.56687	1.30875	.58266	1.39614	.59859	1.49119	.61463	1.59491	20
21	713	.31015	293	.39766	885	.49284	490	.59672	21
22	739	.31155	319	.39918	912	.49450	517	.59853	22
23	765	.31295	345	.40070	938	.49616	544	.60035	23
24	791	.31436	372	.40222	965	.49782	570	.60217	24
25	.56818	1.31576	.58398	1.40375	.59992	1.49948	.61597	1.60399	25
26	844	.31717	425	.40528	.60018	.50115	624	.60581	26
27	870	.31858	451	.40681	045	.50282	651	.60763	27
28	896	.31999	478	.40835	072	.50449	678	.60946	28
29	923	.32140	504	.40988	098	.50617	705	.61129	29
30	.56949	1.32282	.58531	1.41142	.60125	1.50784	.61732	1.61313	30
31	975	.32424	557	.41296	152	.50952	759	.61496	31
32	.57001	.32566	584	.41450	178	.51120	785	.61680	32
33	028	.32708	610	.41605	205	.51289	812	.61864	33
34	054	.32850	637	.41760	232	.51457	839	.62049	34
35	.57080	1.32993	.58663	1.41914	.60259	1.51626	.61866	1.62234	35
36	106	.33135	690	.42070	285	.51795	893	.62419	36
37	133	.33278	716	.42225	312	.51965	920	.62604	37
38	159	.33422	743	.42380	339	.52134	947	.62790	38
39	185	.33565	769	.42536	365	.52304	974	.62976	39
40	.57212	1.33708	.58796	1.42692	.60392	1.52474	.62001	1.63162	40
41	238	.33852	822	.42848	419	.52645	027	.63348	41
42	264	.33996	849	.43005	445	.52815	054	.63535	42
43	291	.34140	875	.43162	472	.52986	081	.63722	43
44	317	.34284	902	.43318	499	.53157	108	.63909	44
45	.57343	1.34429	.58928	1.43476	.60526	1.53329	.62135	1.64097	45
46	369	.34573	955	.43633	552	.53500	162	.64285	46
47	396	.34718	981	.43790	579	.53672	189	.64473	47
48	422	.34863	.59008	.43948	606	.53845	216	.64662	48
49	448	.35009	034	.44106	633	.54017	243	.64851	49
50	.57475	1.35154	.59061	1.44264	.60659	1.54190	.62270	1.65040	50
51	501	.35300	087	.44423	686	.54363	297	.65229	51
52	527	.35446	114	.44582	713	.54536	324	.65419	52
53	554	.35592	140	.44741	740	.54709	351	.65609	53
54	580	.35738	167	.44900	766	.54883	378	.65799	54
55	.57606	1.35885	.59194	1.45059	.60793	1.55057	.62405	1.65989	55
56	633	.36031	220	.45219	820	.55231	431	.66180	56
57	659	.36178	247	.45378	847	.55405	458	.66371	57
58	685	.36325	273	.45539	873	.55580	485	.66563	58
59	712	.36473	300	.45699	900	.55755	512	.66755	59
60	.57738	1.36620	.59326	1.45859	.60927	1.55930	.62539	1.66947	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	68°		69°		70°		71°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.62539	1.66947	.64163	1.79043	.65798	1.92380	.67443	2.07155	0
1	566	.67139	190	.79254	825	.92614	471	.07415	1
2	593	.67332	218	.79466	853	.92849	498	.07675	2
3	620	.67525	245	.79679	880	.93083	526	.07936	3
4	647	.67718	272	.79891	907	.93318	553	.08197	4
5	.62674	1.67911	.64299	1.80104	.65935	1.93554	.67581	2.08459	5
6	701	.68105	326	.80318	962	.93790	608	.08721	6
7	728	.68299	353	.80531	989	.94026	636	.08983	7
8	755	.68494	381	.80746	.66017	.94263	663	.09246	8
9	782	.68689	408	.80960	044	.94500	691	.09510	9
10	.62809	1.68884	.64435	1.81175	.66071	1.94737	.67718	2.09774	10
11	836	.69079	462	.81390	099	.94975	746	.10038	11
12	863	.69275	489	.81605	126	.95213	773	.10303	12
13	890	.69471	516	.81821	154	.95452	801	.10568	13
14	917	.69667	544	.82037	181	.95691	829	.10834	14
15	.62944	1.69864	.64571	1.82254	.66208	1.95931	.67856	2.11101	15
16	971	.70061	598	.82471	236	.96171	884	.11367	16
17	998	.70258	625	.82688	263	.96411	911	.11635	17
18	.63025	.70455	653	.82906	290	.96652	939	.11903	18
19	052	.70653	680	.83124	318	.96893	966	.12171	19
20	.63079	1.70851	.64707	1.83342	.66345	1.97135	.67994	2.12440	20
21	106	.71050	734	.83561	373	.97377	.68021	.12709	21
22	133	.71249	761	.83780	400	.97619	049	.12979	22
23	161	.71448	789	.83999	427	.97862	077	.13249	23
24	188	.71647	816	.84219	455	.98106	104	.13520	24
25	.63215	1.71847	.64843	1.84439	.66482	1.98349	.68132	2.13791	25
26	242	.72047	870	.84659	510	.98594	159	.14063	26
27	269	.72247	898	.84880	537	.98838	187	.14335	27
28	296	.72448	925	.85102	564	.99083	214	.14608	28
29	323	.72649	952	.85323	592	.99329	242	.14881	29
30	.63350	1.72850	.64979	1.85545	.66619	1.99574	.68270	2.15155	30
31	377	.73052	.65007	.85767	647	.99821	297	.15429	31
32	404	.73254	034	.85990	674	2.00067	325	.15704	32
33	431	.73456	061	.86213	702	.00315	352	.15979	33
34	458	.73659	088	.86437	729	.00562	380	.16255	34
35	.63485	1.73862	.65116	1.86661	.66756	2.00810	.68407	2.16531	35
36	512	.74065	143	.86885	784	.01059	435	.16808	36
37	539	.74269	170	.87109	811	.01308	463	.17085	37
38	566	.74473	197	.87334	839	.01557	490	.17363	38
39	594	.74677	225	.87560	866	.01807	518	.17641	39
40	.63621	1.74881	.65252	1.87785	.66894	2.02057	.68546	2.17920	40
41	648	.75086	279	.88011	921	.02308	573	.18199	41
42	675	.75292	306	.88238	949	.02559	601	.18479	42
43	702	.75497	334	.88465	976	.02810	628	.18759	43
44	729	.75703	361	.88692	.67003	.03062	656	.19040	44
45	.63756	1.75909	.65388	1.88920	.67031	2.03315	.68684	2.19322	45
46	783	.76116	416	.89148	058	.03568	711	.19604	46
47	810	.76323	443	.89376	086	.03821	739	.19886	47
48	838	.76530	470	.89605	113	.04075	767	.20169	48
49	865	.76737	497	.89834	141	.04329	794	.20453	49
50	.63892	1.76945	.65525	1.90063	.67168	2.04584	.68822	2.20737	50
51	919	.77154	552	.90293	196	.04839	849	.21021	51
52	946	.77362	579	.90524	223	.05094	877	.21306	52
53	973	.77571	607	.90754	251	.05350	905	.21592	53
54	.64000	.77780	634	.90986	278	.05607	932	.21878	54
55	.64027	1.77990	.65661	1.91217	.67306	2.05864	.68960	2.22165	55
56	055	.78200	689	.91449	333	.06121	988	.22452	56
57	082	.78410	716	.91681	361	.06379	.69015	.22740	57
58	109	.78621	743	.91914	388	.06637	043	.23028	58
59	136	.78832	771	.92147	416	.06896	071	.23317	59
60	.64163	1.79043	.65798	1.92380	.67443	2.07155	.69098	2.23607	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	72°		73°		74°		75°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.69098	2.23607	.70763	2.42030	.72436	2.62796	.74118	2.86370	0
1	126	.23897	791	.42356	464	.63164	146	.86790	1
2	154	.24187	818	.42683	492	.63533	174	.87211	2
3	181	.24478	846	.43010	520	.63903	202	.87633	3
4	209	.24770	874	.43337	548	.64274	231	.88056	4
5	.69237	2.25062	.70902	2.43666	.72576	2.64645	.74259	2.88479	5
6	264	.25355	930	.43995	604	.65018	287	.88904	6
7	292	.25648	958	.44324	632	.65391	315	.89330	7
8	320	.25942	985	.44655	660	.65765	343	.89756	8
9	347	.26237	.71013	.44986	688	.66140	371	.90184	9
10	.69375	2.26531	.71041	2.45317	.72716	2.66515	.74399	2.90613	10
11	403	.26827	069	.45650	744	.66892	427	.91042	11
12	430	.27123	097	.45983	772	.67269	455	.91473	12
13	458	.27420	125	.46316	800	.67647	484	.91904	13
14	486	.27717	153	.46651	828	.68025	512	.92337	14
15	.69514	2.28015	.71180	2.46986	.72856	2.68405	.74540	2.92770	15
16	541	.28313	208	.47321	884	.68785	568	.93204	16
17	569	.28612	236	.47658	912	.69167	596	.93640	17
18	597	.28912	264	.47995	940	.69549	624	.94076	18
19	624	.29212	292	.48333	968	.69931	652	.94514	19
20	.69652	2.29512	.71320	2.48671	.72996	2.70315	.74680	2.94952	20
21	680	.29814	348	.49010	.73024	.70700	709	.95392	21
22	708	.30115	375	.49350	952	.71085	737	.95832	22
23	735	.30418	403	.49691	080	.71471	765	.96274	23
24	763	.30721	431	.50032	108	.71858	793	.96716	24
25	.69791	2.31024	.71459	2.50374	.73136	2.72246	.74821	2.97160	25
26	818	.31328	487	.50716	164	.72635	849	.97604	26
27	846	.31633	515	.51060	192	.73024	878	.98050	27
28	874	.31939	543	.51404	220	.73414	906	.98497	28
29	902	.32244	571	.51748	248	.73806	934	.98944	29
30	.69929	2.32551	.71598	2.52094	.73276	2.74198	.74962	2.99393	30
31	957	.32858	626	.52440	304	.74591	990	.99843	31
32	985	.33166	654	.52787	332	.74984	.75018	3.00293	32
33	.70013	.33474	682	.53134	360	.75379	046	.00745	33
34	040	.33783	710	.53482	388	.75775	075	.01198	34
35	.70068	2.34092	.71738	2.53831	.73416	2.76171	.75103	3.01652	35
36	096	.34403	766	.54181	444	.76568	131	.02107	36
37	124	.34713	794	.54531	472	.76966	159	.02563	37
38	151	.35025	822	.54883	500	.77365	187	.03020	38
39	179	.35336	850	.55234	529	.77765	216	.03479	39
40	.70207	2.35649	.71877	2.55587	.73557	2.78166	.75244	3.03938	40
41	235	.35962	905	.55940	585	.78568	272	.04398	41
42	263	.36276	933	.56294	613	.78970	300	.04860	42
43	290	.36590	961	.56649	641	.79374	328	.05322	43
44	318	.36905	989	.57005	669	.79778	356	.05786	44
45	.70346	2.37221	.72017	2.57361	.73697	2.80183	.75385	3.06251	45
46	374	.37537	045	.57718	725	.80589	413	.06717	46
47	401	.37854	073	.58076	753	.80996	441	.07184	47
48	429	.38171	101	.58434	781	.81404	469	.07652	48
49	457	.38489	129	.58794	809	.81813	497	.08121	49
50	.70485	2.38808	.72157	2.59154	.73837	2.82223	.75526	3.08591	50
51	513	.39128	185	.59514	865	.82633	554	.09063	51
52	540	.39448	213	.59876	893	.83045	582	.09535	52
53	568	.39768	241	.60238	921	.83457	610	.10009	53
54	596	.40089	269	.60601	950	.83871	638	.10484	54
55	.70624	2.40411	.72296	2.60965	.73978	2.84285	.75667	3.10960	55
56	652	.40734	324	.61330	.74006	.84700	695	.11437	56
57	679	.41057	352	.61695	034	.85116	723	.11915	57
58	707	.41381	380	.62061	062	.85533	751	.12394	58
59	735	.41705	408	.62428	090	.85951	780	.12875	59
60	.70763	2.42030	.72436	2.62796	.74118	2.86370	.75808	3.13357	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	76°		77°		78°		79°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.75808	3.13357	.77505	3.44541	.79209	3.80973	.80919	4.24084	0
1	836	.13839	533	.45102	237	.81633	948	.24870	1
2	864	.14323	562	.45664	266	.82294	976	.25658	2
3	892	.14809	590	.46228	294	.82956	.81005	.26448	3
4	921	.15295	618	.46793	323	.83621	033	.27241	4
5	.75949	3.15782	.77647	3.47360	.79351	3.84288	.81062	4.28036	5
6	977	.16271	675	.47928	380	.84956	090	.28833	6
7	.76005	.16761	703	.48498	408	.85627	119	.29634	7
8	034	.17252	732	.49069	437	.86299	148	.30436	8
9	062	.17744	760	.49642	465	.86973	176	.31241	9
10	.76090	3.18238	.77788	3.50216	.79493	3.87649	.81205	4.32049	10
11	118	.18733	817	.50791	522	.88327	233	.32859	11
12	147	.19228	845	.51368	550	.89007	262	.33671	12
13	175	.19725	874	.51947	579	.89689	290	.34486	13
14	203	.20224	902	.52527	607	.90373	319	.35304	14
15	.76231	3.20723	.77930	3.53109	.79636	3.91058	.81348	4.36124	15
16	260	.21224	959	.53692	664	.91746	376	.36947	16
17	288	.21726	987	.54277	693	.92436	405	.37772	17
18	316	.22229	.78015	.54863	721	.93128	433	.38600	18
19	344	.22734	044	.55451	750	.93821	462	.39430	19
20	.76373	3.23239	.78072	3.56041	.79778	3.94517	.81491	4.40263	20
21	401	.23746	101	.56632	807	.95215	519	.41099	21
22	429	.24255	129	.57224	835	.95914	548	.41937	22
23	458	.24764	157	.57819	864	.96616	576	.42778	23
24	486	.25275	186	.58414	892	.97320	605	.43622	24
25	.76514	3.25787	.78214	3.59012	.79921	3.98025	.81633	4.44468	25
26	542	.26300	242	.59611	949	.98733	662	.45317	26
27	571	.26814	271	.60211	978	.99443	691	.46169	27
28	599	.27330	299	.60813	.80006	4.00155	719	.47023	28
29	627	.27847	328	.61417	035	.00869	748	.47881	29
30	.76655	3.28366	.78356	3.62023	.80063	4.01585	.81776	4.48740	30
31	684	.28885	384	.62630	092	.02303	805	.49603	31
32	712	.29406	413	.63238	120	.03024	834	.50468	32
33	740	.29929	441	.63849	149	.03746	862	.51337	33
34	769	.30452	470	.64461	177	.04471	891	.52208	34
35	.76797	3.30977	.78498	3.65074	.80206	4.05197	.81919	4.53081	35
36	825	.31503	526	.65690	234	.05926	948	.53958	36
37	854	.32031	555	.66307	263	.06657	977	.54837	37
38	882	.32560	583	.66925	291	.07390	.82005	.55720	38
39	910	.33090	612	.67545	320	.08125	034	.56605	39
40	.76938	3.33622	.78640	3.68167	.80348	4.08863	.82063	4.57493	40
41	967	.34154	669	.68791	377	.09602	091	.58383	41
42	995	.34689	697	.69417	405	.10344	120	.59277	42
43	.77023	.35224	725	.70044	434	.11088	148	.60174	43
44	052	.35761	754	.70673	462	.11835	177	.61073	44
45	.77080	3.36299	.78782	3.71303	.80491	4.12583	.82206	4.61976	45
46	108	.36839	811	.71935	519	.13334	234	.62881	46
47	137	.37380	839	.72569	548	.14087	263	.63790	47
48	165	.37923	868	.73205	577	.14842	292	.64701	48
49	193	.38466	896	.73843	605	.15599	320	.65616	49
50	.77222	3.39012	.78924	3.74482	.80634	4.16359	.82349	4.66533	50
51	250	.39558	953	.75123	662	.17121	377	.67454	51
52	278	.40106	981	.75766	691	.17886	406	.68377	52
53	307	.40656	.79010	.76411	719	.18652	435	.69304	53
54	335	.41206	038	.77057	748	.19421	463	.70234	54
55	.77363	3.41759	.79067	3.77705	.80776	4.20193	.82492	4.71166	55
56	392	.42312	095	.78355	805	.20966	521	.72102	56
57	420	.42867	123	.79007	833	.21742	549	.73041	57
58	448	.43424	152	.79661	862	.22521	578	.73983	58
59	477	.43982	180	.80316	891	.23301	607	.74929	59
60	.77505	3.44541	.79209	3,80973	.80919	4.24084	.82635	4,75877	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	80°		81°		82°		83°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.82635	4.75877	.84357	5.39245	.86083	6.18530	.87813	7.20551	0
1	664	.76829	385	.40422	111	.20020	842	.22500	1
2	692	.77783	414	.41602	140	.21517	871	.24457	2
3	721	.78742	443	.42787	169	.23019	900	.26425	3
4	750	.79703	471	.43977	198	.24529	929	.28402	4
5	.82778	4.80667	.84500	5.45171	.86227	6.26044	.87957	7.30388	5
6	807	.81635	529	.46369	256	.27566	986	.32384	6
7	836	.82606	558	.47572	284	.29095	.88015	.34390	7
8	864	.83581	586	.48779	313	.30630	044	.36405	8
9	893	.84558	615	.49991	342	.32171	073	.38431	9
10	.82922	4.85539	.84644	5.51208	.86371	6.33719	.88102	7.40466	10
11	950	.86524	673	.52429	400	.35274	131	.42511	11
12	979	.87511	701	.53655	428	.36835	160	.44566	12
13	.83008	.88502	730	.54886	457	.38403	188	.46632	13
14	036	.89497	759	.56121	486	.39978	217	.48707	14
15	.83065	4.90495	.84788	5.57361	.86515	6.41560	.88246	7.50793	15
16	094	.91496	816	.58606	544	.43148	275	.52889	16
17	122	.92501	845	.59855	573	.44743	304	.54996	17
18	151	.93509	874	.61110	601	.46346	333	.57113	18
19	180	.94521	903	.62369	630	.47955	362	.59241	19
20	.83208	4.95536	.84931	5.63633	.86659	6.49571	.88391	7.61379	20
21	237	.96555	960	.64902	688	.51194	420	.63528	21
22	266	.97577	989	.66176	717	.52825	448	.65688	22
23	294	.98603	.85018	.67454	746	.54462	477	.67859	23
24	323	.99633	046	.68738	774	.56107	506	.70041	24
25	.83352	5.00666	.85075	5.70027	.86803	6.57759	.88535	7.72234	25
26	380	.01702	104	.71321	832	.59418	564	.74438	26
27	409	.02743	133	.72620	861	.61085	593	.76653	27
28	438	.03787	162	.73924	890	.62759	622	.78880	28
29	467	.04834	190	.75233	919	.64441	651	.81118	29
30	.83495	5.05886	.85219	5.76547	.86947	6.66130	.88680	7.83367	30
31	524	.06941	248	.77866	976	.67826	709	.85628	31
32	553	.08000	277	.79191	.87005	.69530	737	.87901	32
33	581	.09062	305	.80521	034	.71242	766	.90186	33
34	610	.10129	334	.81856	063	.72962	795	.92482	34
35	.83639	5.11199	.85363	5.83196	.87092	6.74689	.88824	7.94791	35
36	667	.12273	392	.84542	120	.76424	853	.97111	36
37	696	.13350	420	.85893	149	.78167	882	.99444	37
38	725	.14432	449	.87250	178	.79918	911	8.01788	38
39	754	.15517	478	.88612	207	.81677	940	.04146	39
40	.83782	5.16607	.85507	5.89979	.87236	6.83443	.88969	8.06515	40
41	811	.17700	536	.91352	265	.85218	998	.08897	41
42	840	.18797	564	.92731	294	.87001	.89027	.11292	42
43	868	.19898	593	.94115	322	.88792	055	.13699	43
44	897	.21004	622	.95505	351	.90592	084	.16120	44
45	.83926	5.22113	.85651	5.96900	.87380	6.92399	.89113	8.18553	45
46	954	.23226	680	.98301	409	.94216	142	.20999	46
47	983	.24343	708	.99708	438	.96040	171	.23459	47
48	.84012	.25464	737	6.01120	467	.97873	200	.25931	48
49	041	.26590	766	.02538	496	.99714	229	.28417	49
50	.84069	5.27719	.85795	6.03962	.87524	7.01565	.89258	8.30917	50
51	098	.28853	823	.05392	553	.03423	287	.33430	51
52	127	.29991	852	.06828	582	.05291	316	.35957	52
53	155	.31133	881	.08269	611	.07167	345	.38497	53
54	184	.32279	910	.09717	640	.09052	374	.41052	54
55	.84213	5.33429	.85939	6.11171	.87669	7.10946	.89403	8.43620	55
56	242	.34584	967	.12630	698	.12849	431	.46203	56
57	270	.35743	996	.14096	726	.14760	460	.48800	57
58	299	.36906	.86025	.15568	755	.16681	489	.51411	58
59	328	.38073	054	.17046	784	.18612	518	.54037	59
60	.84357	5.39245	.86083	6.18530	.87813	7.20551	.89547	8.56677	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	84°		85°		86°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.89547	8.56677	.91284	10.47371	.93024	13.33559	0
1	576	.59332	313	.51199	053	.39547	1
2	605	.62002	342	.55052	082	.45586	2
3	634	64687	371	.58932	111	.51676	3
4	663	.67387	400	.62837	140	.57817	4
5	.89692	8.70103	.91429	10.66769	.93169	13.64011	5
6	721	.72833	458	.70728	198	.70258	6
7	750	.75579	487	.74714	227	.76558	7
8	779	.78341	516	.78727	257	.82913	8
9	808	.81119	545	.82768	286	.89323	9
10	.89836	8.83912	.91574	10.86837	.93315	13.95788	10
11	865	.86722	603	.90934	344	14.02310	11
12	894	.89547	632	.95060	373	.08890	12
13	923	.92389	661	.99214	402	.15527	13
14	952	.95248	690	11.03397	431	.22223	14
15	.89981	8.98123	.91719	11.07610	.93460	14.28979	15
16	.90010	9.01015	748	.11852	489	.35795	16
17	039	.03923	777	.16125	518	.42672	17
18	068	.06849	806	.20427	547	.49611	18
19	097	.09792	835	.24761	576	.56613	19
20	.90126	9.12752	.91864	11.29125	.93605	14.63679	20
21	155	.15730	893	.33521	634	.70810	21
22	184	.18725	922	.37948	663	.78005	22
23	213	.21739	951	.42408	692	.85268	23
24	242	.24770	980	.46900	721	.92597	24
25	.90271	9.27819	.92009	11.51424	.93750	14.99995	25
26	300	.30887	038	.55981	779	15.07462	26
27	329	.33973	067	.60572	808	.14999	27
28	358	.37077	096	.65197	837	.22607	28
29	386	.40201	125	.69856	866	.30287	29
30	.90415	9.43343	.92154	11.74549	.93895	15.38041	30
31	444	.46505	183	.79278	924	.45869	31
32	473	.49685	212	.84042	953	.53772	32
33	502	.52886	241	.88841	982	.61751	33
34	531	.56106	270	.93677	.94011	.69808	34
35	.90560	9.59346	.92299	11.98549	.94040	15.77944	35
36	589	.62605	328	12.03458	069	.86159	36
37	618	.65885	357	.08404	098	.94456	37
38	647	.69186	386	.13388	127	16.02835	38
39	676	.72507	415	.18411	156	.11297	39
40	.90705	9.75849	.92444	12.23472	.94186	16.19843	40
41	734	.79212	473	.28572	215	.28476	41
42	763	.82596	502	.33712	244	.37196	42
43	792	.86001	531	.38891	273	.46005	43
44	821	.89428	560	.44112	302	.54903	44
45	.90850	9.92877	.92589	12.49373	.94331	16.63893	45
46	879	.96348	618	.54676	360	.72975	46
47	908	.99841	647	.60021	389	.82152	47
48	937	10.03356	676	.65408	418	.91424	48
49	966	.06894	705	.70838	447	17.00794	49
50	.90995	10.10455	.92734	12.76311	.94476	17.10262	50
51	.91024	.14039	763	.81829	505	.19830	51
52	053	.17646	792	.87391	534	.29500	52
53	082	.21277	821	.92999	563	.39274	53
54	111	.24932	850	.98651	592	.49153	54
55	.91140	10.28610	.92879	13.04350	.94621	17.59139	55
56	169	.32313	908	.10096	650	.69233	56
57	197	.36040	937	.15889	679	.79438	57
58	226	.39792	966	.21730	708	.89755	58
59	255	.43569	995	.27620	737	18.00185	59
60	.91284	10.47371	.93024	13.33559	.94766	18.10732	60

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TABLE XXVIII.—*Natural versed sines and external secants*—Continued

M.	87°		88°		89°		M.
	Vers.	Exsec.	Vers.	Exsec.	Vers.	Exsec.	
0	.94766	18.10732	.96510	27.65371	.98255	56.29869	0
1	795	.21397	539	.89440	284	57.26975	1
2	825	.32182	568	28.13917	313	58.27431	2
3	854	.43088	597	.38812	342	59.31411	3
4	883	.54119	626	.64137	371	60.39105	4
5	.94912	18.65275	.96655	28.89903	.98400	61.50715	5
6	941	.76560	684	29.16120	429	62.66460	6
7	970	.87976	714	.42802	458	63.86572	7
8	999	.99524	743	.69960	487	65.11304	8
9	.95028	19.11207	772	.97607	517	66.40927	9
10	.95057	19.23028	.96801	30.25758	.98546	67.75736	10
11	086	.34989	830	.54425	575	69.16047	11
12	115	.47093	859	.83623	604	70.62205	12
13	144	.59341	888	31.13366	633	72.14583	13
14	173	.71737	917	.43671	662	73.73586	14
15	.95202	19.84283	.96946	31.74554	.98691	75.39655	15
16	231	.96982	975	32.06030	720	77.13274	16
17	260	20.09838	.97004	.38118	749	78.94968	17
18	289	.22852	033	.70835	778	80.85315	18
19	318	.36027	062	33.04199	807	82.84947	19
20	.95347	20.49368	.97092	33.38232	.98836	84.94561	20
21	377	.62876	121	.72951	866	87.14924	21
22	406	.76555	150	34.08380	895	89.46886	22
23	435	.90409	179	.44539	924	91.91387	23
24	464	21.04440	208	81452	953	94.49471	24
25	.95493	21.18653	.97237	35.19141	.98982	97.22303	25
26	522	.33050	266	.57633	.99011	100.11185	26
27	551	.47635	295	.96953	040	103.17574	27
28	580	.62413	324	36.37127	069	106.43114	28
29	609	.77386	353	.78185	098	109.89656	29
30	.95638	21.92559	.97382	37.20155	.99127	113.59301	30
31	667	22.07935	411	.63068	156	117.54440	31
32	696	.23520	440	38.06957	186	121.77803	32
33	725	.39316	470	.51855	215	126.32526	33
34	754	.55329	499	.97797	244	131.22229	34
35	.95783	22.71563	.97528	39.44820	.99273	136.51108	35
36	812	.88022	557	.92963	302	142.24061	36
37	841	23.04712	586	40.42266	331	148.46837	37
38	871	.21637	615	.92772	360	155.26228	38
39	900	.38802	644	41.44525	389	162.70325	39
40	.95929	23.56212	.97673	41.97571	.99418	170.88831	40
41	958	.73873	702	42.51961	447	179.93496	41
42	987	.91790	731	43.07746	476	189.98680	42
43	.96016	24.09969	760	.64980	505	201.22122	43
44	045	.28414	789	44.23719	535	213.85995	44
45	.96074	24,47134	.97819	44.84026	.99564	228.18385	45
46	103	.66132	848	45.45963	593	244.55402	46
47	132	.85417	877	46.09596	622	263.44269	47
48	161	25.04994	906	.74997	651	285.47948	48
49	190	.24869	935	47.42241	680	311.52297	49
50	.96219	25.45051	.97964	48.11406	.99709	342.77516	50
51	248	.65545	993	.82576	738	380.97230	51
52	277	.86360	.98022	49.55840	767	428.71873	52
53	307	26.07503	051	50.31290	796	490.10702	53
54	336	.28981	080	51.09027	825	571.95809	54
55	.96365	26.50804	.98109	51.89156	.99855	686.54960	55
56	394	.72978	138	52.71790	884	858.43689	56
57	423	.95512	168	53.57046	913	1144.91574	57
58	452	26.18417	197	54.45053	942	1717.87348	58
59	481	.41700	226	55.35946	971	3436.74682	59
60	.96510	27.65371	.98255	56.29869	1.00000	∞	60

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TABLE XXIX

METHODS OF EXPRESSING GRADIENTS

(The different methods of expressing gradients have their values given for the usual range and to the customary degree of accuracy of their use)

Angle	Feet per 100 feet horizontal or percent	Feet to the mile horizontal	1 vertical on or in—	1 horizontal to—	Batter inches to the foot
Degrees			*Horizontal*	*Vertical*	
¼	0.44	23.0	229	----	----
½	.87	46.1	115	----	----
¾	1.31	69.1	76	----	----
1	1.74	92.2	57	----	----
1¼	2.18	115.1	46	----	----
1½	2.62	138.3	38	----	----
1¾	3.06	161.2	33	----	----
2	3.49	184.4	29	----	----
2½	4.37	230.5	23	----	----
3	5.24	276.7	19	----	----
3½	6.12	322.9	16	----	----
4	6.99	369.2	14	----	----
4½	7.37	415.5	13	----	----
5	8.75	461.9	11.4	----	----
6	10.51	555	9.5	----	----
7	12.28	----	8.1	----	----
8	14.05	----	7.1	----	----
9	15.84	----	6.3	----	----
10	17.63	----	5.7	----	----
15	----	----	3.7	----	----
20	----	----	2.7	----	----
25	----	----	2.1	----	----
30	----	----	1.7	----	----
40	----	----	1.2	----	----
45	----	----	1	1	----
50	----	----	----	1.2	----
60	----	----	----	1.7	----
65	----	----	----	2.1	----
70	----	----	----	2.7	----
75	----	----	----	3.7	3¼
80	----	----	----	5.7	2⅛
81	----	----	----	6.3	1⅞
82	----	----	----	7.1	1¾
83	----	----	----	8.1	1⅝
84	----	----	----	9.5	1¼
85	----	----	----	11.4	1
85½	----	----	----	13	⅞
86	----	----	----	14	----
86½	----	----	----	16	¾
87	----	----	----	19	⅝
87½	----	----	----	23	½
88	----	----	----	29	----
88¼	----	----	----	33	⅜
88½	----	----	----	38	----
88¾	----	----	----	46	¼
89	----	----	----	57	----
89¼	----	----	----	76	----
89½	----	----	----	115	⅛
89¾	----	----	----	229	----

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TABLE XXX

DIFFERENCES IN ELEVATIONS FOR GIVEN HORIZONTAL DISTANCES AND GRADIENTS FROM 0° TO 30°

From the line of the given gradient take out the tabular numbers corresponding to each of the numbers of the given distance. Point off the value found in the table, with as many places to the left of the decimal point as the distance has places. Add the values thus found. The result is the difference of elevation in the same unit as the distance. Example: Find the difference of elevation corresponding to a horizontal distance of 6,273 feet and a gradient of 3°.

		Feet
For	3, opposite 3°, and under 3, point off 1 place	0. 1572
For	70, opposite 3°, and under 7, point off 2 places	03. 668
For	200, opposite 3°, and under 2, point off 3 places	010. 48
For	6,000, opposite 3°, and under 6, point off 4 places	0314. 4
For	6,273, the difference in elevation is	328. 7052

Gradient in degrees	Difference of elevation for horizontal distances of—								
	1	2	3	4	5	6	7	8	9
½	00087	00174	00261	00348	00435	00522	00609	00696	00783
1	00174	00349	00523	00698	00872	01047	01221	01396	01570
1½	00262	00524	00786	01048	01310	01572	01834	02096	02358
2	00349	00698	01047	01396	01745	02094	02443	02792	03141
2½	00436	00872	01308	01744	02180	02616	03052	03488	03924
3	00524	01048	01572	02096	02620	03144	03668	04192	04716
4	00699	01398	02097	02797	03496	04195	04894	05594	06293
5	00875	01750	02625	03500	04375	05250	06125	07000	07875
6	01051	02102	03153	04204	05255	06306	07357	08408	09459
7	01228	02456	03684	04912	06140	07368	08596	09824	11052
8	01405	02810	04216	05621	07027	08432	09837	11243	12648
9	01584	03168	04752	06336	07920	09504	11088	12672	14256
10	01763	03526	05289	07053	08816	10579	12343	14106	15869
12	02125	04251	06376	08502	10628	12753	14879	17004	19130
14	02493	04986	07479	09973	12466	14959	17453	19946	22439
16	02867	05734	08602	11469	14337	17204	20071	22939	25806
18	03249	06498	09747	12996	16245	19494	22743	25992	29241
20	03639	07279	10919	14558	18198	21838	25477	29117	32757
22	04040	08080	12120	16161	20201	24241	28282	32322	36362
24	04452	08904	13356	17809	22261	26713	31166	35618	40070
26	04877	09754	14631	19509	24386	29263	34141	39018	43895
28	05317	10634	15951	21268	26585	31902	37219	42536	47853
30	05773	11547	17320	23094	28867	34641	40414	46188	51961

The difference of elevation for any gradient and any horizontal distance may be obtained by multiplying the distance by the tangent of the angle or gradient.

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TABLE XXXI

DIFFERENCES IN ELEVATIONS FOR GIVEN SLOPE DISTANCES AND GRADIENTS FROM 0° TO 30°

(See explanation under table XXX.)

Gradient in degrees	Difference of elevation for sloping distances of—								
	1	2	3	4	5	6	7	8	9
½	00087	00174	00262	00349	00436	00523	00611	00698	00785
1	00174	00349	00523	00698	00873	01047	01222	01396	01571
1½	00262	00523	00785	01047	01309	01571	01832	02094	02356
2	00349	00698	01047	01396	01745	02094	02443	02792	03141
2½	00436	00872	01308	01745	02181	02617	03053	03489	03926
3	00523	01047	01570	02093	02617	03140	03663	04187	04710
4	00697	01395	02093	02790	03488	04185	04883	05580	06278
5	00871	01743	02615	03486	04358	05229	06101	06972	07844
6	01045	02090	03136	04181	05226	06272	07317	08362	09407
7	01219	02437	03656	04875	06093	07312	08531	09749	10968
8	01392	02783	04175	05567	06959	08350	09742	11134	12525
9	01564	03129	04693	06257	07822	09386	10950	12515	14079
10	01736	03473	05209	06946	08682	10419	12155	13892	15628
12	02079	04158	06237	08316	10395	12475	14554	16633	18712
14	02419	04838	07258	09677	12096	14515	16934	19354	21773
16	02756	05513	08269	11025	13782	16538	19294	22051	24807
18	03090	06180	09270	12361	15451	18541	21631	24721	27811
20	03420	06840	10261	13681	17101	20521	23941	27362	30782
22	03746	07492	11238	14984	18730	22476	26222	29968	33714
24	04067	08135	12202	16269	20337	24404	28471	32539	36606
26	04384	08767	13151	17535	21918	26302	30686	35070	39453
28	04695	09389	14084	18779	23473	28168	32863	37558	42252
30	05000	10000	15000	20000	25000	30000	35000	40000	45000

The difference of elevation for any sloping distance and any angle or gradient may be found by multiplying the distance by the sine of the angle.

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TABLE XXXII

HORIZONTAL DISTANCES FOR GIVEN SLOPE DISTANCES AND GRADIENTS FROM 0° TO 30°

This table is to be used similarly to table XXXI.

Gradient in degrees	Horizontal distances for sloping distances of—								
	1	2	3	4	5	6	7	8	9
1	09998	19997	29995	39994	49992	59991	69989	79988	89986
2	09994	19988	29982	39976	49969	59963	69957	79951	89945
3	09986	19972	29959	39945	49931	59918	69904	79890	89877
4	09976	19951	29927	39902	49878	59854	69829	79805	89781
5	09962	19924	29886	39848	49810	59772	69733	79695	89657
6	09945	19890	29836	39781	49726	59671	69616	79562	89507
7	09925	19851	29776	39702	49627	59553	69478	79404	89329
8	09903	19805	29708	39611	49513	59416	69319	79221	89124
9	09877	19754	29631	39507	49384	59261	69138	79015	88892
10	09848	19696	29544	39392	49240	59088	68936	78785	88633
12	09781	19563	29344	39126	48907	58689	68470	78252	88033
14	09703	19406	29108	38812	48515	58218	67921	77624	87326
16	09613	19225	28838	38450	48063	57676	67288	76901	86513
18	09510	19021	28532	38042	47553	57063	66574	76084	85595
20	09397	18794	28191	37588	46985	56381	65778	75175	84572
22	09272	18544	27815	37087	46359	55631	64903	74175	83446
24	09135	18271	27406	36542	45677	54813	63948	73084	82219
25	09063	18126	27189	36252	45315	54378	63441	72505	81568
26	08988	17976	26964	35952	44940	53928	62915	71903	80891
27	08910	17820	26730	35640	44550	53460	62370	71280	80190
28	08829	17659	26488	35318	44147	52977	61806	70636	79465
29	08746	17492	26238	34985	43731	52477	61223	69969	78716
30	08660	17320	25981	34641	43301	51961	60622	69282	77942

The horizontal distance corresponding to any sloping distance, and any angle or gradient may be found by multiplying the sloping distance by the cosine of the angle.

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TABLE XXXIII

REDUCTION TO THE HORIZONTAL OF DISTANCES PACED ON SLOPES

Distances other than those in the table may be found by simple computations. *Example:* Find the horizontal equivalent of 738 paces on a 5° rising slope.

700 paces on slope = 632.8 paces on level.
30 paces on slope = 27.1 paces on level.
8 paces on slope = 7.2 paces on level.

738 paces on slope = 667.1 paces on level.

This table takes into account the following:

Reduction of slope distance to horizontal.

The fact that a man takes a shorter pace when walking down a slope than when walking on a level.

The fact that a man takes a shorter pace when walking up a slope than when walking down the same slope.

Number of paces measured on the slope	Equivalent number of paces on horizontal, for slopes of—											
	5°		10°		15°		20°		25°		30°	
	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up	Down
100	090.4	095.6	078.7	091.5	069.3	087.4	058.8	080.8	049.1	068.2	035.8	051.4
110	099.4	105.1	086.6	100.6	076.2	096.1	064.7	088.9	054.0	075.0	039.4	056.5
120	108.4	114.7	094.4	109.8	083.2	104.9	070.6	097.0	058.9	081.8	043.0	061.7
130	117.5	124.3	102.3	119.0	090.1	113.6	076.4	105.0	063.8	088.7	046.5	066.8
140	126.6	133.8	110.2	128.1	097.0	122.4	082.3	113.1	068.7	095.5	050.1	072.0
150	135.6	143.4	118.1	137.3	104.0	131.1	088.2	121.2	073.7	102.3	053.7	077.1
160	144.6	153.0	125.9	146.4	110.9	139.8	094.1	129.3	078.6	109.1	057.3	082.2
170	153.7	162.5	133.8	155.6	117.8	148.6	100.0	137.4	083.5	115.9	060.9	087.4
180	162.7	172.1	141.7	164.7	124.7	157.3	105.8	145.4	088.4	122.8	064.4	092.5
190	171.8	181.6	149.5	173.9	131.7	166.1	111.7	153.5	093.3	129.6	068.0	097.7
200	180.8	191.2	157.4	183.0	138.6	174.8	117.6	161.6	098.2	136.4	071.6	102.8
300	271.2	286.8	236.1	274.5	207.9	262.2	176.4	242.4	147.3	204.6	107.4	154.2
400	361.6	382.4	314.8	366.0	277.2	349.6	235.2	323.2	196.4	272.8	143.2	205.6
500	452.0	478.0	393.5	457.5	346.5	437.0	294.0	404.0	245.5	341.0	179.0	257.0
600	542.4	573.6	472.2	549.0	415.8	524.4	352.8	484.8	294.6	409.2	214.8	308.4
700	632.8	669.2	550.9	640.5	485.1	611.8	411.6	565.6	343.7	477.4	250.6	359.8
800	723.2	764.8	629.6	732.0	554.4	699.2	470.4	646.4	392.8	545.6	286.4	411.2
900	813.6	860.4	708.3	823.5	623.7	786.6	529.2	727.2	441.9	613.8	322.2	462.6

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TABLE XXXIV

RADII AND THEIR LOGARITHMS

(The radii and their logarithms are given for degrees of curvature ranging from 0° to 40°. The degree D is the central angle subtended by a chord of 100 feet. *Example:* For a 2° 0′ curve the radius is 2,864.93 feet. The log of 2,864.93 is 3.457115.)

Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.
° ′			° ′			° ′		
0 0	∞	∞	1 0	5729.65	3.758128	2 0	2864.93	3.457115
1	343774.68	5.536274	1	5635.72	.750950	1	2841.26	.453511
2	171887.34	.235244	2	5544.83	.743888	2	2817.97	.449937
3	114591.56	.059153	3	5456.82	.736939	3	2795.06	.446392
4	85943.67	4.934214	4	5371.56	.730100	4	2772.53	.442876
5	68754.94	4.837304	5	5288.92	3.723367	5	2750.35	3.439388
6	57295.79	.758123	6	5208.79	.716737	6	2728.52	.435928
7	49110.68	.691176	7	5131.05	.710206	7	2707.04	.432495
8	42971.84	.633184	8	5055.59	.703772	8	2685.89	.429089
9	38197.20	.582031	9	4982.33	.697432	9	2665.08	.425710
10	34377.48	4.536274	10	4911.15	3.691183	10	2644.58	3.422356
11	31252.26	.494881	11	4841.98	.685023	11	2624.39	.419029
12	28647.90	.457093	12	4774.74	.678949	12	2604.51	.415727
13	26444.22	.422331	13	4709.33	.672959	13	2584.93	.412449
14	24555.35	.390146	14	4645.69	.667051	14	2565.65	.409197
15	22918.33	4.360183	15	4583.75	3.661221	15	2546.64	3.405968
16	21485.94	.332154	16	4523.44	.655469	16	2527.92	.402763
17	20222.06	.305825	17	4464.70	.649792	17	2509.47	.399582
18	19098.61	.281002	18	4407.46	.644189	18	2491.29	.396424
19	18093.43	.257521	19	4351.67	.638656	19	2473.37	.393289
20	17188.76	4.235244	20	4297.28	3.633194	20	2455.70	3.390176
21	16370.25	.214055	21	4244.23	.627799	21	2438.29	.387085
22	15626.15	.193852	22	4192.47	.622470	22	2421.12	.384016
23	14946.75	.174547	23	4141.96	.617206	23	2404.19	.380969
24	14323.97	.156064	24	4092.66	.612005	24	2387.50	.377943
25	13751.02	4.138335	25	4044.51	3.606866	25	2371.04	3.374938
26	13222.13	.121302	26	3997.48	.601787	26	2354.80	.371954
27	12732.43	.104911	27	3951.54	.596766	27	2338.78	.368990
28	12277.70	.089117	28	3906.64	.591803	28	2322.98	.366046
29	11854.33	.073877	29	3862.74	.586896	29	2307.39	.363122
30	11459.19	4.059154	30	3819.83	3.582044	30	2292.01	3.360217
31	11089.54	.044914	31	3777.85	.577245	31	2276.84	.357332
32	10743.00	.031125	32	3736.79	.572499	32	2261.86	.354466
33	10417.45	.017762	33	3696.61	.567804	33	2247.08	.351618
34	10111.06	.004797	34	3657.29	.563160	34	2232.49	.348789
35	9822.18	3.992208	35	3618.80	3.558564	35	2218.09	3.345979
36	9549.34	.979973	36	3581.10	.554017	36	2203.87	.343187
37	9291.25	.968074	37	3544.19	.549517	37	2189.84	.340412
38	9046.75	.956492	38	3508.02	.545063	38	2175.98	.337655
39	8814.78	.945212	39	3472.59	.540654	39	2162.30	.334915
40	8594.42	3.934216	40	3437.87	3.536289	40	2148.79	3.332193
41	8384.80	.923493	41	3403.83	.531968	41	2135.44	.329488
42	8185.16	.913027	42	3370.46	.527690	42	2122.26	.326799
43	7994.81	.902808	43	3337.74	.523453	43	2109.24	.324127
44	7813.11	.892824	44	3305.65	.519257	44	2096.39	.321471
45	7639.49	3.883064	45	3274.17	3.515101	45	2083.68	3.318832
46	7473.42	.873519	46	3243.29	.510985	46	2071.13	.316208
47	7314.41	.864179	47	3212.98	.506908	47	2058.73	.313600
48	7162.03	.855036	48	3183.23	.502868	48	2046.48	.311008
49	7015.87	.846081	49	3154.03	.498866	49	2034.37	.308431
50	6875.55	3.837308	50	3125.36	3.494900	50	2022.41	3.305869
51	6740.74	.828708	51	3097.20	.490970	51	2010.59	.303323
52	6611.12	.820275	52	3069.55	.487075	52	1998.90	.300791
53	6486.38	.812002	53	3042.39	.483215	53	1987.35	.298274
54	6366.26	.803885	54	3015.71	.479389	54	1975.93	.295771
55	6250.51	3.795916	55	2989.48	3.475596	55	1964.64	3.293283
56	6138.90	.788091	56	2963.72	.471836	56	1953.48	.290809
57	6031.20	.780404	57	2938.39	.468109	57	1942.44	.288349
58	5927.22	.772851	58	2913.49	.464413	58	1931.53	.285902
59	5826.76	.765427	59	2889.01	.460749	59	1920.75	.283470
60	5729.65	3.758128	60	2864.93	3.457115	60	1910.08	3.281051

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TABLE XXXIV.—*Radii and their logarithms*—Continued

Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.
° ′			° ′			° ′		
3 0	1910.08	3.281051	4 0	1432.69	3.156151	5 0	1146.28	3.059290
1	1899.53	.278645	1	1426.74	.154346	1	1142.47	.057846
2	1889.09	.276253	2	1420.85	.152548	2	1138.69	.056407
3	1878.77	.273874	3	1415.01	.150758	3	1134.94	.054972
4	1868.56	.271508	4	1409.21	.148975	4	1131.21	.053542
5	1858.47	3.269155	5	1403.46	3.147200	5	1127.50	3.052116
6	1848.48	.266814	6	1397.76	.145431	6	1123.82	.050696
7	1838.59	.264486	7	1392.10	.143670	7	1120.16	.049280
8	1828.82	.262170	8	1386.49	.141916	8	1116.52	.047868
9	1819.14	.259867	9	1380.92	.140169	9	1112.91	.046462
10	1809.57	3.257576	10	1375.40	3.138430	10	1109.33	3.045059
11	1800.10	.255296	11	1369.92	.136697	11	1105.76	.043662
12	1790.73	.253029	12	1364.49	.134971	12	1102.22	.042268
13	1781.45	.250774	13	1359.10	.133251	13	1098.70	.040880
14	1772.27	.248530	14	1353.75	.131539	14	1095.20	.039495
15	1763.18	3.246297	15	1348.45	3.129833	15	1091.73	3.038115
16	1754.19	.244077	16	1343.18	.128134	16	1088.28	.036740
17	1745.29	.241867	17	1337.96	.126442	17	1084.85	.035368
18	1736.48	.239669	18	1332.77	.124756	18	1081.44	.034002
19	1727.75	.237481	19	1327.63	.123077	19	1078.05	.032639
20	1719.12	3.235305	20	1322.53	3.121404	20	1074.68	3.031281
21	1710.57	.233140	21	1317.46	.119738	21	1071.34	.029927
22	1702.10	.230985	22	1312.43	.118078	22	1068.01	.028577
23	1693.72	.228841	23	1307.45	.116424	23	1064.71	.027231
24	1685.42	.226707	24	1302.50	.114777	24	1061.43	.025890
25	1677.20	3.224584	25	1297.58	3.113136	25	1058.16	3.024552
26	1669.06	.222472	26	1292.71	.111501	26	1054.92	.023219
27	1661.00	.220369	27	1287.87	.109872	27	1051.70	.021890
28	1653.02	.218277	28	1283.07	.108249	28	1048.49	.020565
29	1645.11	.216194	29	1278.30	.106632	29	1045.31	.019244
30	1637.28	3.214122	30	1273.57	3.105022	30	1042.14	3.017927
31	1629.52	.212060	31	1268.87	.103417	31	1039.00	.016614
32	1621.84	.210007	32	1264.21	.101818	32	1035.87	.015305
33	1614.22	.207964	33	1259.58	.100225	33	1032.76	.013999
34	1606.68	.205930	34	1254.98	.098638	34	1029.67	.012698
35	1599.21	3.203906	35	1250.42	3.097057	35	1026.60	3.011401
36	1591.81	.201892	36	1245.89	.095481	36	1023.55	.010107
37	1584.48	.199886	37	1241.40	.093912	37	1020.51	.008818
38	1577.21	.197890	38	1236.94	.092347	38	1017.49	.007532
39	1570.01	.195903	39	1232.51	.090789	39	1014.50	.006250
40	1562.88	3.193925	40	1228.11	3.089236	40	1011.51	3.004972
41	1555.81	.191956	41	1223.74	.087688	41	1008.55	.003698
42	1548.80	.189996	42	1219.40	.086147	42	1005.60	.002427
43	1541.86	.188045	43	1215.09	.084610	43	1002.67	.001160
44	1534.98	.186103	44	1210.82	.083079	44	999.76	2.999897
45	1528.16	3.184169	45	1206.57	3.081553	45	996.87	2.998637
46	1521.40	.182244	46	1202.36	.080033	46	993.99	.997381
47	1514.70	.180327	47	1198.17	.078518	47	991.13	.996129
48	1508.06	.178419	48	1194.01	.077008	48	988.28	.994880
49	1501.48	.176519	49	1189.88	.075504	49	985.45	.993635
50	1494.95	3.174627	50	1185.78	3.074005	50	982.64	2.992393
51	1488.48	.172744	51	1181.71	.072511	51	979.84	.991155
52	1482.07	.170868	52	1177.66	.071022	52	977.06	.989921
53	1475.71	.169001	53	1173.65	.069538	53	974.29	.988690
54	1469.41	.167142	54	1169.66	.068059	54	971.54	.987463
55	1463.16	3.165291	55	1165.70	3.066585	55	968.81	2.986239
56	1456.96	.163447	56	1161.76	.065116	56	966.09	.985018
57	1450.81	.161612	57	1157.85	.063653	57	963.39	.983801
58	1444.72	.159784	58	1153.97	.062194	58	960.70	.982587
59	1438.68	.157963	59	1150.11	.060740	59	958.02	.981377
60	1432.69	3.156151	60	1146.28	3.059290	60	955.37	2.980170

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TABLE XXXIV.—*Radii and their logarithms*—Continued

Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.
° ′			° ′			° ′		
6 0	955.37	2.980170	7 0	819.02	2.913295	8 0	716.78	2.855385
1	952.72	.978966	1	817.08	.912263	1	715.29	.854483
2	950.09	.977766	2	815.14	.911234	2	713.81	.853583
3	947.48	.976569	3	813.22	.910208	3	712.33	.852684
4	944.88	.975375	4	811.30	.909183	4	710.87	.851787
5	942.29	2.974185	5	809.40	2.908162	5	709.40	2.850892
6	939.72	.972998	6	807.50	.907142	6	707.94	.849999
7	937.16	.971814	7	805.61	.906125	7	706.49	.849108
8	934.62	.970633	8	803.73	.905111	8	705.05	.848219
9	932.09	.969456	9	801.86	.904098	9	703.61	.847331
10	929.57	2.968282	10	800.00	2.903089	10	702.18	2.846446
11	927.07	.967111	11	798.14	.902081	11	700.75	.845562
12	924.58	.965943	12	796.30	.901076	12	699.33	.844679
13	922.10	.964778	13	794.46	.900073	13	697.91	.843799
14	919.64	.963616	14	792.63	.899073	14	696.50	.842921
15	917.19	2.962458	15	790.81	2.898074	15	695.09	2.842044
16	914.75	.961303	16	789.00	.897079	16	693.70	.841169
17	912.33	.960150	17	787.20	.896085	17	692.30	.840296
18	909.92	.959001	18	785.40	.895094	18	690.91	.839424
19	907.52	.957855	19	783.62	.894104	19	689.53	.838555
20	905.13	2.956711	20	781.84	2.893118	20	688.16	2.837687
21	902.76	.955571	21	780.07	.892133	21	686.78	.836821
22	900.40	.954434	22	778.31	.891151	22	685.42	.835956
23	898.05	.953300	23	776.55	.890171	23	684.06	.835093
24	895.71	.952168	24	774.81	.889193	24	682.70	.834232
25	893.39	2.951040	25	773.07	2.888217	25	681.35	2.833373
26	891.08	.949915	26	771.34	.887244	26	680.01	.832515
27	888.78	.948792	27	769.61	.886272	27	678.67	.831660
28	886.49	.947673	28	767.90	.885303	28	677.34	.830805
29	884.21	.946556	29	766.19	.884336	29	676.01	.829953
30	881.95	2.945442	30	764.49	2.883371	30	674.69	2.829102
31	879.69	.944331	31	762.80	.882409	31	673.37	.828253
32	877.45	.943223	32	761.11	.881448	32	672.06	.827405
33	875.22	.942118	33	759.43	.880490	33	670.75	.826560
34	873.00	.941015	34	757.76	.879534	34	669.45	.825715
35	870.79	2.939916	35	756.10	2.878580	35	668.15	2.824873
36	868.60	.938819	36	754.44	.877627	36	666.86	.824032
37	866.41	.937725	37	752.80	.876678	37	665.57	.823193
38	864.24	.936633	38	751.16	.875730	38	664.29	.822355
39	862.07	.935545	39	749.52	.874784	39	663.01	.821519
40	859.92	2.934459	40	747.89	2.873840	40	661.74	2.820685
41	857.78	.933376	41	746.27	.872898	41	660.47	.819852
42	855.65	.932295	42	744.66	.871959	42	659.21	.819021
43	853.53	.931218	43	743.06	.871021	43	657.95	.818191
44	851.42	.930142	44	741.46	.870086	44	656.69	.817363
45	849.32	2.929070	45	739.87	2.869152	45	655.45	2.816537
46	847.23	.928000	46	738.28	.868221	46	654.20	.815712
47	845.15	.926933	47	736.70	.867291	47	652.96	.814889
48	843.08	.925869	48	735.13	.866363	48	651.73	.814067
49	841.02	.924807	49	733.56	.865438	49	650.50	.813247
50	838.97	2.923747	50	732.01	2.864514	50	649.27	2.812428
51	836.93	.922691	51	730.45	.863593	51	648.05	.811611
52	834.90	.921637	52	728.91	.862673	52	646.84	.810796
53	832.88	.920585	53	727.37	.861755	53	645.63	.809982
54	830.88	.919536	54	725.84	.860840	54	644.42	.809169
55	828.88	2.918490	55	724.31	2.859926	55	643.22	2.808358
56	826.89	.917446	56	722.79	.859014	56	642.02	.807549
57	824.91	.916404	57	721.28	.858104	57	640.83	.806741
58	822.93	.915365	58	719.77	.857196	58	639.64	.805935
59	820.97	.914329	59	718.27	.856290	59	638.45	.805130
60	819.02	2.913295	60	716.78	2.855385	60	637.27	2.804327

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TABLE XXXIV.—*Radii and their logarithms*—Continued

Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.
° ′			° ′			° ′		
9 0	637.27	2.804327	11 0	521.67	2.717397	13 0	441.68	2.645111
2	634.93	.802724	2	520.10	.716087	2	440.56	.644004
4	632.60	.801128	4	518.54	.714781	4	439.44	.642899
6	630.29	.799538	6	516.99	.713479	6	438.33	.641798
8	627.99	.797953	8	515.44	.712181	8	437.22	.640699
10	625.71	2.796374	10	513.91	2.710887	10	436.12	2.639603
12	623.45	.794801	12	512.38	.709596	12	435.02	.638510
14	621.20	.793234	14	510.87	.708310	14	433.93	.637419
16	618.97	.791673	16	509.36	.707027	16	432.84	.636331
18	616.76	.790117	18	507.86	.705748	18	431.76	.635246
20	614.56	2.788566	20	506.38	2.704473	20	430.69	2.634164
22	612.38	.787021	22	504.90	.703202	22	429.62	.633085
24	610.21	.785482	24	503.42	.701934	24	428.56	.632008
26	608.06	.783948	26	501.96	.700671	26	427.50	.630934
28	605.93	.782420	28	500.51	.699410	28	426.44	.629863
30	603.80	2.780897	30	499.06	2.698154	30	425.40	2.628794
32	601.70	.779379	32	497.62	.696901	32	424.35	.627728
34	599.61	.777867	34	496.19	.695652	34	423.32	.626665
36	597.53	.776360	36	494.77	.694407	36	422.28	.625604
38	595.47	.774858	38	493.36	.693165	38	421.26	.624546
40	593.42	2.773361	40	491.96	2.691926	40	420.23	2.623490
42	591.38	.771870	42	490.56	.690692	42	419.22	.622437
44	589.36	.770383	44	489.17	.689460	44	418.20	.621387
46	587.36	.768902	46	487.79	.688233	46	417.19	.620339
48	585.36	.767426	48	486.42	.687008	48	416.19	.619294
50	583.38	2.765955	50	485.05	2.685788	50	415.19	2.618251
52	581.42	.764489	52	483.69	.684570	52	414.20	.617211
54	579.46	.763028	54	482.34	.683357	54	413.21	.616173
56	577.53	.761572	56	481.00	.682146	56	412.23	.615138
58	575.60	.760120	58	479.67	.680939	58	411.25	.614106
10 0	573.69	2.758674	12 0	478.34	2.679735	14 0	410.28	2.613076
2	571.78	.757232	2	477.02	.678535	2	409.31	.612048
4	569.90	.755796	4	475.71	.677338	4	408.34	.611023
6	568.02	.754364	6	474.40	.676145	6	407.38	.610000
8	566.16	.752937	8	473.10	.674954	8	406.42	.608980
10	564.31	2.751514	10	471.81	2.673767	10	405.47	2.607962
12	562.47	.750096	12	470.53	.672584	12	404.53	.606946
14	560.64	.748683	14	469.25	.671403	14	403.58	.605933
16	558.82	.747274	16	467.98	.670226	16	402.65	.604923
18	557.02	.745870	18	466.72	.669052	18	401.71	.603914
20	555.23	2.744471	20	465.46	2.667881	20	400.78	2.602908
22	553.45	.743076	22	464.21	.666713	22	399.86	.601905
24	551.68	.741686	24	462.96	.665549	24	398.94	.600904
26	549.92	.740300	26	461.73	.664388	26	398.02	.599905
28	548.17	.738918	28	460.50	.663229	28	397.11	.598908
30	546.44	2.737541	30	459.28	2.662074	30	396.20	2.597914
32	544.71	.736169	32	458.06	.660922	32	395.30	.596922
34	543.00	.734800	34	456.85	.659773	34	394.40	.595933
36	541.30	.733436	36	455.65	.658628	36	393.50	.594945
38	539.61	.732077	38	454.45	.657485	38	392.61	.593960
40	537.92	2.730721	40	453.26	2.656345	40	391.72	2.592978
42	536.25	.729370	42	452.07	.655208	42	390.84	.591997
44	534.59	.728023	44	450.89	.654075	44	389.96	.591019
46	532.94	.726681	46	449.72	.652944	46	389.08	.590043
48	531.30	.725342	48	448.56	.651816	48	388.21	.589069
50	529.67	2.724008	50	447.40	2.650691	50	387.34	2.588097
52	528.05	.722677	52	446.24	.649570	52	386.48	.587128
54	526.44	.721351	54	445.09	.648451	54	385.62	.586161
56	524.84	.720029	56	443.95	.647335	56	384.77	.585196
58	523.25	.718711	58	442.81	.646221	58	383.91	.584233
60	521.67	2.717397	60	441.68	2.645111	60	383.06	2.583272

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TABLE XXXIV.—*Radii and their logarithms*—Continued

Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.	Deg. D.	Radius R.	Log. R.
° ′			° ′			° ′		
15 0	383.06	2.583272	20 0	287.94	2.459300	30 0	193.19	2.285974
5	380.96	580880	10	285.58	455733	10	192.14	283623
10	378.88	578501	20	283.27	452195	20	191.11	281286
15	376.82	576135	30	280.99	448688	30	190.09	278963
20	374.79	573783	40	278.75	445209	40	189.08	276652
25	372.77	571443	50	276.54	441759	50	188.09	274355
30	370.78	2.569116	21 0	274.37	2.438337	31 0	187.10	2,272071
35	368.81	566802	10	272.23	434943	10	186.12	269800
40	366.86	564500	20	270.13	431575	20	185.16	267541
45	364.93	562210	30	268.06	428235	30	184.20	265295
50	363.02	559933	40	266.02	424921	40	183.26	263062
55	361.13	557668	50	264.02	421633	50	182.32	260841
16 0	359.26	2.555415	22 0	262.04	2.418371	32 0	181.40	2.258632
5	357.42	553173	10	260.10	415134	10	180.48	256435
10	355.59	550944	20	258.18	411922	20	179.58	254250
15	353.77	548726	30	256.29	408734	30	178.68	252077
20	351.98	546519	40	254.43	405571	40	177.79	249916
25	350.21	544324	50	252.60	402431	50	176.92	247766
30	348.45	2.542140	23 0	250.79	2.399315	33 0	176.05	2.245628
35	346.71	539968	10	249.01	396222	10	175.19	243501
40	344.99	537806	20	247.26	393151	20	174.34	241386
45	343.29	535655	30	245.53	390103	30	173.49	239282
50	341.60	533516	40	243.82	387077	40	172.66	237188
55	339.93	531386	50	242.14	384073	50	171.83	235106
17 0	338.27	2.529268	24 0	240.49	2.381091	34 0	171.02	2.233035
5	336.64	527160	10	238.85	378130	10	170.21	230974
10	335.01	525062	20	237.24	375190	20	169.40	228924
15	333.41	522975	30	235.65	372270	30	168.61	226884
20	331.82	520898	40	234.08	369371	40	167.82	224855
25	330.24	518831	50	232.54	366492	50	167.05	222837
30	328.68	2.516774	25 0	231.01	2.363633	35 0	166.28	2.220828
35	327.13	514727	10	229.51	360794	10	165.51	218830
40	325.60	512690	20	228.02	357974	20	164.76	216842
45	324.09	510662	30	226.55	355173	30	164.01	214863
50	322.59	508645	40	225.11	352391	40	163.27	212895
55	321.10	506636	50	223.68	349627	50	162.53	210937
18 0	319.62	2.504638	26 0	222.27	2.346882	36 0	161.80	2.208988
5	318.16	502648	10	220.88	344155	10	161.08	207048
10	316.71	500668	20	219.51	341446	20	160.37	205119
15	315.28	498697	30	218.15	338755	30	159.66	203198
20	313.86	496736	40	216.81	336081	40	158.96	201288
25	312.45	494783	50	215.49	333424	50	158.27	199386
30	311.06	2.492839	27 0	214.18	2.330785	37 0	157.58	2.197494
35	309.67	490904	10	212.89	328162	10	156.90	195610
40	308.30	488978	20	211.62	325556	20	156.22	193736
45	306.95	487061	30	210.36	322967	30	155.55	191871
50	305.60	485152	40	209.12	320393	40	154.89	190014
55	304.27	483252	50	207.89	317836	50	154.23	188167
19 0	302.94	2.481361	28 0	206.68	2.315295	38 0	153.58	2.186328
5	301.63	479478	10	205.48	312769	10	152.93	184498
10	300.33	477603	20	204.30	310259	20	152.29	182676
15	299.04	475736	30	203.13	307764	30	151.66	180863
20	297.77	473878	40	201.97	305285	40	151.03	179059
25	296.50	472028	50	200.83	302820	50	150.41	177263
30	295.25	2.470186	29 0	199.70	2.300370	39 0	149.79	2.175475
35	294.00	468352	10	198.58	297935	10	149.17	173695
40	292.77	466526	20	197.48	295515	20	148.57	171924
45	291.55	464708	30	196.38	293108	30	147.97	170160
50	290.33	462897	40	195.31	290716	40	147.37	168405
55	289.13	461095	50	194.24	288338	50	146.78	166658
60	287.94	2.459300	60	193.19	2.285974	60	146.19	2.164918

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TABLE XXXV

TANGENT OFFSETS AND MIDDLE ORDINATES

Values are given for chords of 100 feet. (100 sin ½ D). The tangent offset for a subchord (less than 100 feet) is obtained from the general formula:

$$a = a_{100} \frac{c^2}{100^2}$$

where c = The length of the subchord;
a = The tangent offset for c;
a_{100} = The tangent offset for chord of 100 feet.

The middle ordinate is the perpendicular distance from the mid-point of the 100-foot chord to the arc.

Deg.	Tan. offs.	Mid. ord.	Deg.	Tan. offs.	Mid. ord.	Deg.	Tan. offs.	Mid. ord.
° ′			° ′			° ′		
0 0	0.000	0.000	2 0	1.745	0.436	4 0	3.490	0.873
2	.029	.007	2	.774	.444	2	.519	.880
4	.058	.015	4	.803	.451	4	.548	.887
6	.087	.022	6	.832	.458	6	.577	.895
8	.116	.029	8	.862	.465	8	.606	.902
10	.145	.036	10	1.891	.473	10	3.635	.909
12	.175	.044	12	.920	.480	12	.664	.916
14	.204	.051	14	.949	.487	14	.693	.924
16	.233	.058	16	.978	.495	16	.723	.931
18	.262	.065	18	2.007	.502	18	.752	.938
20	.291	.073	20	2.036	.509	20	3.781	.945
22	.320	.080	22	.065	.516	22	.810	.953
24	.349	.087	24	.094	.524	24	.839	.960
26	.378	.095	26	.123	.531	26	.868	.967
28	.407	.102	28	.152	.538	28	.897	.975
30	.436	.109	30	2.181	.545	30	3.926	.982
32	.465	.116	32	.211	.553	32	.955	.989
34	.495	.124	34	.240	.560	34	.984	.996
36	.524	.131	36	.269	.567	36	4.013	1.004
38	.553	.138	38	.298	.575	38	.042	.011
40	.582	.145	40	2.327	.582	40	4.071	1.018
42	.611	.153	42	.356	.589	42	.100	.026
44	.640	.160	44	.385	.596	44	.129	.033
46	.669	.167	46	.414	.604	46	.159	.040
48	.698	.175	48	.443	.611	48	.188	.047
50	.727	.182	50	2.472	.618	50	4.217	1.055
52	.756	.189	52	.501	.625	52	.246	.062
54	.785	.196	54	.530	.633	54	.275	.069
56	.814	.204	56	.560	.640	56	.304	.076
58	.844	.211	58	.589	.647	58	.333	.084
1 0	.873	.218	3 0	2.618	.655	5 0	4.362	1.091
2	.902	.225	2	.647	.662	2	.391	.098
4	.931	.233	4	.676	.669	4	.420	.106
6	.960	.240	6	.705	.676	6	.449	.113
8	.989	.247	8	.734	.684	8	.478	.120
10	1.018	.255	10	2.763	.691	10	4.507	1.127
12	.047	.262	12	.792	.698	12	.536	.135
14	.076	.269	14	.821	.705	14	.565	.142
16	.105	.276	16	.850	.713	16	.594	.149
18	.134	.284	18	.879	.720	18	.623	.156
20	1.164	.291	20	2.908	.727	20	4.653	1.164
22	.193	.298	22	.938	.735	22	.682	.171
24	.222	.305	24	.967	.742	24	.711	.178
26	.251	.313	26	.996	.749	26	.740	.186
28	.280	.320	28	3.025	.756	28	.769	.193
30	1.309	.327	30	3.054	.764	30	4.798	1.200
32	.338	.335	32	.083	.771	32	.827	.207
34	.367	.342	34	.112	.778	34	.856	.215
36	.396	.349	36	.141	.785	36	.885	.222
38	.425	.356	38	.170	.793	38	.914	.229
40	1.454	.364	40	3.199	.800	40	4.943	1.237
42	.483	.371	42	.228	.807	42	.972	.244
44	.513	.378	44	.257	.815	44	5.001	.251
46	.542	.385	46	.286	.822	46	.030	.258
48	.571	.393	48	.316	.829	48	.059	.266
50	1.600	.400	50	3.345	.836	50	5.088	1.273
52	.629	.407	52	.374	.844	52	.117	.280
54	.658	.415	54	.403	.851	54	.146	.287
56	.687	.422	56	.432	.858	56	.175	.295
58	.716	.429	58	.461	.865	58	.205	.302

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TABLE XXXV.—*Tangent offsets and middle ordinates*—Continued

Deg.	Tan. offs.	Mid. ord.	Deg.	Tan. offs.	Mid. ord.	Deg.	Tan. offs.	Mid. ord.
° ′			° ′			° ′		
6 0	5.234	1.309	16 0	13.917	3.496	26 0	22.495	5.697
10	.379	.346	10	14.061	.533	10	.637	.734
20	.524	.382	20	.205	.569	20	.778	.770
30	.669	.418	30	.349	.606	30	.920	.807
40	.814	.455	40	.493	.643	40	23.062	.844
50	.960	.491	50	.637	.679	50	.203	.881
7 0	6.105	1.528	17 0	14.781	3.716	27 0	23.345	5.918
10	.250	.564	10	.925	.752	10	.486	.955
20	.395	.600	20	15.069	.789	20	.627	.992
30	.540	.637	30	.212	.825	30	.769	6.029
40	.685	.673	40	.356	.862	40	.910	.065
50	.831	.710	50	.500	.899	50	24.051	.102
8 0	6.976	1.746	18 0	15.643	3.935	28 0	24.192	6.139
10	7.121	.782	10	.787	.972	10	.333	.176
20	.266	.819	20	.931	4.008	20	.474	.213
30	.411	.855	30	16.074	.045	30	.615	.250
40	.556	.892	40	.218	.081	40	.756	.287
50	.701	.928	50	.361	.118	50	.897	.324
9 0	7.846	1.965	19 0	16.505	4.155	29 0	25.038	6.361
10	.991	2.001	10	.648	.191	10	.179	.398
20	8.136	.037	20	.792	.228	20	.320	.435
30	.281	.074	30	.935	.265	30	.460	.472
40	.426	.110	40	17.078	.301	40	.601	.509
50	.571	.147	50	.222	.338	50	.741	.546
10 0	8.716	2.183	20 0	17.365	4.374	30 0	25.882	6.583
10	.860	.219	10	.508	.411	10	26.022	.620
20	9.005	.256	20	.651	.448	20	.163	.657
30	.150	.292	30	.794	.484	30	.303	.694
40	.295	.329	40	.937	.521	40	.443	.731
50	.440	.365	50	18.081	.558	50	.584	.768
11 0	9.585	2.402	21 0	18.224	4.594	31 0	26.724	6.805
10	.729	.438	10	.367	.631	20	27.004	.879
20	.874	.475	20	.509	.668	40	.284	.953
30	10.019	.511	30	.652	.704	32 0	.564	7.027
40	.164	.547	40	.795	.741	20	.843	.101
50	.308	.584	50	.938	.778	40	28.123	.175
12 0	10.453	2.620	22 0	19.081	4.814	33 0	28.402	7.250
10	.597	.657	10	.224	.851	20	.680	.324
20	.742	.693	20	.366	.888	40	.959	.398
30	.887	.730	30	.509	.925	34 0	29.237	.473
40	11.031	.766	40	.652	.961	20	.515	.547
50	.176	.803	50	.794	.998	40	.793	.621
13 0	11.320	2.839	23 0	19.937	5.035	35 0	30.071	7.696
10	.465	.876	10	20.079	.071	20	.348	.770
20	.609	.912	20	.222	.108	40	.625	.845
30	.754	.949	30	.364	.145	36 0	.902	.919
40	.898	.985	40	.507	.182	20	31.178	.994
50	12.043	3.022	50	.649	.218	40	.454	8.068
14 0	12.187	3.058	24 0	20.791	5.255	37 0	31.730	8.143
10	.331	.095	10	.933	.292	20	32.006	.218
20	.476	.131	20	21.076	.329	40	.282	.292
30	.620	.168	30	.218	.366	38 0	.557	.367
40	.764	.204	40	.360	.402	20	.832	.442
50	.908	.241	50	.502	.439	40	33.106	.517
15 0	13.053	3.277	25 0	21.644	5.476	39 0	33.381	8.592
10	.197	.314	10	.786	.513	20	.655	.667
20	.341	.350	20	.928	.549	40	.929	.741
30	.485	.387	30	22.070	.586	40 0	34.202	.816
40	.629	.423	40	.212	.623	20	.475	.891
50	.773	.460	50	.353	.660	40	.748	.966
60	13.917	3.496	60	22.495	5.697	41 0	35.021	9.041

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TABLE XXXVI

TANGENTS AND EXTERNALS FOR 1° CURVES

The intersection angle is given in the left hand column of each series of 3 columns. Opposite that angle are found the tangent distance and external distance for 1° curve. To find the tangent and external for any degree of curvature other than 1°, divide the tabular values by the given degree of curvature. Results are approximate and must be corrected by the use of table XXXVII.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
° ′			° ′			° ′		
1 0	50.00	.22	11 0	551.70	26.50	21 0	1061.9	97.57
10	58.34	.30	10	560.11	27.31	10	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2 0	100.01	.87	12 0	602.21	31.56	22 0	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3 0	150.04	1.96	13 0	652.81	37.07	23 0	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4 0	200.08	3.49	14 0	703.51	43.03	24 0	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5 0	250.16	5.46	15 0	754.32	49.44	25 0	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.82	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6 0	300.28	7.86	16 0	805.25	56.31	26 0	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7 0	350.44	10.71	17 0	856.30	63.63	27 0	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8 0	400.66	13.99	18 0	907.49	71.42	28 0	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.87	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9 0	450.93	17.72	19 0	958.81	79.67	29 0	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10 0	501.28	21.89	20 0	1010.3	88.39	30 0	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

234592°—40——15

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TABLE XXXVI.—*Tangents and externals for 1° curves*—Continued

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
° ′			° ′			° ′		
31 0	1589.0	216.3	41 0	2142.2	387.4	51 0	2732.9	618.4
10	1598.0	218.7	10	2151.7	390.7	10	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32 0	1643.0	230.9	42 0	2199.4	407.6	52 0	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.5	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33 0	1697.2	246.1	43 0	2257.0	428.5	53 0	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34 0	1751.7	261.8	44 0	2314.9	450.0	54 0	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35 0	1806.6	278.1	45 0	2373.3	472.1	55 0	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.4	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36 0	1861.7	294.9	46 0	2432.1	494.8	56 0	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37 0	1917.1	312.2	47 0	2491.3	518.2	57 0	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38 0	1972.9	330.2	48 0	2551.0	542.2	58 0	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39 0	2029.0	348.6	49 0	2611.2	566.9	59 0	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
4	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.7	588.0	50	3296.9	880.8
40 0	2085.4	367.7	50 0	2671.8	592.3	60 0	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

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TABLE XXXVI.—*Tangents and externals for 1° curves*—Continued

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
° ′			° ′			° ′		
61 0	3375.0	920.2	71 0	4086.9	1308.2	81 0	4893.6	1805.3
10	3386.3	925.9	10	4099.5	1315.6	10	4908.0	1814.7
20	3397.5	931.6	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62 0	3442.7	954.8	72 0	4162.8	1352.6	82 0	4980.7	1862.2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881.5
30	3476.8	972.4	30	4201.2	1375.2	30	5024.8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900.9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63 0	3511.1	990.2	73 0	4239.7	1398.0	83 0	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265.6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64 0	3580.3	1026.6	74 0	4317.6	1444.6	84 0	5159.0	1980.4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174.1	1990.5
20	3603.5	1039.0	20	4343.8	1460.4	20	5189.3	2000.6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219.7	2021.1
50	3638.5	1057.7	50	4383.3	1484.4	50	5234.9	2031.4
65 0	3650.2	1063.9	75 0	4396.5	1492.4	85 0	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311.9	2083.5
50	3709.0	1095.7	50	4463.1	1533.1	50	5327.4	2094.1
66 0	3720.9	1102.2	76 0	4476.5	1541.4	86 0	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358.6	2115.3
20	3744.6	1115.1	20	4503.4	1558.0	20	5374.2	2126.0
30	3736.5	1121.7	30	4516.9	1566.3	30	5389.9	2136.7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67 0	3792.4	1141.4	77 0	4557.6	1591.6	87 0	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598.5	1617.1	30	5484.9	2202.2
40	3840.5	1168.1	40	4612.2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68 0	3864.7	1181.6	78 0	4639.8	1643.0	88 0	5533.1	2235.5
10	3876.8	1188.4	10	4653.6	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69 0	3937.9	1222.7	79 0	4723.2	1695.8	89 0	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70 0	4011.9	1265.0	80 0	4807.7	1749.9	90 0	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

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TABLE XXXVI.—*Tangents and externals for 1° curves*—Continued

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
° ′			° ′			° ′		
91 0	5830.5	2444.9	101 0	6950.6	3278.1	111 0	8336.7	4386.1
10	5847.5	2457.1	10	6971.3	3294.1	10	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92 0	5933.2	2518.5	102 0	7075.5	3374.9	112 0	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93 0	6037.8	2594.0	103 0	7203.2	3474.4	113 0	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94 0	6144.3	2671.6	104 0	7333.6	3576.8	114 0	8822.9	4790.4
10	6162.2	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95 0	6252.8	2751.3	105 0	7467.0	3682.3	115 0	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96 0	6363.4	2833.2	106 0	7603.5	3791.0	116 0	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97 0	6476.2	2917.3	107 0	7743.2	3902.9	117 0	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98 0	6591.2	3003.8	108 0	7886.2	4018.2	118 0	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99 0	6708.6	3092.7	109 0	8032.7	4137.1	119 0	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	6808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100 0	6828.3	3184.1	110 0	8182.8	4259.7	120 0	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

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TABLE XXXVII

CORRECTIONS FOR TANGENTS AND EXTERNALS

For degrees of curvature other than 1°, proceed as follows:

Take from table XXXVI the value corresponding to the given intersection angle. Divide this value by the given degree of curvature. Add the correction derived from the following table.

Example: Find the tangent for a 9° curve and intersection angle of 60° 48′. From table XXXVI, by interpolation, we find the length of tangent to be 3361.6. From the following table, interpolating between values for 5° curve and 10° curve and between values for angles of 60° and 70°, we derive a correction, for tangent of .38.

3361.6÷9= 373. 51
Correction= . 38

Tangent for 9° curve 373. 89

Angle	For tangents add—					
	5° cur.	10° cur.	15° cur.	20° cur.	25° cur.	30° cur.
°						
10	.03	.06	.09	.13	.16	.19
20	.06	.13	.19	.26	.32	.39
30	.10	.19	.29	.39	.49	.59
40	.13	.26	.40	.53	.67	.80
50	.17	.34	.51	.68	.85	1.02
60	.21	.42	.63	.84	1.05	1.27
70	.25	.51	.76	1.02	1.28	1.54
80	.30	.61	.91	1.22	1.53	1.84
90	.36	.72	1.09	1.45	1.83	2.20
100	.43	.86	1.30	1.74	2.18	2.62
110	.51	1.03	1.56	2.08	2.61	3.14
120	.62	1.25	1.93	2.52	3.16	3.81

Angle	For externals add—					
	5° cur.	10° cur.	15° cur.	20° cur.	25° cur.	30° cur.
°						
10	.001	.003	.004	.006	.007	.008
20	.006	.011	.017	.022	.028	.034
30	.013	.025	.038	.051	.065	.078
40	.023	.046	.070	.093	.117	.141
50	.037	.075	.116	.151	.189	.227
60	.056	.112	.168	.225	.283	.340
70	.080	.159	.240	.321	.403	.485
80	.110	.220	.332	.445	.558	.671
90	.149	.299	.450	.603	.756	.910
100	.200	.401	.604	.809	1.015	1.221
110	.268	.536	.806	1.082	1.355	1.633
120	.360	.721	1.086	1.456	1.825	2.197

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TABLE XXXVIII

LONG CHORDS AND ACTUAL ARCS

The actual length of arc for a 100-foot chord is given for various degrees of curve; also, the length of the long chord (i. e., distance along a straight line from the point of curvature to the point of tangency) for any number of stations, up to 8, on simple curves.

Degree of curve	Actual arc, 1 station	Long chords							Degree of curve
		2 sta.	3 sta.	4 sta.	5 sta.	6 sta.	7 sta.	8 sta.	
° ′									° ′
0 10	100.000	200.0	300.0	400.0	500.0	600.0	700.0	800.0	0 10
20	000	00.0	00.0	00.0	00.0	00.0	00.0	799.9	20
30	000	00.0	00.0	00.0	00.0	599.9	699.9	99.8	30
40	001	00.0	00.0	00.0	499.9	99.9	99.8	99.7	40
50	001	00.0	00.0	399.9	99.9	99.8	99.7	99.6	50
1 0	100.001	200.0	300.0	399.9	499.8	599.7	699.6	799.4	1 0
10	002	00.0	00.0	99.9	99.8	99.6	99.4	99.1	10
20	002	00.0	299.9	99.9	99.7	99.5	99.2	98.9	20
30	003	00.0	99.9	99.8	99.7	99.4	99.0	98.6	30
40	004	00.0	99.9	99.8	99.6	99.3	98.8	98.2	40
50	004	00.0	99.9	99.7	99.5	99.1	98.6	97.9	50
2 0	100.005	200.0	299.9	399.7	499.4	598.9	698.3	797.4	2 0
10	006	00.0	99.9	99.6	99.3	98.7	98.0	97.0	10
20	007	00.0	99.8	99.6	99.2	98.5	97.7	96.5	20
30	008	00.0	99.8	99.5	99.0	98.3	97.3	96.0	30
40	009	199.9	99.8	99.5	98.9	98.1	97.0	95.5	40
50	010	99.9	99.8	99.4	98.8	97.9	96.6	94.9	50
3 0	100.011	199.9	299.7	399.3	498.6	597.6	696.2	794.3	3 0
10	013	99.9	99.7	99.2	98.5	97.3	95.7	93.6	10
20	014	99.9	99.7	99.2	98.3	97.0	95.3	92.9	20
30	016	99.9	99.6	99.1	98.1	96.7	94.8	92.2	30
40	017	99.9	99.6	99.0	98.0	96.4	94.3	91.4	40
50	019	99.9	99.6	98.9	97.8	96.1	93.7	90.6	50
4 0	100.020	199.9	299.5	398.8	497.6	595.7	693.2	789.8	4 0
10	022	99.9	99.5	98.7	97.4	95.4	92.6	88.9	10
20	024	99.9	99.4	98.6	97.1	95.0	92.0	88.0	20
30	026	99.8	99.4	98.5	96.9	94.6	91.4	87.1	30
40	028	99.8	99.3	98.3	96.7	94.2	90.7	86.1	40
50	030	99.8	99.3	98.2	96.4	93.8	90.1	85.1	50
5 0	100.032	199.8	299.2	398.1	496.2	593.4	689.4	784.1	5 0
10	034	99.8	99.2	98.0	95.9	92.9	88.7	83.0	10
20	036	99.8	99.1	97.8	95.7	92.4	87.9	81.9	20
30	038	99.8	99.1	97.7	95.4	92.0	87.2	80.8	30
40	041	99.8	99.0	97.6	95.1	91.5	86.4	79.6	40
50	043	99.7	99.0	97.4	94.8	91.0	85.6	78.4	50
6 0	100.046	199.7	298.9	397.3	494.5	590.4	684.7	777.2	6 0
10	048	99.7	98.8	97.1	94.2	89.9	83.9	75.9	10
20	051	99.7	98.8	97.0	93.9	89.4	83.0	74.6	20
30	054	99.7	98.7	96.8	93.6	88.8	82.1	73.2	30
40	056	99.7	98.6	96.6	93.3	88.2	81.2	71.9	40
50	059	99.6	98.6	96.5	92.9	87.6	80.3	70.5	50
7 0	100.062	199.6	298.5	396.3	492.6	587.0	679.3	769.0	7 0
10	065	99.6	98.4	96.1	92.2	86.4	78.3	67.5	10
20	068	99.6	98.4	95.9	91.8	85.8	77.3	66.0	20
30	071	99.6	98.3	95.7	91.5	85.1	76.3	64.5	30
40	075	99.6	98.2	95.5	91.1	84.5	75.2	62.9	40
50	078	99.5	98.1	95.3	90.7	83.8	74.1	61.3	50
8 0	100.081	199.5	298.1	395.1	490.3	583.1	673.0	759.7	8 0
10	085	99.5	98.0	94.9	89.9	82.4	71.9	58.0	10
20	088	99.5	97.9	94.7	89.5	81.7	70.7	56.3	20
30	092	99.5	97.8	94.5	89.1	80.9	69.6	54.6	30
40	095	99.4	97.7	94.3	88.6	80.2	68.4	52.8	40
50	099	99.4	97.6	94.1	88.2	79.4	67.2	51.0	50
9 0	100.103	199.4	297.5	393.9	487.7	578.6	666.0	749.2	9 0
10	107	99.4	97.4	93.6	87.3	77.8	64.7	47.3	10
20	111	99.3	97.4	93.4	86.8	77.0	63.4	45.4	20
30	115	99.3	97.3	93.2	86.4	76.2	62.1	43.5	30
40	119	99.3	97.2	92.9	85.9	75.4	60.8	41.5	40
50	123	99.3	97.1	92.7	85.4	74.5	59.5	39.5	50
10 0	100.127	199.2	297.0	392.4	484.9	573.7	658.1	737.5	10 0
Degree	Actual arc	2 sta.	3 sta.	4 sta.	5 sta.	6 sta.	7 sta.	8 sta.	Degree

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TABLE XXXVIII.—*Long chords and actual arcs*—Continued

Degree of curve	Actual arc, 1 station	Long chords							Degree of curve
		2 sta.	3 sta.	4 sta.	5 sta.	6 sta.	7 sta.	8 sta.	
° ′									° ′
10 0	100.127	199.2	297.0	392.4	484.9	573.7	658.1	737.5	10 0
10	131	99.2	96.9	92.2	84.4	72.8	56.7	35.5	10
20	136	99.2	96.8	91.9	83.9	71.9	55.3	33.4	20
30	140	99.2	96.7	91.7	83.4	71.0	53.9	31.3	30
40	145	99.1	96.5	91.4	82.8	70.1	52.4	29.1	40
50	149	99.1	96.4	91.1	82.3	69.2	51.0	27.0	50
11 0	100.154	199.1	296.3	390.8	481.8	568.2	649.5	724.8	11 0
10	158	99.1	96.2	90.6	81.2	67.3	48.0	22.5	10
20	163	99.0	96.1	90.3	80.7	66.3	46.5	20.3	20
30	168	99.0	96.0	90.0	80.1	65.3	44.9	18.0	30
40	173	99.0	95.9	89.7	79.5	64.3	43.3	15.7	40
50	178	98.9	95.7	89.4	78.9	63.3	41.8	13.3	50
12 0	100.183	198.9	295.6	389.1	478.3	562.3	640.1	710.9	12 0
10	188	98.9	95.5	88.8	77.7	61.3	38.5	08.5	10
20	193	98.8	95.4	88.5	77.1	60.2	36.9	06.1	20
30	199	98.8	95.3	88.2	76.5	59.2	35.2	03.7	30
40	204	98.8	95.1	87.9	75.9	58.1	33.5	01.2	40
50	209	98.7	95.0	87.6	75.3	57.0	31.8	698.6	50
13 0	100.215	198.7	294.9	387.2	474.6	555.9	630.1	696.1	13 0
10	220	98.7	94.7	86.9	74.0	54.8	28.3	93.5	10
20	226	98.6	94.6	86.6	73.3	53.7	26.5	90.9	20
30	232	98.6	94.5	86.3	72.7	52.5	24.8	88.3	30
40	237	98.6	94.3	85.9	72.0	51.4	22.9	85.7	40
50	243	98.5	94.2	85.6	71.3	50.2	21.1	83.0	50
14 0	100.249	198.5	294.1	385.2	470.6	549.1	619.3	680.3	14 0
10	255	98.5	93.9	84.9	70.0	47.9	17.4	77.5	10
20	261	98.4	93.8	84.5	69.3	46.7	15.5	74.8	20
30	267	98.4	93.6	84.2	68.6	45.5	13.6	72.0	30
40	274	98.4	93.5	83.8	67.8	44.2	11.7	69.2	40
50	280	98.3	93.3	83.4	67.1	43.0	09.8	66.3	50
15 0	100.286	198.3	293.2	383.1	466.4	541.7	607.8	663.5	15 0
10	293	98.3	93.0	82.7	65.7	40.5	05.8	60.6	10
20	299	98.2	92.9	82.3	64.9	39.2	03.8	57.7	20
30	306	98.2	92.7	81.9	64.2	37.9	01.8	54.8	30
40	312	98.1	92.6	81.5	63.4	36.6	599.8	51.8	40
50	319	98.1	92.4	81.2	62.6	35.3	97.8	48.8	50
16 0	100.326	198.1	292.3	380.8	461.9	534.0	595.7	645.8	16 0
10	332	98.0	92.1	80.4	61.1	32.6	93.6	42.8	10
20	339	98.0	91.9	80.0	60.3	31.3	91.5	39.7	20
30	346	97.9	91.8	79.6	59.5	29.9	89.4	36.6	30
40	353	97.9	91.6	79.1	58.7	28.6	87.3	33.6	40
50	361	97.8	91.4	78.7	57.9	27.2	85.1	30.4	50
17 0	100.368	197.8	291.3	378.3	457.1	525.8	582.9	627.3	17 0
10	375	97.8	91.1	77.9	56.2	24.4	80.7	24.1	10
20	382	97.7	90.9	77.5	55.4	22.9	78.5	20.9	20
30	390	97.7	90.7	77.0	54.6	21.5	76.3	17.7	30
40	397	97.6	90.6	76.6	53.7	20.1	74.1	14.5	40
50	405	97.6	90.4	76.2	52.9	18.6	71.8	11.2	50
18 0	100.412	197.5	290.2	375.7	452.0	517.2	569.6	608.0	18 0
10	420	97.5	90.0	75.3	51.1	15.7	67.3	04.7	10
20	428	97.4	89.8	74.8	50.4	14.2	65.0	01.3	20
30	436	97.4	89.7	74.4	49.4	12.7	62.7	598.0	30
40	444	97.4	89.5	73.9	48.5	11.2	60.3	94.7	40
50	452	97.3	89.3	73.5	47.6	09.7	58.0	91.3	50
19 0	100.460	197.3	289.1	373.0	446.7	508.1	555.6	587.9	19 0
10	468	97.2	88.9	72.6	45.8	06.6	53.3	84.5	10
20	476	97.2	88.7	72.1	44.9	05.0	50.9	81.0	20
30	484	97.1	88.5	71.6	44.0	03.5	48.5	77.6	30
40	493	97.1	88.3	71.1	43.0	01.9	46.0	74.1	40
50	501	97.0	88.1	70.7	42.1	00.3	43.6	70.6	50
20 0	100.510	197.0	287.9	370.2	441.1	498.7	541.1	567.1	20 0
Degree	Actual arc	2 sta.	3 sta.	4 sta.	5 sta.	6 sta.	7 sta.	8 sta.	Degree

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TABLE XXXIX

CORRECTIONS FOR SUBCHORD LENGTHS

For setting stakes for sharp curves it is often necessary to use chord lengths less than 100 feet. The most common chord lengths are 50, 25, 20, and 10 feet, in order as the degree of curvature increases. Common and accepted practice prescribes that the length of a curve be measured in chords 100 feet long and fractions thereof. The arc of a curve corresponding to a 100-foot chord is greater than 100 feet. Similarly the sum of 2, 4, 5, or 10 equal subchords which subtend the arc measured by a 100-foot chord is greater than 100 feet. The nominal lengths of these subchords are 50, 25, 20, or 10 feet, respectively. To these nominal lengths add the corrections shown in the table to give the actual lengths of the subchords. *Example:* Suppose it is desirable to set stakes by subchords of 25-foot nominal length on a 20° curve. Enter the table for $D=20°$. On this line, in the column headed 25, is found the correction .119. To 25 add .119. This gives 25.119 feet as the actual length of the subchord whose nominal length is 25 feet.

D.	50′	25′	20′	10′	D.	50′	25′	20′	10′
°					°				
3	.004	.003	.002	.001	27	.349	.218	.179	.092
4	.008	.005	.004	.002	28	.376	.235	.192	.099
5	.012	.008	.006	.003	29	.403	.252	.206	.106
6	.017	.011	.009	.005	30	.431	.270	.221	.114
7	.023	.015	.012	.006	31	.461	.288	.236	.122
8	.030	.019	.016	.008	32	.491	.307	.252	.130
9	.039	.024	.020	.010	33	.523	.327	.268	.138
10	.048	.030	.024	.013	34	.555	.347	.285	.147
11	.058	.036	.030	.015	35	.589	.368	.302	.156
12	.069	.043	.035	.018	36	.623	.390	.320	.165
13	.081	.050	.041	.021	37	.659	.412	.338	.174
14	.093	.058	.048	.025	38	.695	.435	.356	.184
15	.107	.067	.055	.028	39	.733	.458	.376	.194
16	.122	.076	.063	.032	40	.771	.483	.396	.204
17	.138	.086	.071	.036	41	.811	.507	.416	.214
18	.155	.097	.079	.041	42	.851	.533	.437	.225
19	.172	.108	.088	.045	43	.893	.559	.458	.236
20	.191	.119	.098	.050	44	.936	.586	.480	.248
21	.211	.132	.108	.056	45	.980	.613	.502	.259
22	.231	.144	.118	.061	46	1.024	.641	.525	.271
23	.253	.158	.130	.067	47	1.070	.670	.549	.283
24	.275	.172	.141	.073	48	1.117	.699	.573	.296
25	.299	.187	.153	.079	49	1.165	.729	.598	.308
26	.323	.202	.166	.085	50	1.214	.760	.623	.321

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TABLE XL

CIRCLES

(Diameters are given in units and tenths)

Dia.	Circumf.	Area	Dia.	Circumf.	Area	Dia.	Circumf.	Area
0.1	0.314159	0.007854	6.0	18.84956	28.27433	12.0	37.69911	113.0973
.2	.628319	.031416	.1	19.16372	29.22467	.1	38.01327	114.9901
.3	.942478	.070686	.2	19.47787	30.19071	.2	38.32743	116.8987
.4	1.256637	.125664	.3	19.79203	31.17245	.3	38.64159	118.8229
.5	1.570796	.196350	.4	20.10619	32.16991	.4	38.95575	120.7628
.6	1.884956	.282743	.5	20.42035	33.18307	.5	39.26991	122.7185
.7	2.199115	.384845	.6	20.73451	34.21194	.6	39.58407	124.6898
.8	2.513274	.502655	.7	21.04867	35.25652	.7	39.89823	126.6769
.9	2.827433	.636173	.8	21.36283	36.31681	.8	40.21239	128.6796
1.0	3.141593	.785398	.9	21.67699	37.39281	.9	40.52655	130.6981
.1	3.455752	.950332	7.0	21.99115	38.48451	13.0	40.84070	132.7323
.2	3.769911	1.13097	.1	22.30531	39.59192	.1	41.15486	134.7822
.3	4.084070	1.32732	.2	22.61947	40.71504	.2	41.46902	136.8478
.4	4.398230	1.53938	.3	22.93363	41.85387	.3	41.78318	138.9291
.5	4.712389	1.76715	.4	23.24779	43.00840	.4	42.09734	141.0261
.6	5.026548	2.01062	.5	23.56194	44.17865	.5	42.41150	143.1388
.7	5.340708	2.26980	.6	23.87610	45.36460	.6	42.72566	145.2672
.8	5.654867	2.54469	.7	24.19026	46.56626	.7	43.03982	147.4114
.9	5.969026	2.83529	.8	24.50442	47.78362	.8	43.35398	149.5712
2.0	6.283185	3.14159	.9	24.81858	49.01670	.9	43.66814	151.7468
.1	6.597345	3.46361	8.0	25.13274	50.26548	14.0	43.98230	153.9380
.2	6.911504	3.80133	.1	25.44690	51.52997	.1	44.29646	156.1450
.3	7.225663	4.15476	.2	25.76106	52.81017	.2	44.61062	158.3677
.4	7.539822	4.52389	.3	26.07522	54.10608	.3	44.92477	160.6061
.5	7.853982	4.90674	.4	26.38938	55.41769	.4	45.23893	162.8602
.6	8.168141	5.30929	.5	26.70354	56.74502	.5	45.55309	165.1300
.7	8.482300	5.72555	.6	27.01770	58.08805	.6	45.86725	167.4155
.8	8.796459	6.15752	.7	27.33186	59.44679	.7	46.18141	169.7167
.9	9.110619	6.60520	.8	27.64602	60.82123	.8	46.49557	172.0336
3.0	9.424778	7.06858	.9	27.96017	62.21139	.9	46.80973	174.3662
.1	9.738937	7.54768	9.0	28.27433	63.61725	15.0	47.12389	176.7146
.2	10.05310	8.04248	.1	28.58849	65.03882	.1	47.43805	179.0786
.3	10.36726	8.55299	.2	28.90265	66.47610	.2	47.75221	181.4584
.4	10.68142	9.07920	.3	29.21681	67.92909	.3	48.06637	183.8539
.5	10.99557	9.62113	.4	29.53097	69.39778	.4	48.38053	186.2650
.6	11.30973	10.17876	.5	29.84513	70.88218	.5	48.69469	188.6919
.7	11.62389	10.75210	.6	30.15929	72.38229	.6	49.00885	191.1345
.8	11.93805	11.34115	.7	30.47345	73.89811	.7	49.32300	193.5928
.9	12.25221	11.94591	.8	30.78761	75.42964	.8	49.63716	196.0668
4.0	12.56637	12.56637	.9	31.10177	76.97687	.9	49.95132	198.5565
.1	12.88053	13.20254	10.0	31.41593	78.53982	16.0	50.26548	201.0619
.2	13.19469	13.85442	.1	31.73009	80.11847	.1	50.57964	203.5831
.3	13.50885	14.52201	.2	32.04425	81.71282	.2	50.89380	206.1199
.4	13.82301	15.20531	.3	32.35840	83.32289	.3	51.20796	208.6724
.5	14.13717	15.90431	.4	32.67256	84.94867	.4	51.52212	211.2407
.6	14.45133	16.61903	.5	32.98672	86.59015	.5	51.83628	213.8246
.7	14.76549	17.34945	.6	33.30088	88.24734	.6	52.15044	216.4243
.8	15.07964	18.09557	.7	33.61504	89.92024	.7	52.46460	219.0397
.9	15.39380	18.85741	.8	33.92920	91.60884	.8	52.77876	221.6708
5.0	15.70796	19.63495	.9	34.24336	93.31316	.9	53.09292	224.3176
.1	16.02212	20.42821	11.0	34.55752	95.03318	17.0	53.40708	226.9801
.2	16.33628	21.23717	.1	34.87168	96.76891	.1	53.72123	229.6583
.3	16.65044	22.06183	.2	35.18584	98.52035	.2	54.03539	232.3522
.4	16.96460	22.90221	.3	35.50000	100.2875	.3	54.34955	235.0618
.5	17.27876	23.75829	.4	35.81416	102.0703	.4	54.66371	237.7871
.6	17.59292	24.63009	.5	36.12832	103.8689	.5	54.97787	240.5282
.7	17.90708	25.51759	.6	36.44247	105.6832	.6	55.29203	243.2849
.8	18.22124	26.42079	.7	36.75663	107.5132	.7	55.60619	246.0574
.9	18.53540	27.33971	.8	37.07079	109.3588	.8	55.92035	248.8456
			.9	37.38495	111.2202	.9	56.23451	251.6494

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TABLE XL.—*Circles*—Continued

Dia.	Circumf.	Area	Dia.	Circumf.	Area	Dia.	Circumf.	Area
18.0	56.54867	254.4690	25.9	81.36725	526.8529	33.8	106.1858	897.2703
.1	56.86283	257.3043	26.0	81.68141	530.9292	.9	106.5000	902.5874
.2	57.17699	260.1553	.1	81.99557	535.0211	34.0	106.8142	907.9203
.3	57.49115	263.0220	.2	82.30973	539.1287	.1	107.1283	913.2688
.4	57.80530	265.9044	.3	82.62389	543.2521	.2	107.4425	918.6331
.5	58.11946	268.8025	.4	82.93805	547.3911	.3	107.7566	924.0131
.6	58.43362	271.7163	.5	83.25221	551.5459	.4	108.0708	929.4088
.7	58.74778	274.6459	.6	83.56636	555.7163	.5	108.3849	934.8202
.8	59.06194	277.5911	.7	83.88052	559.9025	.6	108.6991	940.2473
.9	59.37610	280.5521	.8	84.19468	564.1044	.7	109.0133	945.6901
19.0	59.69026	283.5287	.9	84.50884	568.3220	.8	109.3274	951.1486
.1	60.00442	286.5211	27.0	84.82300	572.5553	.9	109.6416	956.6228
.2	60.31858	289.5292	.1	85.13716	576.8043	35.0	109.9557	962.1128
.3	60.63274	292.5530	.2	85.45132	581.0690	.1	110.2699	967.6184
.4	60.94690	295.5925	.3	85.76548	585.3494	.2	110.5841	973.1397
.5	61.26106	298.6477	.4	86.07964	589.6455	.3	110.8982	978.6768
.6	61.57522	301.7186	.5	86.39380	593.9574	.4	111.2124	984.2296
.7	61.88938	304.8052	.6	86.70796	598.2849	.5	111.5265	989.7980
.8	62.20353	307.9075	.7	87.02212	602.6282	.6	111.8407	995.3822
.9	62.51769	311.0255	.8	87.33628	606.9871	.7	112.1549	1000.9821
20.0	62.83185	314.1593	.9	87.65044	611.3618	.8	112.4690	1006.5977
.1	63.14601	317.3087	28.0	87.96459	615.7522	.9	112.7832	1012.2290
.2	63.46017	320.4739	.1	88.27875	620.1582	36.0	113.0973	1017.8760
.3	63.77433	323.6547	.2	88.59291	624.5800	.1	113.4115	1023.5387
.4	64.08849	326.8513	.3	88.90707	629.0175	.2	113.7257	1029.2172
.5	64.40265	330.0636	.4	89.22123	633.4707	.3	114.0398	1034.9113
.6	64.71681	333.2916	.5	89.53539	637.9397	.4	114.3540	1040.6212
.7	65.03097	336.5353	.6	89.84955	642.4243	.5	114.6681	1046.3467
.8	65.34513	339.7947	.7	90.16371	646.9246	.6	114.9823	1052.0880
.9	65.65929	343.0698	.8	90.47787	651.4407	.7	115.2965	1057.8449
21.0	65.97345	346.3606	.9	90.79203	655.9724	.8	115.6106	1063.6176
.1	66.28760	349.6671	29.0	91.10619	660.5199	.9	115.9248	1069.4060
.2	66.60176	352.9894	.1	91.42035	665.0830	37.0	116.2389	1075.2101
.3	66.91592	356.3273	.2	91.73451	669.6619	.1	116.5531	1081.0299
.4	67.23008	359.6809	.3	92.04866	674.2565	.2	116.8672	1086.8654
.5	67.54424	363.0503	.4	92.36282	678.8668	.3	117.1814	1092.7166
.6	67.85840	366.4354	.5	92.67698	683.4928	.4	117.4956	1098.5835
.7	68.17256	369.8361	.6	92.99114	688.1345	.5	117.8097	1104.4662
.8	68.48672	373.2526	.7	93.30530	692.7919	.6	118.1239	1110.3645
.9	68.80088	376.6848	.8	93.61946	697.4650	.7	118.4380	1116.2786
22.0	69.11504	380.1327	.9	93.93362	702.1538	.8	118.7522	1122.2083
.1	69.42920	383.5963	30.0	94.24778	706.8583	.9	119.0664	1128.1538
.2	69.74336	387.0756	.1	94.56194	711.5786	38.0	119.3805	1134.1149
.3	70.05752	390.5707	.2	94.87610	716.3145	.1	119.6947	1140.0918
.4	70.37168	394.0814	.3	95.19026	721.0662	.2	120.0088	1146.0844
.5	70.68583	397.6078	.4	95.50442	725.8336	.3	120.3230	1152.0927
.6	70.99999	401.1500	.5	95.81858	730.6166	.4	120.6372	1158.1167
.7	71.31415	404.7078	.6	96.13274	735.4154	.5	120.9513	1164.1564
.8	71.62831	408.2814	.7	96.44689	740.2299	.6	121.2655	1170.2118
.9	71.94247	411.8707	.8	96.76105	745.0601	.7	121.5796	1176.2830
23.0	72.25663	415.4756	.9	97.07521	749.9060	.8	121.8938	1182.3698
.1	72.57079	419.0963	31.0	97.38937	754.7676	.9	122.2080	1188.4724
.2	72.88495	422.7327	.1	97.70353	759.6450	39.0	122.5221	1194.5906
.3	73.19911	426.3848	.2	98.01769	764.5380	.1	122.8363	1200.7246
.4	73.51327	430.0526	.3	98.33185	769.4467	.2	123.1504	1206.8742
.5	73.82743	433.7361	.4	98.64601	774.3712	.3	123.4646	1213.0396
.6	74.14159	437.4354	.5	98.96017	779.3113	.4	123.7788	1219.2207
.7	74.45575	441.1503	.6	99.27433	784.2672	.5	124.0929	1225.4175
.8	74.76991	444.8809	.7	99.58849	789.2388	.6	124.4071	1231.6300
.9	75.08406	448.6273	.8	99.90265	794.2260	.7	124.7212	1237.8582
24.0	75.39822	452.3893	.9	100.2168	799.2290	.8	125.0354	1244.1021
.1	75.71238	456.1671	32.0	100.5310	804.2477	.9	125.3495	1250.3617
.2	76.02654	459.9606	.1	100.8451	809.2821	40.0	125.6637	1256.6371
.3	76.34070	463.7698	.2	101.1593	814.3322	.1	125.9779	1262.9281
.4	76.65486	467.5947	.3	101.4734	819.3980	.2	126.2920	1269.2348
.5	76.96902	471.4352	.4	101.7876	824.4796	.3	126.6062	1275.5573
.6	77.28318	475.2916	.5	102.1018	829.5768	.4	126.9203	1281.8955
.7	77.59734	479.1636	.6	102.4159	834.6898	.5	127.2345	1288.2493
.8	77.91150	483.0513	.7	102.7301	839.8184	.6	127.5487	1294.6189
.9	78.22566	486.9547	.8	103.0442	844.9628	.7	127.8628	1301.0042
25.0	78.53982	490.8739	.9	103.3584	850.1228	.8	128.1770	1307.4052
.1	78.85398	494.8087	33.0	103.6726	855.2986	.9	128.4911	1313.8219
.2	79.16813	498.7592	.1	103.9867	860.4901	41.0	128.8053	1320.2543
.3	79.48229	502.7255	.2	104.3009	865.6973	.1	129.1195	1326.7024
.4	79.79645	506.7075	.3	104.6150	870.9202	.2	129.4336	1333.1663
.5	80.11061	510.7052	.4	104.9292	876.1588	.3	129.7478	1339.6458
.6	80.42477	514.7185	.5	105.2434	881.4131	.4	130.0619	1346.1410
.7	80.73893	518.7476	.6	105.5575	886.6831	.5	130.3761	1352.6520
.8	81.05309	522.7924	.7	105.8717	891.9688			

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TABLE XL.—*Circles*—Continued

Dia.	Circumf.	Area	Dia.	Circumf.	Area	Dia.	Circumf.	Area
41.6	130.6903	1359.1786	49.5	155.5088	1924.4218	57.4	180.3274	2587.6985
.7	131.0044	1365.7210	.6	155.8230	1932.2051	.5	180.6416	2596.7227
.8	131.3186	1372.2791	.7	156.1372	1940.0041	.6	180.9557	2605.7626
.9	131.6327	1378.8529	.8	156.4513	1947.8189	.7	181.2699	2614.8183
42.0	131.9469	1385.4424	.9	156.7655	1955.6493	.8	181.5841	2623.8896
.1	132.2611	1392.0476	50.0	157.0796	1963.4954	.9	181.8982	2632.9767
.2	132.5752	1398.6685	.1	157.3938	1971.3572	58.0	182.2124	2642.0794
.3	132.8894	1405.3051	.2	157.7080	1979.2348	.1	182.5265	2651.1979
.4	133.2035	1411.9574	.3	158.0221	1987.1280	.2	182.8407	2660.3321
.5	133.5177	1418.6254	.4	158.3363	1995.0370	.3	183.1549	2669.4820
.6	133.8318	1425.3092	.5	158.6504	2002.9617	.4	183.4690	2678.6476
.7	134.1460	1432.0086	.6	158.9646	2010.9020	.5	183.7832	2687.8289
.8	134.4602	1438.7238	.7	159.2787	2018.8581	.6	184.0973	2697.0259
.9	134.7743	1445.4546	.8	159.5929	2026.8299	.7	184.4115	2706.2386
43.0	135.0885	1452.2012	.9	159.9071	2034.8174	.8	184.7256	2715.4670
.1	135.4026	1458.9635	51.0	160.2212	2042.8206	.9	185.0398	2724.7112
.2	135.7168	1465.7415	.1	160.5354	2050.8395	59.0	185.3540	2733.9710
.3	136.0310	1472.5352	.2	160.8495	2058.8742	.1	185.6681	2743.2466
.4	136.3451	1479.3446	.3	161.1637	2066.9245	.2	185.9823	2752.5378
.5	136.6593	1486.1697	.4	161.4779	2074.9905	.3	186.2964	2761.8448
.6	136.9734	1493.0105	.5	161.7920	2083.0723	.4	186.6106	2771.1675
.7	137.2876	1499.8670	.6	162.1062	2091.1697	.5	186.9248	2780.5058
.8	137.6018	1506.7393	.7	162.4203	2099.2829	.6	187.2389	2789.8599
.9	137.9159	1513.6272	.8	162.7345	2107.4118	.7	187.5531	2799.2297
44.0	138.2301	1520.5308	.9	163.0487	2115.5563	.8	187.8672	2808.6152
.1	138.5442	1527.4502	52.0	163.3628	2123.7166	.9	188.1814	2818.0165
.2	138.8584	1534.3853	.1	163.6770	2131.8926	60.0	188.4956	2827.4334
.3	139.1726	1541.3360	.2	163.9911	2140.0843	.1	188.8097	2836.8660
.4	139.4867	1548.3025	.3	164.3053	2148.2917	.2	189.1239	2846.3144
.5	139.8009	1555.2847	.4	164.6195	2156.5149	.3	189.4380	2855.7784
.6	140.1150	1562.2826	.5	164.9336	2164.7537	.4	189.7522	2865.2582
.7	140.4292	1569.2962	.6	165.2478	2173.0082	.5	190.0664	2874.7536
.8	140.7434	1576.3255	.7	165.5619	2181.2785	.6	190.3805	2884.2648
.9	141.0575	1583.3706	.8	165.8761	2189.5644	.7	190.6947	2893.7917
45.0	141.3717	1590.4313	.9	166.1903	2197.8661	.8	191.0088	2903.3343
.1	141.6858	1597.5077	53.0	166.5044	2206.1834	.9	191.3230	2912.8926
.2	142.0000	1604.5999	.1	166.8186	2214.5165	61.0	191.6372	2922.4666
.3	142.3141	1611.7077	.2	167.1327	2222.8653	.1	191.9513	2932.0563
.4	142.6283	1618.8313	.3	167.4469	2231.2298	.2	192.2655	2941.6617
.5	142.9425	1625.9705	.4	167.7610	2239.6100	.3	192.5796	2951.2828
.6	143.2566	1633.1255	.5	168.0752	2248.0059	.4	192.8938	2960.9197
.7	143.5708	1640.2962	.6	168.3894	2256.4175	.5	193.2079	2970.5722
.8	143.8849	1647.4826	.7	168.7035	2264.8448	.6	193.5221	2980.2405
.9	144.1991	1654.6847	.8	169.0177	2273.2879	.7	193.8363	2989.9244
46.0	144.5133	1661.9025	.9	169.3318	2281.7466	.8	194.1504	2999.6241
.1	144.8274	1669.1360	54.0	169.6460	2290.2210	.9	194.4646	3009.3395
.2	145.1416	1676.3853	.1	169.9602	2298.7112	62.0	194.7787	3019.0705
.3	145.4557	1683.6502	.2	170.2743	2307.2171	.1	195.0929	3028.8173
.4	145.7699	1690.9308	.3	170.5885	2315.7386	.2	195.4071	3038.5798
.5	146.0841	1698.2272	.4	170.9026	2324.2759	.3	195.7212	3048.3580
.6	146.3982	1705.5392	.5	171.2168	2332.8289	.4	196.0354	3058.1520
.7	146.7124	1712.8670	.6	171.5310	2341.3976	.5	196.3495	3067.9616
.8	147.0265	1720.2105	.7	171.8451	2349.9820	.6	196.6637	3077.7869
.9	147.3407	1727.5697	.8	172.1593	2358.5821	.7	196.9779	3087.6279
47.0	147.6549	1734.9445	.9	172.4734	2367.1979	.8	197.2920	3097.4847
.1	147.9690	1742.3351	55.0	172.7876	2375.8294	.9	197.6062	3107.3571
.2	148.2832	1749.7414	.1	173.1018	2384.4767	63.0	197.9203	3117.2453
.3	148.5973	1757.1635	.2	173.4159	2393.1396	.1	198.2345	3127.1492
.4	148.9115	1764.6012	.3	173.7301	2401.8183	.2	198.5487	3137.0688
.5	149.2257	1772.0546	.4	174.0442	2410.5126	.3	198.8628	3147.0040
.6	149.5398	1779.5237	.5	174.3584	2419.2227	.4	199.1770	3156.9550
.7	149.8540	1787.0086	.6	174.6726	2427.9485	.5	199.4911	3166.9217
.8	150.1631	1794.5091	.7	174.9867	2436.6899	.6	199.8053	3176.9042
.9	150.4823	1802.0254	.8	175.3009	2445.4471	.7	200.1195	3186.9023
48.0	150.7964	1809.5574	.9	175.6150	2454.2200	.8	200.4336	3196.9161
.1	151.1106	1817.1050	56.0	175.9292	2463.0086	.9	200.7478	3206.9456
.2	151.4248	1824.6684	.1	176.2433	2471.8130	64.0	201.0619	3216.9909
.3	151.7389	1832.2475	.2	176.5575	2480.6330	.1	201.3761	3227.0518
.4	152.0531	1839.8423	.3	176.8717	2489.4687	.2	201.6902	3237.1285
.5	152.3672	1847.4528	.4	177.1858	2498.3201	.3	202.0044	3247.2209
.6	152.6814	1855.0790	.5	177.5000	2507.1873	.4	202.3186	3257.3289
.7	152.9956	1862.7210	.6	177.8141	2516.0701	.5	202.6327	3267.4527
.8	153.3097	1870.3786	.7	178.1283	2524.9687	.6	202.9469	3277.5922
.9	153.6239	1878.0519	.8	178.4425	2533.8830	.7	203.2610	3287.7474
49.0	153.9380	1885.7410	.9	178.7566	2542.8129	.8	203.5752	3297.9183
.1	154.2522	1893.4457	57.0	179.0708	2551.7586	.9	203.8894	3308.1049
.2	154.5664	1901.1662	.1	179.3849	2560.7200	65.0	204.2035	3318.3072
.3	154.8805	1908.9024	.2	179.6991	2569.6971	.1	204.5177	3328.5253
.4	155.1947	1916.6543	.3	180.0133	2578.6899	.2	204.8318	3338.7590

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TABLE XL.—*Circles*—Continued

Dia.	Circumf.	Area	Dia.	Circumf.	Area	Dia.	Circumf.	Area
65.3	205.1460	3349.0085	73.2	229.9646	4208.3519	81.1	254.7832	5165.7287
.4	205.4602	3359.2736	.3	230.2787	4219.8579	.2	255.0973	5178.4757
.5	205.7743	3369.5545	.4	230.5929	4231.3797	.3	255.4115	5191.2384
.6	206.0885	3379.8510	.5	230.9071	4242.9172	.4	255.7256	5204.0168
.7	206.4026	3390.1633	.6	231.2212	4254.4704	.5	256.0398	5216.8110
.8	206.7168	3400.4913	.7	231.5354	4266.0394	.6	256.3540	5229.6208
.9	207.0310	3410.8350	.8	231.8495	4277.6240	.7	256.6681	5242.4463
66.0	207.3451	3421.1944	.9	232.1637	4289.2243	.8	256.9823	5255.2876
.1	207.6593	3431.5695	74.0	232.4779	4300.8403	.9	257.2964	5268.1446
.2	207.9734	3441.9603	.1	232.7920	4312.4721	82.0	257.6106	5281.0173
.3	208.2876	3452.3669	.2	233.1062	4324.1195	.1	257.9248	5293.9056
.4	208.6018	3462.7891	.3	233.4203	4335.7827	.2	258.2389	5306.8097
.5	208.9159	3473.2270	.4	233.7345	4347.4616	.3	258.5531	5319.7295
.6	209.2301	3483.6807	.5	234.0487	4359.1562	.4	258.8672	5332.6650
.7	209.5442	3494.1500	.6	234.3628	4370.8664	.5	259.1814	5345.6162
.8	209.8584	3504.6351	.7	234.6770	4382.5924	.6	259.4956	5358.5832
.9	210.1725	3515.1359	.8	234.9911	4394.3341	.7	259.8097	5371.5658
67.0	210.4867	3525.6524	.9	235.3053	4406.0916	.8	260.1239	5384.5641
.1	210.8009	3536.1845	75.0	235.6194	4417.8647	.9	260.4380	5397.5782
.2	211.1150	3546.7324	.1	235.9336	4429.6535	83.0	260.7522	5410.6079
.3	211.4292	3557.2960	.2	236.2478	4441.4580	.1	261.0663	5423.6534
.4	211.7433	3567.8754	.3	236.5619	4453.2783	.2	261.3805	5436.7146
.5	212.0575	3578.4704	.4	236.8761	4465.1142	.3	261.6947	5449.7915
.6	212.3717	3589.0811	.5	237.1902	4476.9659	.4	262.0088	5462.8840
.7	212.6858	3599.7075	.6	237.5044	4488.8332	.5	262.3230	5475.9923
.8	213.0000	3610.3497	.7	237.8186	4500.7163	.6	262.6371	5489.1163
.9	213.3141	3621.0075	.8	238.1327	4512.6151	.7	262.9513	5502.2561
68.0	213.6283	3631.6811	.9	238.4469	4524.5296	.8	263.2655	5515.4115
.1	213.9425	3642.3704	76.0	238.7610	4536.4598	.9	263.5796	5528.5826
.2	214.2566	3653.0754	.1	239.0752	4548.4057	84.0	263.8938	5541.7694
.3	214.5708	3663.7960	.2	239.3894	4560.3673	.1	264.2079	5554.9720
.4	214.8849	3674.5324	.3	239.7035	4572.3446	.2	264.5221	5568.1902
.5	215.1991	3685.2845	.4	240.0177	4584.3377	.3	264.8363	5581.4242
.6	215.5133	3696.0523	.5	240.3318	4596.3464	.4	265.1504	5594.6739
.7	215.8274	3706.8359	.6	240.6460	4608.3708	.5	265.4646	5607.9392
.8	216.1416	3717.6351	.7	240.9602	4620.4110	.6	265.7787	5621.2203
.9	216.4557	3728.4500	.8	241.2743	4632.4669	.7	266.0929	5634.5171
69.0	216.7699	3739.2807	.9	241.5885	4644.5384	.8	266.4071	5647.8296
.1	217.0841	3750.1270	77.0	241.9026	4656.6257	.9	266.7212	5661.1578
.2	217.3982	3760.9891	.1	242.2168	4668.7287	85.0	267.0354	5674.5017
.3	217.7124	3771.8668	.2	242.5310	4680.8474	.1	267.3495	5687.8614
.4	218.0265	3782.7603	.3	242.8451	4692.9818	.2	267.6637	5701.2367
.5	218.3407	3793.6695	.4	243.1593	4705.1319	.3	267.9779	5714.6277
.6	218.6548	3804.5944	.5	243.4734	4717.2977	.4	268.2920	5728.0345
.7	218.9690	3815.5350	.6	243.7876	4729.4792	.5	268.6062	5741.4569
.8	219.2832	3826.4913	.7	244.1017	4741.6765	.6	268.9203	5754.8951
.9	219.5973	3837.4633	.8	244.4159	4753.8894	.7	269.2345	5768.3490
70.0	219.9115	3848.4510	.9	244.7301	4766.1181	.8	269.5486	5781.8185
.1	220.2256	3859.4544	78.0	245.0442	4778.3624	.9	269.8628	5795.3038
.2	220.5398	3870.4736	.1	245.3584	4790.6225	86.0	270.1770	5808.8048
.3	220.8540	3881.5084	.2	245.6725	4802.8983	.1	270.4911	5822.3215
.4	221.1681	3892.5590	.3	245.9867	4815.1897	.2	270.8053	5835.8539
.5	221.4823	3903.6252	.4	246.3009	4827.4969	.3	271.1194	5849.4020
.6	221.7964	3914.7072	.5	246.6150	4839.8198	.4	271.4336	5862.9659
.7	222.1106	3925.8049	.6	246.9292	4852.1584	.5	271.7478	5876.5454
.8	222.4248	3936.9182	.7	247.2433	4864.5128	.6	272.0619	5890.1407
.9	222.7389	3948.0473	.8	247.5575	4876.8828	.7	272.3761	5903.7516
71.0	223.0531	3959.1921	.9	247.8717	4889.2685	.8	272.6902	5917.3783
.1	223.3672	3970.3526	79.0	248.1858	4901.6699	.9	273.0044	5931.0206
.2	223.6814	3981.5289	.1	248.5000	4914.0871	87.0	273.3186	5944.6787
.3	223.9956	3992.7208	.2	248.8141	4926.5199	.1	273.6327	5958.3525
.4	224.3097	4003.9284	.3	249.1283	4938.9685	.2	273.9469	5972.0420
.5	224.6239	4015.1518	.4	249.4425	4951.4328	.3	274.2610	5985.7472
.6	224.9380	4026.3908	.5	249.7566	4963.9127	.4	274.5752	5999.4681
.7	225.2522	4037.6456	.6	250.0708	4976.4084	.5	274.8894	6013.2047
.8	225.5664	4048.9160	.7	250.3849	4988.9198	.6	275.2035	6026.9570
.9	225.8805	4060.2022	.8	250.6991	5001.4469	.7	275.5177	6040.7250
72.0	226.1947	4071.5041	.9	251.0133	5013.9897	.8	275.8318	6054.5088
.1	226.5088	4082.8217	80.0	251.3274	5026.5482	.9	276.1460	6068.3082
.2	226.8230	4094.1550	.1	251.6416	5039.1225	88.0	276.4602	6082.1234
.3	227.1371	4105.5040	.2	251.9557	5051.7124	.1	276.7743	6095.9542
.4	227.4513	4116.8687	.3	252.2699	5064.3180	.2	277.0885	6109.8008
.5	227.7655	4128.2491	.4	252.5840	5076.9394	.3	277.4026	6123.6631
.6	228.0796	4139.6452	.5	252.8982	5089.5764	.4	277.7168	6137.5411
.7	228.3938	4151.0571	.6	253.2124	5102.2292	.5	278.0309	6151.4348
.8	228.7079	4162.4846	.7	253.5265	5114.8977	.6	278.3451	6165.3442
.9	229.0221	4173.9279	.8	253.8407	5127.5819	.7	278.6593	6179.2693
73.0	229.3363	4185.3868	.9	254.1548	5140.2818	.8	278.9734	6193.2101
.1	229.6504	4196.8615	81.0	254.4690	5152.9974	.9	279.2876	6207.1666

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TABLE XL.—*Circles*—Continued

Dia.	Circumf.	Area	Dia.	Circumf.	Area	Dia.	Circumf.	Area
89.0	279.6017	6221.1389	92.7	291.2256	6749.1542	96.4	302.8495	7298.6737
.1	279.9159	6235.1268	.8	291.5398	6763.7233	.5	303.1637	7313.8240
.2	280.2301	6249.1304	.9	291.8540	6778.3082	.6	303.4779	7328.9901
.3	280.5442	6263.1498	93.0	292.1681	6792.9087	.7	303.7920	7344.1718
.4	280.8584	6277.1849	.1	292.4823	6807.5250	.8	304.1062	7359.3693
.5	281.1725	6291.2356	.2	292.7964	6822.1569	.9	304.4203	7374.5824
.6	281.4867	6305.3021	.3	293.1106	6836.8046	97.0	304.7345	7389.8113
.7	281.8009	6319.3843	.4	293.4248	6851.4680	.1	305.0486	7405.0559
.8	282.1150	6333.4822	.5	293.7389	6866.1471	.2	305.3628	7420.3162
.9	282.4292	6347.5958	.6	294.0531	6880.8419	.3	305.6770	7435.5922
90.0	282.7433	6361.7251	.7	294.3672	6895.5524	.4	305.9911	7450.8839
.1	283.0575	6375.8701	.8	294.6814	6910.2786	.5	306.3053	7466.1913
.2	283.3717	6390.0309	.9	294.9956	6925.0205	.6	306.6194	7481.5144
.3	283.6858	6404.2073	94.0	295.3097	6939.7782	.7	306.9336	7496.8532
.4	284.0000	6418.3995	.1	295.6239	6954.5515	.8	307.2478	7512.2078
.5	284.3141	6432.6073	.2	295.9380	6969.3406	.9	307.5619	7527.5780
.6	284.6283	6446.8309	.3	296.2522	6984.1453	98.0	307.8761	7542.9640
.7	284.9425	6461.0701	.4	296.5663	6998.9658	.1	308.1902	7558.3656
.8	285.2566	6475.3251	.5	296.8805	7013.8019	.2	308.5044	7573.7830
.9	285.5708	6489.5958	.6	297.1947	7028.6538	.3	308.8186	7589.2161
91.0	285.8849	6503.8822	.7	297.5088	7043.5214	.4	309.1327	7604.6648
.1	286.1991	6518.1843	.8	297.8230	7058.4047	.5	309.4469	7620.1293
.2	286.5133	6532.5021	.9	298.1371	7073.3037	.6	309.7610	7635.6095
.3	286.8274	6546.8356	95.0	298.4513	7088.2184	.7	310.0752	7651.1054
.4	287.1416	6561.1848	.1	298.7655	7103.1488	.8	310.3894	7666.6170
.5	287.4557	6575.5498	.2	299.0796	7118.0950	.9	310.7035	7682.1444
.6	287.7699	6589.9304	.3	299.3938	7133.0568	99.0	311.0177	7697.6874
.7	288.0840	6604.3268	.4	299.7079	7148.0343	.1	311.3318	7713.2461
.8	288.3982	6618.7388	.5	300.0221	7163.0276	.2	311.6460	7728.8206
.9	288.7124	6633.1666	.6	300.3363	7178.0366	.3	311.9602	7744.4107
92.0	289.0265	6647.6101	.7	300.6504	7193.0612	.4	312.2743	7760.0166
.1	289.3407	6662.0692	.8	300.9646	7208.1016	.5	312.5885	7775.6382
.2	289.6548	6676.5441	.9	301.2787	7223.1577	.6	312.9026	7791.2754
.3	289.9690	6691.0347	96.0	301.5929	7238.2295	.7	313.2168	7806.9284
.4	290.2832	6705.5410	.1	301.9071	7253.3170	.8	313.5309	7822.5971
.5	290.5973	6720.0630	.2	302.2212	7268.4202	.9	313.8451	7838.2815
.6	290.9115	6734.6008	.3	302.5354	7283.5391	100.0	314.1593	7853.9816

Circumferences when the diameter has more than one place of decimals

Diam.	Circ.	Diam.	Circ.	Diam.	Circ.	Diam.	Circ.	Diam.	Circ.
.1	.314159	.01	.031416	.001	.003142	.0001	.000314	.00001	.000031
.2	.628319	.02	.062832	.002	.006283	.0002	.000628	.00002	.000063
.3	.942478	.03	.094248	.003	.009425	.0003	.000942	.00003	.000094
.4	1.256637	.04	.125664	.004	.012566	.0004	.001257	.00004	.000126
.5	1.570796	.05	.157080	.005	.015708	.0005	.001571	.00005	.000157
.6	1.884956	.06	.188496	.006	.018850	.0006	.001885	.00006	.000188
.7	2.199115	.07	.219911	.007	.021991	.0007	.002199	.00007	.000220
.8	2.513274	.08	.251327	.008	.025133	.0008	.002513	.00008	.000251
.9	2.827433	.09	.282743	.009	.028274	.0009	.002827	.00009	.000283

Examples

Diameter = 3.12699

Circumference = Sum of

Circ. for dia. of 3.1 = 9.738937
Do . . . . . .02 = .062832
Do . . . . . .006 = .018850
Do . . . . . .0009 = .002827
Do . . . . . .00009 = .000283

9.823729

Circumference = 9.823729

Diameter = Sum of

Dia. for circ. of 9.738937 = 3.1

.084792
Do . . . . . .062832 = .02

.021960
Do . . . . . .018850 = .006

.003110
Do . . . . . .002827 = .0009

.000283
Do . . . . . .000283 = .00009

3.12699

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TABLE XLI

SQUARES, CUBES, SQUARE ROOTS, AND CUBE ROOTS

Example: The square of 26=676; the cube of 26=17,576; the square root of 26=5.0990; the cube root of 26=2.9625.

To find the square root of a decimal fraction or mixed number from this table, multiply by 100 or 10,000 and find the product, or the number nearest the product, in the column of squares. The corresponding number in the first column with a decimal point one or two places to the left, according as the multiplier was 100 or 10,000, is the desired root.

Example:

Find the square root of 5.246 to the first decimal place.

Multiply by 100. Result is 524; the nearest number in the column of squares is 529, which is opposite 23 in the column of numbers.

Move the decimal point one place to the left. This gives 2.3 as the desired root to the first place of decimals.

Find the square root of 5.246 to the second decimal place.

Multiply by 10,000. The result is 52,460; the nearest number in the column of squares is 52,441, which is opposite 229 in the column of numbers.

Move the decimal point two places to the left. The result is 2.29.

To find the cube root of a similar number, multiply by 1,000 or by 1,000,000, and find the nearest number in the column of cubes. The corresponding number in the column of numbers with a decimal point one or two places to the left is the required root. Perform similarly to preceding example.

To find the square root or cube root of a number greater than 1,000, find the nearest number in the column of squares or cubes and take the corresponding number in the first column. The number thus found is correct for the number of figures it contains.

To find various roots:

For the fourth root, take the square root of the square root.

For the sixth root, take the square root of the cube root or vice versa.

Higher roots, whose indices can be factored into 2's and 3's may be obtained in a similar manner.

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
1	1	1	1.	1.	21	441	9261	4. 5826	2. 7589
2	4	8	1. 4142	1. 2599	22	484	10648	4. 6904	2. 8020
3	9	27	1. 7321	1. 4422	23	529	12167	4. 7958	2. 8439
4	16	64	2. 0000	1. 5874	24	576	13824	4. 8990	2. 8845
5	25	125	2. 2361	1. 7100	25	625	15625	5.	2. 9240
6	36	216	2. 4495	1. 8171	26	676	17576	5. 0990	2. 9625
7	49	343	2. 6458	1. 9129	27	729	19683	5. 1962	3. 0000
8	64	512	2. 8284	2. 0000	28	784	21952	5. 2915	3. 0366
9	81	729	3. 0000	2. 0801	29	841	24389	5. 3852	3. 0723
10	100	1000	3. 1623	2. 1544	30	900	27000	5. 4772	3. 1072
11	121	1331	3. 3166	2. 2240	31	961	29791	5. 5678	3. 1414
12	144	1728	3. 4641	2. 2894	32	1024	32768	5. 6569	3. 1748
13	169	2197	3. 6056	2. 3513	33	1089	35937	5. 7446	3. 2075
14	196	2744	3. 7417	2. 4101	34	1156	39304	5. 8310	3. 2396
15	225	3375	3. 8730	2. 4662	35	1225	42875	5. 9161	3. 2711
16	256	4096	4.	2. 5198	36	1296	46656	6.	3. 3019
17	289	4913	4. 1231	2. 5713	37	1369	50653	6. 0828	3. 3322
18	324	5832	4. 2426	2. 6207	38	1444	54872	6. 1644	3. 3620
19	361	6859	4. 3589	2. 6684	39	1521	59319	6. 2450	3. 3912
20	400	8000	4. 4721	2. 7144	40	1600	64000	6. 3246	3. 4200

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
41	1681	68921	6.4031	3.4482	106	11236	1191016	10.2956	4.7326
42	1764	74088	6.4807	3.4760	107	11449	1225043	10.3441	4.7475
43	1849	79507	6.5574	3.5034	108	11664	1259712	10.3923	4.7622
44	1936	85184	6.6332	3.5303	109	11881	1295029	10.4403	4.7769
45	2025	91125	6.7082	3.5569	110	12100	1331000	10.4881	4.7914
46	2116	97336	6.7823	3.5830	111	12321	1367631	10.5357	4.8059
47	2209	103823	6.8557	3.6088	112	12544	1404928	10.5830	4.8203
48	2304	110592	6.9282	3.6342	113	12769	1442897	10.6301	4.8346
49	2401	117649	7.	3.6593	114	12996	1481544	10.6771	4.8488
50	2500	125000	7.0711	3.6840	115	13225	1520875	10.7238	4.8629
51	2601	132651	7.1414	3.7084	116	13456	1560896	10.7703	4.8770
52	2704	140608	7.2111	3.7325	117	13689	1601613	10.8167	4.8910
53	2809	148877	7.2801	3.7563	118	13924	1643032	10.8628	4.9049
54	2916	157464	7.3485	3.7798	119	14161	1685159	10.9087	4.9187
55	3025	166375	7.4162	3.8030	120	14400	1728000	10.9545	4.9324
56	3136	175616	7.4833	3.8259	121	14641	1771561	11.0000	4.9461
57	3249	185193	7.5498	3.8485	122	14884	1815848	11.0454	4.9597
58	3364	195112	7.6158	3.8709	123	15129	1860867	11.0905	4.9732
59	3481	205379	7.6811	3.8930	124	15376	1906624	11.1355	4.9866
60	3600	216000	7.7460	3.9149	125	15625	1953125	11.1803	5.
61	3721	226981	7.8102	3.9365	126	15876	2000376	11.2250	5.0133
62	3844	238328	7.8740	3.9579	127	16129	2048383	11.2694	5.0265
63	3969	250047	7.9373	3.9791	128	16384	2097152	11.3137	5.0397
64	4096	262144	8.	4.	129	16641	2146689	11.3578	5.0528
65	4225	274625	8.0623	4.0207	130	16900	2197000	11.4018	5.0658
66	4356	287496	8.1240	4.0412	131	17161	2248091	11.4455	5.0788
67	4489	300763	8.1854	4.0615	132	17424	2299968	11.4891	5.0916
68	4624	314432	8.2462	4.0817	133	17689	2352637	11.5326	5.1045
69	4761	328509	8.3066	4.1016	134	17956	2406104	11.5758	5.1172
70	4900	343000	8.3666	4.1213	135	18225	2460375	11.6190	5.1299
71	5041	357911	8.4261	4.1408	136	18496	2515456	11.6619	5.1426
72	5184	373248	8.4853	4.1602	137	18769	2571353	11.7047	5.1551
73	5329	389017	8.5440	4.1793	138	19044	2628072	11.7473	5.1676
74	5476	405224	8.6023	4.1983	139	19321	2685619	11.7898	5.1801
75	5625	421875	8.6603	4.2172	140	19600	2744000	11.8322	5.1925
76	5776	438976	8.7178	4.2358	141	19881	2803221	11.8743	5.2048
77	5929	456533	8.7750	4.2543	142	20164	2863288	11.9164	5.2171
78	6084	474552	8.8318	4.2727	143	20449	2924207	11.9583	5.2293
79	6241	493039	8.8882	4.2908	144	20736	2985984	12.	5.2415
80	6400	512000	8.9443	4.3089	145	21025	3048625	12.0416	5.2536
81	6561	531441	9.	4.3267	146	21316	3112136	12.0830	5.2656
82	6724	551368	9.0554	4.3445	147	21609	3176523	12.1244	5.2776
83	6889	571787	9.1104	4.3621	148	21904	3241792	12.1655	5.2896
84	7056	592704	9.1652	4.3795	149	22201	3307949	12.2066	5.3015
85	7225	614125	9.2195	4.3968	150	22500	3375000	12.2474	5.3133
86	7396	636056	9.2736	4.4140	151	22801	3442951	12.2882	5.3251
87	7569	658503	9.3274	4.4310	152	23104	3511808	12.3288	5.3368
88	7744	681472	9.3808	4.4480	153	23409	3581577	12.3693	5.3485
89	7921	704969	9.4340	4.4647	154	23716	3652264	12.4097	5.3601
90	8100	729000	9.4868	4.4814	155	24025	3723875	12.4499	5.3717
91	8281	753571	9.5394	4.4979	156	24336	3796416	12.4900	5.3832
92	8464	778688	9.5917	4.5144	157	24649	3869893	12.5300	5.3947
93	8649	804357	9.6437	4.5307	158	24964	3944312	12.5698	5.4061
94	8836	830584	9.6954	4.5468	159	25281	4019679	12.6095	5.4175
95	9025	857375	9.7468	4.5629	160	25600	4096000	12.6491	5.4288
96	9216	884736	9.7980	4.5789	161	25921	4173281	12.6886	5.4401
97	9409	912673	9.8489	4.5947	162	26244	4251528	12.7279	5.4514
98	9604	941192	9.8995	4.6104	163	26569	4330747	12.7671	5.4626
99	9801	970299	9.9499	4.6261	164	26896	4410944	12.8062	5.4737
100	10000	1000000	10.	4.6416	165	27225	4492125	12.8452	5.4848
101	10201	1030301	10.0499	4.6570	166	27556	4574296	12.8841	5.4959
102	10404	1061208	10.0995	4.6723	167	27889	4657463	12.9228	5.5069
103	10609	1092727	10.1489	4.6875	168	28224	4741632	12.9615	5.5178
104	10816	1124864	10.1980	4.7027	169	28561	4826809	13.	5.5288
105	11025	1157625	10.2470	4.7177	170	28900	4913000	13.0384	5.5397

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
171	29241	5000211	13. 0767	5. 5505	236	55696	13144256	15. 3623	6. 1797
172	29584	5088448	13. 1149	5. 5613	237	56169	13312053	15. 3948	6. 1885
173	29929	5177717	13. 1529	5. 5721	238	56644	13481272	15. 4272	6. 1972
174	30276	5268024	13. 1909	5. 5828	239	57121	13651919	15. 4596	6. 2058
175	30625	5359375	13. 2288	5. 5934	240	57600	13824000	15. 4919	6. 2145
176	30976	5451776	13. 2665	5. 6041	241	58081	13997521	15. 5242	6. 2231
177	31329	5545233	13. 3041	5. 6147	242	58564	14172488	15. 5563	6. 2317
178	31684	5639752	13. 3417	5. 6252	243	59049	14348907	15. 5885	6. 2403
179	32041	5735339	13. 3791	5. 6357	244	59536	14526784	15. 6205	6. 2488
180	32400	5832000	13. 4164	5. 6462	245	60025	14706125	15. 6525	6. 2573
181	32761	5929741	13. 4536	5. 6567	246	60516	14886936	15. 6844	6. 2658
182	33124	6028568	13. 4907	5. 6671	247	61009	15069223	15. 7162	6. 2743
183	33489	6128487	13. 5277	5. 6774	248	61504	15252992	15. 7480	6. 2828
184	33856	6229504	13. 5647	5. 6877	249	62001	15438249	15. 7797	6. 2912
185	34225	6331625	13. 6015	5. 6980	250	62500	15625000	15. 8114	6. 2996
186	34596	6434856	13. 6382	5. 7083	251	63001	15813251	15. 8430	6. 3080
187	34969	6539203	13. 6748	5. 7185	252	63504	16003008	15. 8745	6. 3164
188	35344	6644672	13. 7113	5. 7287	253	64009	16194277	15. 9060	6. 3247
189	35721	6751269	13. 7477	5. 7388	254	64516	16387064	15. 9374	6. 3330
190	36100	6859000	13. 7840	5. 7489	255	65025	16581375	15. 9687	6. 3413
191	36481	6967871	13. 8203	5. 7590	256	65536	16777216	16	6. 3496
192	36864	7077888	13. 8564	5. 7690	257	66049	16974593	16. 0312	6. 3579
193	37249	7189057	13. 8924	5. 7790	258	66564	17173512	16. 0624	6. 3661
194	37636	7301384	13. 9284	5. 7890	259	67081	17373979	16. 0935	6. 3743
195	38025	7414875	13. 9642	5. 7989	260	67600	17576000	16. 1245	6. 3825
196	38416	7529536	14.	5. 8088	261	68121	17779581	16. 1555	6. 3907
197	38809	7645373	14. 0357	5. 8186	262	68644	17984728	16. 1864	6. 3988
198	39204	7762392	14. 0712	5. 8285	263	69169	18191447	16. 2173	6. 4070
199	39601	7880599	14. 1067	5. 8383	264	69696	18399744	16. 2481	6. 4151
200	40000	8000000	14. 1421	5. 8480	265	70225	18609625	16. 2788	6. 4232
201	40401	8120601	14. 1774	5. 8578	266	70756	18821096	16. 3095	6. 4312
202	40804	8242408	14. 2127	5. 8675	267	71289	19034163	16. 3401	6. 4393
203	41209	8365427	14. 2478	5. 8771	268	71824	19248832	16. 3707	6. 4473
204	41616	8489664	14. 2829	5. 8868	269	72361	19465109	16. 4012	6. 4553
205	42025	8615125	14. 3178	5. 8964	270	72900	19683000	16. 4317	6. 4633
206	42436	8741816	14. 3527	5. 9059	271	73441	19902511	16. 4621	6. 4713
207	42849	8869743	14. 3875	5. 9155	272	73984	20123648	16. 4924	6. 4792
208	43264	8998912	14. 4222	5. 9250	273	74529	20346417	16. 5227	6. 4872
209	43681	9129329	14. 4568	5. 9345	274	75076	20570824	16. 5529	6. 4951
210	44100	9261000	14. 4914	5. 9439	275	75625	20796875	16. 5831	6. 5030
211	44521	9393931	14. 5258	5. 9533	276	76176	21024576	16. 6132	6. 5108
212	44944	9528128	14. 5602	5. 9627	277	76729	21253933	16. 6433	6. 5187
213	45369	9663597	14. 5945	5. 9721	278	77284	21484952	16. 6733	6. 5265
214	45796	9800344	14. 6287	5. 9814	279	77841	21717639	16. 7033	6. 5343
215	46225	9938375	14. 6629	5. 9907	280	78400	21952000	16. 7332	6. 5421
216	46656	10077696	14. 6969	6.	281	78961	22188041	16. 7631	6. 5499
217	47089	10218313	14. 7309	6. 0092	282	79524	22425768	16. 7929	6. 5577
218	47524	10360232	14. 7648	6. 0185	283	80089	22665187	16. 8226	6. 5654
219	47961	10503459	14. 7986	6. 0277	284	80656	22906304	16. 8523	6. 5731
220	48400	10648000	14. 8324	6. 0368	285	81225	23149125	16. 8819	6. 5808
221	48841	10793861	14. 8661	6. 0459	286	81796	23393656	16. 9115	6. 5885
222	49284	10941048	14. 8997	6. 0550	287	82369	23639903	16. 9411	6. 5962
223	49729	11089567	14. 9332	6. 0641	288	82944	23887872	16. 9706	6. 6039
224	50176	11239424	14. 9666	6. 0732	289	83521	24137569	17.	6. 6115
225	50625	11390625	15.	6. 0822	290	84100	24389000	17. 0294	6. 6191
226	51076	11543176	15. 0333	6. 0912	291	84681	24642171	17. 0587	6. 6267
227	51529	11697083	15. 0665	6. 1002	292	85264	24897088	17. 0880	6. 6343
228	51984	11852352	15. 0997	6. 1091	293	85849	25153757	17. 1172	6. 6419
229	52441	12008989	15. 1327	6. 1180	294	86436	25412184	17. 1464	6. 6494
230	52900	12167000	15. 1658	6. 1269	295	87025	25672375	17. 1756	6. 6569
231	53361	12326391	15. 1987	6. 1358	296	87616	25934336	17. 2047	6. 6644
232	53824	12487168	15. 2315	6. 1446	297	88209	26198073	17. 2337	6. 6719
233	54289	12649337	15. 2643	6. 1534	298	88804	26463592	17. 2627	6. 6794
234	54756	12812904	15. 2971	6. 1622	299	89401	26730899	17. 2916	6. 6869
235	55225	12977875	15. 3297	6. 1710	300	90000	27000000	17. 3205	6. 6943

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
301	90601	27270901	17.3494	6.7018	366	133956	49027896	19.1311	7.1531
302	91204	27543608	17.3781	6.7092	367	134689	49430863	19.1572	7.1596
303	91809	27818127	17.4069	6.7166	368	135424	49836032	19.1833	7.1661
304	92416	28094464	17.4356	6.7240	369	136161	50243409	19.2094	7.1726
305	93025	28372625	17.4642	6.7313	370	136900	50653000	19.2354	7.1791
306	93636	28652616	17.4929	6.7387	371	137641	51064811	19.2614	7.1855
307	94249	28934443	17.5214	6.7460	372	138384	51478848	19.2873	7.1920
308	94864	29218112	17.5499	6.7533	373	139129	51895117	19.3132	7.1984
309	95481	29503629	17.5784	6.7606	374	139876	52313624	19.3391	7.2048
310	96100	29791000	17.6068	6.7679	375	140625	52734375	19.3649	7.2112
311	96721	30080231	17.6352	6.7752	376	141376	53157376	19.3907	7.2177
312	97344	30371328	17.6635	6.7824	377	142129	53582633	19.4165	7.2240
313	97969	30664297	17.6918	6.7897	378	142884	54010152	19.4422	7.2304
314	98596	30959144	17.7200	6.7969	379	143641	54439939	19.4679	7.2368
315	99225	31255875	17.7482	6.8041	380	144400	54872000	19.4936	7.2432
316	99856	31554496	17.7764	6.8113	381	145161	55306341	19.5192	7.2495
317	100489	31855013	17.8045	6.8185	382	145924	55742968	19.5448	7.2558
318	101124	32157432	17.8326	6.8256	383	146689	56181887	19.5704	7.2622
319	101761	32461759	17.8606	6.8328	384	147456	56623104	19.5959	7.2685
320	102400	32768000	17.8885	6.8399	385	148225	57066625	19.6214	7.2748
321	103041	33076161	17.9165	6.8470	386	148996	57512456	19.6469	7.2811
322	103684	33386248	17.9444	6.8541	387	149769	57960603	19.6723	7.2874
323	104329	33698267	17.9722	6.8612	388	150544	58411072	19.6977	7.2936
324	104976	34012224	18.	6.8683	389	151321	58863869	19.7231	7.2999
325	105625	34328125	18.0278	6.8753	390	152100	59319000	19.7484	7.3061
326	106276	34645976	18.0555	6.8824	391	152881	59776471	19.7737	7.3124
327	106929	34965783	18.0831	6.8894	392	153664	60236288	19.7990	7.3186
328	107584	35287552	18.1108	6.8964	393	154449	60698457	19.8242	7.3248
329	108241	35611289	18.1384	6.9034	394	155236	61162984	19.8494	7.3310
330	108900	35937000	18.1659	6.9104	395	156025	61629875	19.8746	7.3372
331	109561	36264691	18.1934	6.9174	396	156816	62099136	19.8997	7.3434
332	110224	36594368	18.2209	6.9244	397	157609	62570773	19.9249	7.3496
333	110889	36926037	18.2483	6.9313	398	158404	63044792	19.9499	7.3558
334	111556	37259704	18.2757	6.9382	399	159201	63521199	19.9750	7.3619
335	112225	37595375	18.3030	6.9451	400	160000	64000000	20.	7.3681
336	112896	37933056	18.3303	6.9521	401	160801	64481201	20.0250	7.3742
337	113569	38272753	18.3576	6.9589	402	161604	64964808	20.0499	7.3803
338	114244	38614472	18.3848	6.9658	403	162409	65450827	20.0749	7.3864
339	114921	38958219	18.4120	6.9727	404	163216	65939264	20.0998	7.3925
340	115600	39304000	18.4391	6.9795	405	164025	66430125	20.1246	7.3986
341	116281	39651821	18.4662	6.9864	406	164836	66923416	20.1494	7.4047
342	116964	40001688	18.4932	6.9932	407	165649	67419143	20.1742	7.4108
343	117649	40353607	18.5203	7.	408	166464	67917312	20.1990	7.4169
344	118336	40707584	18.5472	7.0068	409	167281	68417929	20.2237	7.4229
345	119025	41063625	18.5742	7.0136	410	168100	68921000	20.2485	7.4290
346	119716	41421736	18.6011	7.0203	411	168921	69426531	20.2731	7.4350
347	120409	41781923	18.6279	7.0271	412	169744	69934528	20.2978	7.4410
348	121104	42144192	18.6548	7.0338	413	170569	70444997	20.3224	7.4470
349	121801	42508549	18.6815	7.0406	414	171396	70957944	20.3470	7.4530
350	122500	42875000	18.7083	7.0473	415	172225	71473375	20.3715	7.4590
351	123201	43243551	18.7350	7.0540	416	173056	71991296	20.3961	7.4650
352	123904	43614208	18.7617	7.0607	417	173889	72511713	20.4206	7.4710
353	124609	43986977	18.7883	7.0674	418	174724	73034632	20.4450	7.4770
354	125316	44361864	18.8149	7.0740	419	175561	73560059	20.4695	7.4829
355	126025	44738875	18.8414	7.0807	420	176400	74088000	20.4939	7.4889
356	126736	45118016	18.8680	7.0873	421	177241	74618461	20.5183	7.4948
357	127449	45499293	18.8944	7.0940	422	178084	75151448	20.5426	7.5007
358	128164	45882712	18.9209	7.1006	423	178929	75686967	20.5670	7.5067
359	128881	46268279	18.9473	7.1072	424	179776	76225024	20.5913	7.5126
360	129600	46656000	18.9737	7.1138	425	180625	76765625	20.6155	7.5185
361	130321	47045881	19.	7.1204	426	181476	77308776	20.6398	7.5244
362	131044	47437928	19.0263	7.1269	427	182329	77854483	20.6640	7.5302
363	131769	47832147	19.0526	7.1335	428	183184	78402752	20.6882	7.5361
364	132496	48228544	19.0788	7.1400	429	184041	78953589	20.7123	7.5420
365	133225	48627125	19.1050	7.1466	430	184900	79507000	20.7364	7.5478

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
431	185761	80062991	20.7605	7.5537	496	246016	122023936	22.2711	7.9158
432	186624	80621568	20.7846	7.5595	497	247009	122763473	22.2935	7.9211
433	187489	81182737	20.8087	7.5654	498	248004	123505992	22.3159	7.9264
434	188356	81746504	20.8327	7.5712	499	249001	124251499	22.3383	7.9317
435	189225	82312875	20.8567	7.5770	500	250000	125000000	22.3607	7.9370
436	190096	82881856	20.8806	7.5828	501	251001	125751501	22.3830	7.9423
437	190969	83453453	20.9045	7.5886	502	252004	126506008	22.4054	7.9476
438	191844	84027672	20.9284	7.5944	503	253009	127263527	22.4277	7.9528
439	192721	84604519	20.9523	7.6001	504	254016	128024064	22.4499	7.9581
440	193600	85184000	20.9762	7.6059	505	255025	128787625	22.4722	7.9634
441	194481	85766121	21.	7.6117	506	256036	129554216	22.4944	7.9686
442	195364	86350888	21.0238	7.6174	507	257049	130323843	22.5167	7.9739
443	196249	86938307	21.0476	7.6232	508	258064	131096512	22.5389	7.9791
444	197136	87528384	21.0713	7.6289	509	259081	131872229	22.5610	7.9843
445	198025	88121125	21.0950	7.6346	510	260100	132651000	22.5832	7.9896
446	198916	88716536	21.1187	7.6403	511	261121	133432831	22.6053	7.9948
447	198809	89314623	21.1424	7.6460	512	262144	134217728	22.6274	8.
448	200704	89915392	21.1660	7.6517	513	263169	135005697	22.6495	8.0052
449	201601	90518849	21.1896	7.6574	514	264196	135796744	22.6716	8.0104
450	202500	91125000	21.2132	7.6631	515	265225	136590875	22.6936	8.0156
451	203401	91733851	21.2368	7.6688	516	266256	137388096	22.7156	8.0208
452	204304	92345408	21.2603	7.6744	517	267289	138188413	22.7376	8.0260
453	205209	92959677	21.2838	7.6801	518	268324	138991832	22.7596	8.0311
454	206116	93576664	21.3073	7.6857	519	269361	139798359	22.7816	8.0363
455	207025	94196375	21.3307	7.6914	520	270400	140608000	22.8035	8.0415
456	207936	94818816	21.3542	7.6970	521	271441	141420761	22.8254	8.0466
457	208849	95443993	21.3776	7.7026	522	272484	142236648	22.8473	8.0517
458	209764	96071912	21.4009	7.7082	523	273529	143055667	22.8692	8.0569
459	210681	96702579	21.4243	7.7138	524	274576	143877824	22.8910	8.0620
460	211600	97336000	21.4476	7.7194	525	275625	144703125	22.9129	8.0671
461	212521	97972181	21.4709	7.7250	526	276676	145531576	22.9347	8.0723
462	213444	98611128	21.4942	7.7306	527	277729	146363183	22.9565	8.0774
463	214369	99252847	21.5174	7.7362	528	278784	147197952	22.9783	8.0825
464	215296	99897344	21.5407	7.7418	529	279841	148035889	23.	8.0876
465	216225	100544625	21.5639	7.7473	530	280900	148877000	23.0217	8.0927
466	217156	101194696	21.5870	7.7529	531	281961	149721291	23.0434	8.0978
467	218089	101847563	21.6102	7.7584	532	283024	150568768	23.0651	8.1028
468	219024	102503232	21.6333	7.7639	533	284089	151419437	23.0868	8.1079
469	219961	103161709	21.6564	7.7695	534	285156	152273304	23.1084	8.1130
470	220900	103823000	21.6795	7.7750	535	286225	153130375	23.1301	8.1180
471	221841	104487111	21.7025	7.7805	536	287296	153990656	23.1517	8.1231
472	222784	105154048	21.7256	7.7860	537	288369	154854153	23.1733	8.1281
473	223729	105823817	21.7486	7.7915	538	289444	155720872	23.1948	8.1332
474	224676	106496424	21.7715	7.7970	539	290521	156590819	23.2164	8.1382
475	225625	107171875	21.7945	7.8025	540	291600	157464000	23.2379	8.1433
476	226576	107850176	21.8174	7.8079	541	292681	158340421	23.2594	8.1483
477	227529	108531333	21.8403	7.8134	542	293764	159220088	23.2809	8.1533
478	228484	109215352	21.8632	7.8188	543	294849	160103007	23.3024	8.1583
479	229441	109902239	21.8861	7.8243	544	295936	160989184	23.3238	8.1633
480	230400	110592000	21.9089	7.8297	545	297025	161878625	23.3452	8.1683
481	231361	111284641	21.9317	7.8352	546	298116	162771336	23.3666	8.1733
482	232324	111980168	21.9545	7.8406	547	299209	163667323	23.3880	8.1783
483	233289	112678587	21.9773	7.8460	548	300304	164566592	23.4094	8.1833
484	234256	113379904	22.	7.8514	549	301401	165469149	23.4307	8.1882
485	235225	114084125	22.0227	7.8568	550	302500	166375000	23.4521	8.1932
486	236196	114791256	22.0454	7.8622	551	303601	167284151	23.4734	8.1982
487	237169	115501303	22.0681	7.8676	552	304704	168196608	23.4947	8.2031
488	238144	116214272	22.0907	7.8730	553	305809	169112377	23.5160	8.2081
489	239121	116930169	22.1133	7.8784	554	306916	170031464	23.5372	8.2130
490	240100	117649000	22.1359	7.8837	555	308025	170953875	23.5584	8.2180
491	241081	118370771	22.1585	7.8891	556	309136	171879616	23.5797	8.2229
492	242064	119095488	22.1811	7.8944	557	310249	172808693	23.6008	8.2278
493	243049	119823157	22.2036	7.8998	558	311364	173741112	23.6220	8.2327
494	244036	120553784	22.2261	7.9051	559	312481	174676879	23.6432	8.2377
495	245025	121287375	22.2486	7.9105	560	313600	175616000	23.6643	8.2426

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
561	314721	176558481	23. 6854	8. 2475	626	391876	245314376	25. 0200	8. 5544
562	315844	177504328	23. 7065	8. 2524	627	393129	246491883	25. 0400	8. 5590
563	316969	178453547	23. 7276	8. 2573	628	394384	247673152	25. 0599	8. 5635
564	318096	179406144	23. 7487	8. 2621	629	395641	248858189	25. 0799	8. 5681
565	319225	180362125	23. 7697	8. 2670	630	396900	250047000	25. 0998	8. 5726
566	320356	181321496	23. 7908	8. 2719	631	398161	251239591	25. 1197	8. 5772
567	321489	182284263	23. 8118	8. 2768	632	399424	252435968	25. 1396	8. 5817
568	322624	183250432	23. 8328	8. 2816	633	400689	253636137	25. 1595	8. 5862
569	323761	184220009	23. 8537	8. 2865	634	401956	254840104	25. 1794	8. 5907
570	324900	185193000	23. 8747	8. 2913	635	403225	256047875	25. 1992	8. 5952
571	326041	186169411	23. 8956	8. 2962	636	404496	257259456	25. 2190	8. 5997
572	327184	187149248	23. 9165	8. 3010	637	405769	258474853	25. 2389	8. 6043
573	328329	188132517	23. 9374	8. 3059	638	407044	259694072	25. 2587	8. 6088
574	329476	189119224	23. 9583	8. 3107	639	408321	260917119	25. 2784	8. 6132
575	330625	190109375	23. 9792	8. 3155	640	409600	262144000	25. 2982	8. 6177
576	331776	191102976	24.	8. 3203	641	410881	263374721	25. 3180	8. 6222
577	332929	192100033	24. 0208	8. 3251	642	412164	264609288	25. 3377	8. 6267
578	334084	193100552	24. 0416	8. 3300	643	413449	265847707	25. 3574	8. 6312
579	335241	194104539	24. 0624	8. 3348	644	414736	267089984	25. 3772	8. 6357
580	336400	195112000	24. 0832	8. 3396	645	416025	268336125	25. 3969	8. 6401
581	337561	196122941	24. 1039	8. 3443	646	417316	269586136	25. 4165	8. 6446
582	338724	197137368	24. 1247	8. 3491	647	418609	270840023	25. 4362	8. 6490
583	339889	198155287	24. 1454	8. 3539	648	419904	272097792	25. 4558	8. 6535
584	341056	199176704	24. 1661	8. 3587	649	421201	273359449	25. 4755	8. 6579
585	342225	200201625	24. 1868	8. 3634	650	422500	274625000	25. 4951	8. 6624
586	343396	201230056	24. 2074	8. 3682	651	423801	275894451	25. 5147	8. 6668
587	344569	202262003	24. 2281	8. 3730	652	425104	277167808	25. 5343	8. 6713
588	345744	203297472	24. 2487	8. 3777	653	426409	278445077	25. 5539	8. 6757
589	346921	204336469	24. 2693	8. 3825	654	427716	279726264	25. 5734	8. 6801
590	348100	205379000	24. 2899	8. 3872	655	429025	281011375	25. 5930	8. 6845
591	349281	206425071	24. 3105	8. 3919	656	430336	282300416	25. 6125	8. 6890
592	350464	207474688	24. 3311	8. 3967	657	431649	283593393	25. 6320	8. 6934
593	351649	208527857	24. 3516	8. 4014	658	432964	284890312	25. 6515	8. 6978
594	352836	209584584	24. 3721	8. 4061	659	434281	286191179	25. 6710	8. 7022
595	354025	210644875	24. 3926	8. 4108	660	435600	287496000	25. 6905	8. 7066
596	355216	211708736	24. 4131	8. 4155	661	436921	288804781	25. 7099	8. 7110
597	356409	212776173	24. 4336	8. 4202	662	438244	290117528	25. 7294	8. 7154
598	357604	213847192	24. 4540	8. 4249	663	439569	291434247	25. 7488	8. 7198
599	358801	214921799	24. 4745	8. 4296	664	440896	292754944	25. 7682	8. 7241
600	360000	216000000	24. 4949	8. 4343	665	442225	294079625	25. 7876	8. 7285
601	361201	217081801	24. 5153	8. 4390	666	443556	295408296	25. 8070	8. 7329
602	362404	218167208	24. 5357	8. 4437	667	444889	296740963	25. 8263	8. 7373
603	363609	219256227	24. 5561	8. 4484	668	446224	298077632	25. 8457	8. 7416
604	364816	220348864	24. 5764	8. 4530	669	447561	299418309	25. 8650	8. 7460
605	366025	221445125	24. 5967	8. 4577	670	448900	300763000	25. 8844	8. 7503
606	367236	222545016	24. 6171	8. 4623	671	450241	302111711	25. 9037	8. 7547
607	368449	223648543	24. 6374	8. 4670	672	451584	303464448	25. 9230	8. 7590
608	369664	224755712	24. 6577	8. 4716	673	452929	304821217	25. 9422	8. 7634
609	370881	225866529	24. 6779	8. 4763	674	454276	306182024	25. 9615	8. 7677
610	372100	226981000	24. 6982	8. 4809	675	455625	307546875	25. 9808	8. 7721
611	373321	228099131	24. 7184	8. 4856	676	456976	308915776	26.	8. 7764
612	374544	229220928	24. 7386	8. 4902	677	458329	310288733	26. 0192	8. 7807
613	375769	230346397	24. 7588	8. 4948	678	459684	311665752	26. 0384	8. 7850
614	376996	231475544	24. 7790	8. 4994	679	461041	313046839	26. 0576	8. 7893
615	378225	232608375	24. 7992	8. 5040	680	462400	314432000	26. 0768	8. 7937
616	379456	233744896	24. 8193	8. 5086	681	463761	315821241	26. 0960	8. 7980
617	380689	234885113	24. 8395	8. 5132	682	465124	317214568	26. 1151	8. 8023
618	381924	236029032	24. 8596	8. 5178	683	466489	318611987	26. 1343	8. 8066
619	383161	237176659	24. 8797	8. 5224	684	467856	320013504	26. 1534	8. 8109
620	384400	238328000	24. 8998	8. 5270	685	469225	321419125	26. 1725	8. 8152
621	385641	239483061	24. 9199	8. 5316	686	470596	322828856	26. 1916	8. 8194
622	386884	240641848	24. 9399	8. 5362	687	471969	324242703	26. 2107	8. 8237
623	388129	241804367	24. 9600	8. 5408	688	473344	325660672	26. 2298	8. 8280
624	389376	242970624	24. 9800	8. 5453	689	474721	327082769	26. 2488	8. 8323
625	390625	244140625	25.	8. 5499	690	476100	328509000	26. 2679	8. 8366

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
691	477481	329939371	26. 2869	8. 8408	756	571536	432081216	27. 4955	9. 1098
692	478864	331373888	26. 3059	8. 8451	757	573049	433798093	27. 5136	9. 1138
693	480249	332812557	26. 3249	8. 8493	758	574564	435519512	27. 5318	9. 1178
694	481636	334255384	26. 3439	8. 8536	759	576081	437245479	27. 5500	9. 1218
695	483025	335702375	26. 3629	8. 8578	760	577600	438976000	27. 5681	9. 1258
696	484416	337153536	26. 3818	8. 8621	761	579121	440711081	27. 5862	9. 1298
697	485809	338608873	26. 4008	8. 8663	762	580644	442450728	27. 6043	9. 1338
698	487204	340068392	26. 4197	8. 8706	763	582169	444194947	27. 6225	9. 1378
699	488601	341532099	26. 4386	8. 8748	764	583696	445943744	27. 6405	9. 1418
700	490000	343000000	26. 4575	8. 8790	765	585225	447697125	27. 6586	9. 1458
701	491401	344472101	26. 4764	8. 8833	766	586756	449455096	27. 6767	9. 1498
702	492804	345948408	26. 4953	8. 8875	767	588289	451217663	27. 6948	9. 1537
703	494209	347428927	26. 5141	8. 8917	768	589824	452984832	27. 7128	9. 1577
704	495616	348913664	26. 5330	8. 8959	769	591361	454756609	27. 7308	9. 1617
705	497025	350402625	26. 5518	8. 9001	770	592900	456533000	27. 7489	9. 1657
706	498436	351895816	26. 5707	8 9043	771	594441	458314011	27. 7669	9. 1696
707	499849	353393243	26. 5895	8. 9085	772	595984	460099648	27. 7849	9. 1736
708	501264	354894912	26. 6083	8. 9127	773	597529	461889917	27. 8029	9. 1775
709	502681	356400829	26. 6271	8. 9169	774	599076	463684824	27. 8209	9. 1815
710	504100	357911000	26. 6458	8. 9211	775	600625	465484375	27. 8388	9. 1855
711	505521	359425431	26. 6646	8. 9253	776	602176	467288576	27. 8568	9. 1894
712	506944	360944128	26. 6833	8. 9295	777	603729	469097433	27. 8747	9. 1933
713	508369	362467097	26. 7021	8. 9337	778	605284	470910952	27. 8927	9. 1973
714	509796	363994344	26. 7208	8. 9378	779	606841	472729139	27. 9106	9. 2012
715	511225	365525875	26. 7395	8. 9420	780	608400	474552000	27. 9285	9. 2052
716	512656	367061696	26. 7582	8. 9462	781	609961	476379541	27. 9464	9. 2091
717	514089	368601813	26. 7769	8. 9503	782	611524	478211768	27. 9643	9. 2130
718	515524	370146232	26. 7955	8. 9545	783	613089	480048687	27. 9821	9. 2170
719	516961	371694959	26. 8142	8. 9587	784	614656	481890304	28.	9. 2209
720	518400	373248000	26. 8328	8. 9628	785	616225	483736625	28. 0179	9. 2248
721	519841	374805361	26. 8514	8. 9670	786	617796	485587656	28. 0357	9. 2287
722	521284	376367048	26. 8701	8. 9711	787	619369	487443403	28. 0535	9. 2326
723	522729	377933067	26. 8887	8. 9752	788	620944	489303872	28. 0713	9. 2365
724	524176	379503424	26. 9072	8. 9794	789	622521	491169069	28. 0891	9. 2404
725	525625	381078125	26. 9258	8. 9835	790	624100	493039000	28. 1069	9. 2443
726	527076	382657176	26. 9444	8. 9876	791	625681	494913671	28. 1247	9. 2482
727	528529	384240583	26. 9629	8. 9918	792	627264	496793088	28. 1425	9. 2521
728	529984	385828352	26. 9815	8. 9959	793	628849	498677257	28. 1603	9. 2560
729	531441	387420489	27.	9.	794	630436	500566184	28. 1780	9. 2599
730	532900	389017000	27. 0185	9. 0041	795	632025	502459875	28. 1957	9. 2638
731	534361	390617891	27. 0370	9. 0082	796	633616	504358336	28. 2135	9. 2677
732	535824	392223168	27. 0555	9. 0123	797	635209	506261573	28. 2312	9. 2716
733	537289	393832837	27. 0740	9. 0164	798	636804	508169592	28. 2489	9. 2754
734	538756	395446904	27. 0924	9. 0205	799	638401	510082399	28. 2666	9. 2793
735	540225	397065375	27. 1109	9. 0246	800	640000	512000000	28. 2843	9. 2832
736	541696	398688256	27. 1293	9. 0287	801	641601	513922401	28. 3019	9. 2870
737	543169	400315553	27. 1477	9. 0328	802	643204	515849608	28. 3196	9. 2909
738	544644	401947272	27. 1662	9. 0369	803	644809	517781627	28. 3373	9 2948
739	546121	403583419	27. 1846	9. 0410	804	646416	519718464	28. 3549	9. 2986
740	547600	405224000	27. 2029	9. 0450	805	648025	521660125	28. 3725	9. 3025
741	549081	406869021	27. 2213	9. 0491	806	649636	523606616	28. 3901	9. 3063
742	550564	408518488	27. 2397	9. 0532	807	651249	525557943	28. 4077	9. 3102
743	552049	410172407	27. 2580	9. 0572	808	652864	527514112	28. 4253	9. 3140
744	553536	411830784	27. 2764	9. 0613	809	654481	529475129	28. 4429	9. 3179
745	555025	413493625	27. 2947	9. 0654	810	656100	531441000	28. 4605	9. 3217
746	556516	415160936	27. 3130	9. 0694	811	657721	533411731	28. 4781	9. 3255
747	558009	416832723	27. 3313	9. 0735	812	659344	535387328	28. 4956	9. 3294
748	559504	418508992	27. 3496	9. 0775	813	660969	537367797	28. 5132	9. 3332
749	561001	420189749	27. 3679	9. 0816	814	662596	539353144	28. 5307	9. 3370
750	562500	421875000	27. 3861	9. 0856	815	664225	541343375	28. 5482	9. 3408
751	564001	423564751	27. 4044	9. 0896	816	665856	543338496	28. 5657	9. 3447
752	565504	425259008	27. 4226	9. 0937	817	667489	545338513	28. 5832	9. 3485
753	567009	426957777	27. 4408	9. 0977	818	669124	547343432	28. 6007	9. 3523
754	568516	428661064	27. 4591	9. 1017	819	670761	549353259	28. 6182	9. 3561
755	570025	430368875	27. 4773	9. 1057	820	672400	551368000	28. 6653	9. 3599

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
821	674041	553387661	28. 6531	9. 3637	886	784996	695506456	29. 7658	9. 6046
822	675684	555412248	28. 6705	9. 3675	887	786769	697864103	29. 7825	9. 6082
823	677329	557441767	28. 6880	9. 3713	888	788544	700227072	29. 7993	9. 6118
824	678976	559476224	28. 7054	9. 3751	889	790321	702595369	29. 8161	9. 6154
825	680625	561515625	28. 7228	9. 3789	890	792100	704969000	29. 8329	9. 6190
826	682276	563559976	28. 7402	9. 3827	891	793881	707347971	29. 8496	9. 6226
827	683929	565609283	28. 7576	9. 3865	892	795664	709732288	29. 8664	9. 6262
828	685584	567663552	28. 7750	9. 3902	893	797449	712121957	29. 8831	9. 6298
829	687241	569722789	28. 7924	9. 3940	894	799236	714516984	29. 8998	9. 6334
830	688900	571787000	28. 8097	9. 3978	895	801025	716917375	29. 9166	9. 6370
831	690561	573856191	28. 8271	9. 4016	896	802816	719323136	29. 9333	9. 6406
832	692224	575930368	28. 8444	9. 4053	897	804609	721734273	29. 9500	9. 6442
833	693889	578009537	28. 8617	9. 4091	898	806404	724150792	29. 9666	9. 6477
834	695556	580093704	28. 8791	9. 4129	899	808201	726572699	29. 9833	9. 6513
835	697225	582182875	28. 8964	9. 4166	900	810000	729000000	30.	9. 6549
836	698896	584277056	28. 9137	9. 4204	901	811801	731432701	30. 0167	9. 6585
837	700569	586376253	28. 9310	9. 4241	902	813604	733870808	30. 0333	9. 6620
838	702244	588480472	28. 9482	9. 4279	903	815409	736314327	30. 0500	9. 6656
839	703921	590589719	28. 9655	9. 4316	904	817216	738763264	30. 0666	9. 6692
840	705600	592704000	28. 9828	9. 4354	905	819025	741217625	30. 0832	9. 6727
841	707281	594823321	29.	9. 4391	906	820836	743677416	30. 0998	9. 6763
842	708964	596947688	29. 0172	9. 4429	907	822649	746142643	30. 1164	9. 6799
843	710649	599077107	29. 0345	9. 4466	908	824464	748613312	30. 1330	9. 6834
844	712336	601211584	29. 0517	9. 4503	909	826281	751089429	30. 1496	9. 6870
845	714025	603351125	29. 0689	9. 4541	910	828100	753571000	30. 1662	9. 6905
846	715716	605495736	29. 0861	9. 4578	911	829921	756058031	30. 1828	9. 6941
847	717409	607645423	29. 1033	9. 4615	912	831744	758550528	30. 1993	9. 6976
848	719104	609800192	29. 1204	9. 4652	913	833569	761048497	30. 2159	9. 7012
849	720801	611960049	29. 1376	9. 4690	914	835396	763551944	30. 2324	9. 7047
850	722500	614125000	29. 1548	9. 4727	915	837225	766060875	30. 2490	9. 7082
851	724201	616295051	29. 1719	9. 4764	916	839056	768575296	30. 2655	9. 7118
852	725904	618470208	29. 1890	9. 4801	917	840889	771095213	30. 2820	9. 7153
853	727609	620650477	29. 2062	9. 4838	918	842724	773620632	30. 2985	9. 7188
854	729316	622835864	29. 2233	9. 4875	919	844561	776151559	30. 3150	9. 7224
855	731025	625026375	29. 2204	9. 4912	920	846400	778688000	30. 3315	9. 7259
856	732736	627222016	29. 2575	9. 4949	921	848241	781229961	30. 3480	9. 7294
857	734449	629422793	29. 2746	9. 4986	922	850084	783777448	30. 3645	9. 7329
858	736164	631628712	29. 2916	9. 5023	923	851929	786330467	30. 3809	9. 7364
859	737881	633839779	29. 3087	9. 5060	924	853776	788889024	30. 3974	9. 7400
860	739600	636056000	29. 3258	9. 5097	925	855625	791453125	30. 4138	9. 7435
861	741321	638277381	29. 3428	9. 5134	926	857476	794022776	30. 4302	9. 7470
862	743044	640503928	29. 3598	9. 5171	927	859329	796597983	30. 4467	9. 7505
863	744769	642735647	29. 3769	9. 5207	928	861184	799178752	30. 4631	9. 7540
864	746496	644972544	29. 3939	9. 5244	929	863041	801765089	30. 4795	9. 7575
865	748225	647214625	29. 4109	9. 5281	930	864900	804357000	30. 4959	9. 7610
866	749956	649461896	29. 4279	9. 5317	931	866761	806954491	30. 5123	9. 7645
867	751689	651714363	29. 4449	9. 5354	932	868624	809557568	30. 5287	9. 7680
868	753424	653972032	29. 4618	9. 5391	933	870489	812166237	30. 5450	9. 7715
869	755161	656234909	29. 4788	9. 5427	934	872356	814780504	30. 5614	9. 7750
870	756900	658503000	29. 4958	9. 5464	935	874225	817400375	30. 5778	9. 7785
871	758641	660776311	29. 5127	9. 5501	936	876096	820025856	30. 5941	9. 7819
872	760384	663054848	29. 5296	9. 5537	937	877969	822656953	30. 6105	9. 7854
873	762129	665338617	29. 5466	9. 5574	938	879844	825293672	30. 6268	9. 7889
874	763876	667627624	29. 5635	9. 5610	939	881721	827936019	30. 6431	9. 7924
875	765625	669921875	29. 5804	9. 5647	940	883600	830584000	30. 6594	9. 7959
876	767376	672221376	29. 5973	9. 5683	941	885481	833237621	30. 6757	9. 7993
877	769129	674526133	29. 6142	9. 5719	942	887364	835896888	30. 6920	9. 8028
878	770884	676836152	29. 6311	9. 5756	943	889249	838561807	30. 7083	9. 8063
879	772641	679151439	29. 6479	9. 5792	944	891136	841232384	30. 7246	9. 8097
880	774400	681472000	29. 6648	9. 5828	945	893025	843908625	30. 7409	9. 8132
881	776161	683797841	29. 6816	9. 5865	946	894916	846590536	30. 7571	9. 8167
882	777924	686128968	29. 6985	9. 5901	947	896809	849278123	30. 7734	9. 8201
883	779689	688465387	29. 7153	9. 5937	948	898704	851971392	30. 7896	9. 8236
884	781456	690807104	29. 7321	9. 5973	949	900601	854670349	30. 8058	9. 8270
885	783225	693154125	29. 7489	9. 6010	950	902500	857375000	30. 8221	9. 8305

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TABLE XLI.—*Squares, cubes, square roots, and cube roots*—Continued

No.	Square	Cube	Sq. rt.	Cu. rt.	No.	Square	Cube	Sq. rt.	Cu. rt.
951	904401	860085351	30.8383	9.8339	976	952576	929714176	31.2410	9.9194
952	906304	862801408	30.8545	9.8374	977	954529	932574833	31.2570	9.9227
953	908209	865523177	30.8707	9.8408	978	956484	935441352	31.2730	9.9261
954	910116	868250664	30.8869	9.8443	979	958441	938313739	31.2890	9.9295
955	912025	870983875	30.9031	9.8477	980	960400	941192000	31.3050	9.9329
956	913936	873722816	30.9192	9.8511	981	962361	944076141	31.3209	9.9363
957	915849	876467493	30.9354	9.8546	982	964324	946966168	31.3369	9.9396
958	917764	879217912	30.9516	9.8580	983	966289	949862087	31.3528	9.9430
959	919681	881974079	30.9677	9.8614	984	968256	952763904	31.3688	9.9464
960	921600	884736000	30.9839	9.8648	985	970225	955671625	31.3847	9.9497
961	923521	887503681	31.	9.8683	986	972196	958585256	31.4006	9.9531
962	925444	890277128	31.0161	9.8717	977	974169	961504803	31.4166	9.9565
963	927369	893056347	31.0322	9.8751	988	976144	964430272	31.4325	9.9598
964	929296	895841344	31.0483	9.8785	989	978121	967361669	31.4484	9.9632
965	931225	898632125	31.0644	9.8819	990	980100	970299000	31.4643	9.9666
966	933156	901428696	31.0805	9.8854	991	982081	973242271	31.4802	9.9699
967	935089	904231063	31.0966	9.8888	992	984064	976191488	31.4960	9.9733
968	937024	907039232	31.1127	9.8922	993	986049	979146657	31.5119	9.9766
969	938961	909853209	31.1288	9.8956	994	988036	982107784	31.5278	9.9800
970	940900	912673000	31.1448	9.8990	995	990025	985074875	31.5436	9.9833
971	942841	915498611	31.1609	9.9024	996	992016	988047936	31.5595	9.9866
972	944784	918330048	31.1769	9.9058	997	994009	991026973	31.5753	9.9900
973	946729	921167317	31.1929	9.9092	998	996004	994011992	31.5911	9.9933
974	948676	924010424	31.2090	9.9126	999	998001	997002999	31.6070	9.9967
975	950625	926859375	31.2250	9.9160	1000	1000000	1000000000	31.6228	10.

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TABLE XLII

CONVERSION OF INCHES AND SIXTEENTHS TO DECIMALS OF A FOOT

In.	0	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16
0	000	005	010	016	021	026	031	036	042	047	052	057	062	068	073	078
1	083	089	094	099	104	109	115	120	125	130	135	141	146	151	156	161
2	167	172	177	182	188	193	198	203	208	214	219	224	229	234	240	245
3	250	255	260	266	271	276	281	286	292	297	302	307	313	318	323	328
4	333	339	344	349	354	359	365	370	375	380	385	391	396	401	406	411
5	417	422	427	432	438	443	448	453	458	464	469	474	479	484	490	495
6	500	505	510	516	521	526	531	536	542	547	552	557	562	568	573	578
7	583	589	594	599	604	609	615	620	625	630	635	641	646	651	656	661
8	667	672	677	682	688	693	698	703	708	714	719	724	729	734	740	745
9	750	755	760	766	771	776	781	786	792	797	802	807	813	818	823	828
10	833	839	844	849	854	859	865	870	875	880	885	891	896	901	906	911
11	917	922	927	932	938	943	948	953	958	964	969	974	979	984	990	995

TABLE XLIII

CONVERSION OF SIXTEENTHS OF AN INCH TO DECIMALS OF AN INCH

1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16	10/16	11/16	12/16	13/16	14/16	15/16
063	125	188	250	313	375	438	500	563	625	688	750	813	875	938

TABLE XLIV

MAP SCALES IN ENGLISH MEASURE AND METRIC UNITS

Scale, 1 to—	Miles per inch	Kilometers per inch	Feet per inch	Inches per mile	Inches per kilometer
500000	7.891	12.700	41,666	0.1267	0.07874
250000	3.945	6.350	20,833	.2534	.15748
125000	1.972	3.175	10,416	.5068	.31496
100000	1.578	2.540	8,333	.6336	.39370
63360	1.000	1.609	5,280	1.000	.6213
62500	.986	1.587	5,208	1.0137	.6299
40000	.6313	1.016	3,333	1.584	.9842
31680	.500	.804	2,640	2.000	1.2427
25000	.3945	.635	2,083	2.534	1.5748
20000	.3156	.508	1,666	3.168	1.9685
10000	.15782	.254	833.3	6.336	3.937
2500	.0394	.0635	208.3	25.34	15.748
1200	.0189	.0305	100	52.8	32.808

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TABLE XLV

MINUTES INTO DECIMALS OF A DEGREE

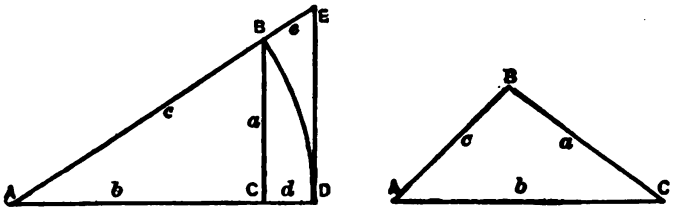
′	0″	10″	15″	20″	30″	40″	45″	50″	′
0	.00000	.00278	.00417	.00556	.00833	.01111	.01250	.01389	0
1	.01667	.01944	.02083	.02222	.02500	.02778	.02917	.03056	1
2	.03333	.03611	.03750	.03889	.04167	.04444	.04583	.04722	2
3	.05000	.05278	.05417	.05556	.05833	.06111	.06250	.06389	3
4	.06667	.06944	.07083	.07222	.07500	.07778	.07917	.08056	4
5	.08333	.08611	.08750	.08889	.09167	.09444	.09583	.09722	5
6	.10000	.10278	.10417	.10556	.10833	.11111	.11250	.11389	6
7	.11667	.11944	.12083	.12222	.12500	.12778	.12917	.13056	7
8	.13333	.13611	.13750	.13889	.14167	.14444	.14583	.14722	8
9	.15000	.15278	.15417	.15556	.15833	.16111	.16250	.16389	9
10	.16667	.16944	.17083	.17222	.17500	.17778	.17917	.18056	10
11	.18333	.18611	.18750	.18889	.19167	.19444	.19583	.19722	11
12	.20000	.20278	.20417	.20556	.20833	.21111	.21250	.21389	12
13	.21667	.21944	.22083	.22222	.22500	.22778	.22917	.23056	13
14	.23333	.23611	.23750	.23889	.24167	.24444	.24583	.24722	14
15	.25000	.25278	.25417	.25556	.25833	.26111	.26250	.26389	15
16	.26667	.26944	.27083	.27222	.27500	.27778	.27917	.28056	16
17	.28333	.28611	.28750	.28889	.29167	.29444	.29583	.29722	17
18	.30000	.30278	.30417	.30556	.30833	.31111	.31250	.31389	18
19	.31667	.31944	.32083	.32222	.32500	.32778	.32917	.33056	19
20	.33333	.33611	.33750	.33889	.34167	.34444	.34583	.34722	20
21	.35000	.35278	.35417	.35556	.35833	.36111	.36250	.36389	21
22	.36667	.36944	.37083	.37222	.37500	.37778	.37917	.38056	22
23	.38333	.38611	.38750	.38889	.39167	.39444	.39583	.39722	23
24	.40000	.40278	.40417	.40556	.40833	.41111	.41250	.41389	24
25	.41667	.41944	.42083	.42222	.42500	.42778	.42917	.43056	25
26	.43333	.43611	.43750	.43889	.44167	.44444	.44583	.44722	26
27	.45000	.45278	.45417	.45556	.45833	.46111	.46250	.46389	27
28	.46667	.46944	.47083	.47222	.47500	.47778	.47917	.48056	28
29	.48333	.48611	.48750	.48889	.49167	.49444	.49583	.49722	29
30	.50000	.50278	.50417	.50556	.50833	.51111	.51250	.51389	30
31	.51667	.51944	.52083	.52222	.52500	.52778	.52917	.53056	31
32	.53333	.53611	.53750	.53889	.54167	.54444	.54583	.54722	32
33	.55000	.55278	.55417	.55556	.55833	.56111	.56250	.56389	33
34	.56667	.56944	.57083	.57222	.57500	.57778	.57917	.58056	34
35	.58333	.58611	.58750	.58889	.59167	.59444	.59583	.59722	35
36	.60000	.60278	.60417	.60556	.60833	.61111	.61250	.61389	36
37	.61667	.61944	.62083	.62222	.62500	.62778	.62917	.63056	37
38	.63333	.63611	.63750	.63889	.64167	.64444	.64583	.64722	38
39	.65000	.65278	.65417	.65556	.65833	.66111	.66250	.66389	39
40	.66667	.66944	.67083	.67222	.67500	.67778	.67917	.68056	40
41	.68333	.68611	.68750	.68889	.69167	.69444	.69583	.69722	41
42	.70000	.70278	.70417	.70556	.70833	.71111	.71250	.71389	42
43	.71667	.71944	.72083	.72222	.72500	.72778	.72917	.73056	43
44	.73333	.73611	.73750	.73889	.74167	.74444	.74583	.74722	44
45	.75000	.75278	.75417	.75556	.75833	.76111	.76250	.76389	45
46	.76667	.76944	.77083	.77222	.77500	.77778	.77917	.78056	46
47	.78333	.78611	.78750	.78889	.79167	.79444	.79583	.79722	47
48	.80000	.80278	.80417	.80556	.80833	.81111	.81250	.81389	48
49	.81667	.81944	.82083	.82222	.82500	.82778	.82917	.83056	49
50	.83333	.83611	.83750	.83889	.84167	.84444	.84583	.84722	50
51	.85000	.85278	.85417	.85556	.85833	.86111	.86250	.86389	51
52	.86667	.86944	.87083	.87222	.87500	.87778	.87917	.88056	52
53	.88333	.88611	.88750	.88889	.89167	.89444	.89583	.89722	53
54	.90000	.90278	.90417	.90556	.90833	.91111	.91250	.91389	54
55	.91667	.91944	.92083	.92222	.92500	.92778	.92917	.93056	55
56	.93333	.93611	.93750	.93889	.94167	.94444	.94583	.94722	56
57	.95000	.95278	.95417	.95556	.95833	.96111	.96250	.96389	57
58	.96667	.96944	.97083	.97222	.97500	.97778	.97917	.98056	58
59	.98333	.98611	.98750	.98889	.99167	.99444	.99583	.99722	59
′	0″	10″	15″	20″	30″	40″	45″	50″	′

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TABLE XLVI

USEFUL CONSTANTS AND FORMULAE

1. Solution of triangles.



SOLUTION OF RIGHT TRIANGLES

1. $\sin A = \frac{a}{c} = \cos B$
2. $\cos A = \frac{b}{c} = \sin B$
3. $\tan A = \frac{a}{b} = \cot B$
4. $\cot A = \frac{b}{a} = \tan B$
5. $\sec A = \frac{c}{b} = \operatorname{cosec} B$
6. $\operatorname{cosec} A = \frac{c}{a} = \sec B$
7. $\operatorname{vers} A = \frac{c-b}{c} = \frac{d}{c}$
8. $\operatorname{exsec} A = \frac{e}{c}$
9. $a = c \sin A = b \tan A = c \cos B = b \cot B = \sqrt{(c+b)(c-b)}$
10. $b = c \cos A = a \cot A = c \sin B = a \tan B = \sqrt{(c+a)(c-a)}$
11. $d = c \operatorname{vers} A$
12. $e = c \operatorname{exsec} A$
13. $c = \frac{a}{\cos B} = \frac{b}{\sin B} = \frac{a}{\sin A} = \frac{b}{\cos A} = \frac{d}{\operatorname{vers} A} = \frac{e}{\operatorname{exsec} A}$

SOLUTION OF OBLIQUE TRIANGLES

Given	Sought	Formulas
14. A, B, a	b, c	$b = \frac{a}{\sin A} \cdot \sin B.$ $c = \frac{a}{\sin A} \sin (A+B)$
15. A, a, b	B, c	$\sin B = \frac{\sin A}{a} \cdot b.$ $c = \frac{a}{\sin a} \cdot \sin C.$
16. C, a, b	A−B	$\tan \frac{1}{2}(A-B) = \frac{a-b}{a+b} \tan \frac{1}{2}(A+B)$
17. a, b, c	A	Let $s = \frac{1}{2}(a+b+c)$; $\sin \frac{1}{2} A = \sqrt{\frac{(s-b)(s-c)}{bc}}$
18.		$\cos \frac{1}{2} A = \sqrt{\frac{s(s-a)}{bc}}$; $\tan \frac{1}{2} A = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$
19.		$\sin A = \frac{2\sqrt{s(s-a)(s-b)(s-c)}}{bc}$;
20.		$\operatorname{vers} A = \frac{2(s-b)(s-c)}{bc}$
21.	area	$\text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
22. A, B, C, a	area	$\text{area} = \frac{a^2 \sin B \cdot \sin C}{2 \sin A}$
23. C, a, b	area	$\text{area} = \frac{1}{2} a b \sin C.$

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a. Trigonometrical formulas.—The six most usual trigonometrical functions are the ratios defined for a right-angled triangle, as follows:

$$\text{sine}=\frac{\text{opposite side}}{\text{hypotenuse}}$$

$$\text{cosine}=\frac{\text{adjacent side}}{\text{hypotenuse}}$$

$$\text{tangent}=\frac{\text{opposite side}}{\text{adjacent side}}$$

$$\text{cotangent}=\frac{\text{adjacent side}}{\text{opposite side}}$$

$$\text{secant}=\frac{\text{hypotenuse}}{\text{adjacent side}}$$

$$\text{cosecant}=\frac{\text{hypotenuse}}{\text{opposite side}}$$

Right-angled triangles can be solved by the above and oblique triangles may be solved by the use of the additional relations for any triangle

$$\frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C}$$

$$\frac{a-b}{a+b}=\frac{\tan \tfrac{1}{2}(A-B)}{\tan \tfrac{1}{2}(A+B)}$$

and the group

$$a^2=b^2+c^2-2bc \cos A$$
$$b^2=a^2+c^2-2ac \cos B$$
$$c^2=a^2+b^2-2ab \cos C$$

Where A, B, and C are the angles and a, b, and c are the sides opposite to these angles, respectively.

b. Fundamental relations.

$$\sin A=\frac{1}{\csc A};\ \cos A=\frac{1}{\sec A};\ \tan A=\frac{1}{\cot A}=\frac{\sin A}{\cos A}$$

$$\csc A=\frac{1}{\sin A};\ \sec A=\frac{1}{\cos A};\ \cot A=\frac{1}{\tan A}=\frac{\cos A}{\sin A}$$

$$\sin^2 A+\cos^2 A=1;\ \sec^2 A-\tan^2 A=1;\ \csc^2 A-\cot^2 A=1$$

c. Functions of multiple angles.

$$\sin 2A=2 \sin A \cos A$$
$$\cos 2A=2 \cos^2 A-1=1-2 \sin^2 A=\cos^2 A-\sin^2 A$$
$$\sin 3A=3 \sin A-4 \sin^3 A;$$
$$\cos 3A=4 \cos^3 A-3 \cos A$$

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d. Functions of half angles.

$$\sin\frac{A}{2}=\pm\sqrt{\frac{1-\cos A}{2}} \qquad \cos\frac{A}{2}=\pm\sqrt{\frac{1+\cos A}{2}}$$

$$\tan\frac{A}{2}=\pm\frac{1-\cos A}{\sin A}=\frac{\sin A}{1+\cos A}=\pm\sqrt{\frac{1-\cos A}{1+\cos A}}$$

Powers of functions.

$\sin^2 A=\frac{1}{2}(1-\cos 2A)$; $\cos^2 A=\frac{1}{2}(1+\cos 2A)$
$\sin^3 A=\frac{1}{4}(3\sin A-\sin 3A)$; $\cos^3 A=\frac{1}{4}(\cos 3A+3\cos A)$

e. Sum and difference of angles.

$\sin(A\pm B)=\sin A\cos B\pm\cos A\sin B$
$\cos(A\pm B)=\cos A\cos B\mp\sin A\sin B$

$$\tan(A\pm B)=\frac{\tan A\pm\tan B}{1\mp\tan A\tan B}$$

f. Sums, differences, and products of functions.

$\sin A\pm\sin B=2\sin\frac{1}{2}(A\pm B)\cos\frac{1}{2}(A\mp B)$
$\cos A+\cos B=2\cos\frac{1}{2}(A+B)\cos\frac{1}{2}(A-B)$
$\cos A-\cos B=-2\sin\frac{1}{2}(A+B)\sin\frac{1}{2}(A-B)$

$$\tan A\pm\tan B=\frac{\sin(A\pm B)}{\cos A\cos B}$$

$\sin^2 A-\sin^2 B=\sin(A+B)\sin(A-B)$
$\cos^2 A-\cos^2 B=-\sin(A+B)\sin(A-B)$
$\cos^2 A-\sin^2 B=\cos(A+B)\cos(A-B)$
$\sin A\sin B=\frac{1}{2}\cos(A-B)-\frac{1}{2}\cos(A+B)$
$\cos A\cos B=\frac{1}{2}\cos(A-B)+\frac{1}{2}\cos(A+B)$
$\sin A\cos B=\frac{1}{2}\sin(A+B)+\frac{1}{2}\sin(A-B)$

The relations for angles greater than 90° are shown in the following tabulation where x represents an angle in the first quadrant where all the functions are positive.

angle	sine	cosine	tangent	cotangent
x	+ sin x	+ cos x	+ tan x	+ cot x
90°+x	+ cos x	− sin x	− cot x	− tan x
180°+x	− sin x	− cos x	+ tan x	+ cot x
270°+x	− cos x	+ sin x	− cot x	− tan x

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2. General formulae:

24. $\sin A = 2 \sin \frac{1}{2} A \cos \frac{1}{2} A = \sqrt{1-\cos^2 A} = \tan A \cos A$

25. $\cos A = 2 \cos^2 \frac{1}{2} A - 1 = 1 - 2 \sin^2 \frac{1}{2} A = \cos^2 \frac{1}{2} A - \sin^2 \frac{1}{2} A$

26. $\tan A = \frac{\sin A}{\cos A} = \frac{\sin 2A}{1+\cos 2A}$

27. $\cot A = \frac{\cos A}{\sin A} = \frac{\sin 2A}{1-\cos 2A} = \frac{\sin 2A}{\text{vers } 2A}$

28. $\text{vers } A = 1 - \cos A = \sin A \tan \frac{1}{2} A = 2 \sin^2 \frac{1}{2} A$

29. $\text{exsec } A = \sec A - 1 = \tan A \tan \frac{1}{2} A = \frac{\text{vers } A}{\cos A}$

30. $\sin 2A = 2 \sin A \cos A$

31. $\cos 2A = 2 \cos^2 A - 1 = \cos^2 A - \sin^2 A = 1 - 2 \sin^2 A$

32. $\tan 2A = \frac{2 \tan A}{1-\tan^2 A}$

33. $\cot 2A = \frac{\cot^2 A - 1}{2 \cot A}$

34. $\text{vers } 2A = 2 \sin^2 A = 2 \sin A \cos A \tan A$

35. $\text{exsec } 2A = \frac{2 \tan^2 A}{1-\tan^2 A}$

36. $\sin^2 A + \cos^2 A = 1$

37. $\sin (A \pm B) = \sin A \cdot \cos B \pm \sin B \cdot \cos A$

38. $\cos (A \pm B) = \cos A \cdot \cos B \pm \sin A \cdot \sin B$

39. $\sin A + \sin B = 2 \sin \frac{1}{2} (A+B) \cos \frac{1}{2} (A-B)$

40. $\sin A - \sin B = 2 \cos \frac{1}{2} (A+B) \sin \frac{1}{2} (A-B)$

41. $\cos A + \cos B = 2 \cos \frac{1}{2} (A+B) \cos \frac{1}{2} (A-B)$

42. $\cos B - \cos A = 2 \sin \frac{1}{2} (A+B) \sin \frac{1}{2} (A-B)$

43. $\sin^2 A - \sin^2 B = \cos^2 B - \cos^2 A = \sin (A+B) \sin (A-B)$

44. $\cos^2 A - \sin^2 B = \cos (A+B) \cos (A-B)$

45. $\tan A + \tan B = \frac{\sin (A+B)}{\cos A \cdot \cos B}$

46. $\tan A - \tan B = \frac{\sin (A-B)}{\cos A \cdot \cos B}$

47. $\sin 3A = 3 \sin A - 4 \sin^3 A$

48. $\cos 3A = 4 \cos^3 A - 3 \cos A$

49. $\sin \frac{A}{2} = \pm \sqrt{\frac{1-\cos A}{2}}$

50. $\cos \frac{A}{2} = \pm \sqrt{\frac{1+\cos A}{2}}$

51. $\tan \frac{A}{2} = \pm \frac{1-\cos A}{\sin A} = \frac{\sin A}{1+\cos A} = \pm \sqrt{\frac{1-\cos A}{1+\cos A}}$

52. $\sin^2 A = \frac{1}{2} (1 - \cos 2A)$

53. $\cos^2 A = \frac{1}{2} (1 + \cos 2A)$

54. $\sin^3 A = \frac{1}{4} (3 \sin A - \sin 3A)$

55. $\cos^3 A = \frac{1}{4} (\cos 3A + 3 \cos A)$

56. $\sin A \sin B = \frac{1}{2} \cos (A-B) - \frac{1}{2} \cos (A+B)$

57. $\cos A \cos B = \frac{1}{2} \cos (A-B) + \frac{1}{2} \cos (A+B)$

58. $\sin A \cos B = \frac{1}{2} \sin (A+B) + \frac{1}{2} \sin A - B$

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3. Functions of common angles.

	0°	30°	45°	60°	90°	120°	135°	150°	180°	270°
Sine	0	$\frac{1}{2}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}\sqrt{3}$	1	$\frac{1}{2}\sqrt{3}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}$	0	−1
Cosine	1	$\frac{1}{2}\sqrt{3}$	$\frac{1}{2}\sqrt{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{1}{2}\sqrt{2}$	$-\frac{1}{2}\sqrt{3}$	−1	0
Tangent	0	$\frac{1}{3}\sqrt{3}$	1	$\sqrt{3}$	$\pm\infty$	$-\sqrt{3}$	−1	$-\frac{1}{3}\sqrt{3}$	0	$\pm\infty$
Cotangent	$\pm\infty$	$\sqrt{3}$	1	$\frac{1}{3}\sqrt{3}$	0	$-\frac{1}{3}\sqrt{3}$	−1	$-\sqrt{3}$	$\pm\infty$	0
Secant	1	$\frac{2}{3}\sqrt{3}$	$\sqrt{2}$	2	$\pm\infty$	−2	$-\sqrt{2}$	$-\frac{2}{3}\sqrt{3}$	−1	$\pm\infty$
Cosecant	$\pm\infty$	2	$\sqrt{2}$	$\frac{2}{3}\sqrt{3}$	1	$\frac{2}{3}\sqrt{3}$	$\sqrt{2}$	2	$\pm\infty$	−1

4. Other useful relations.

Lineal feet	×.00019	=miles.
Lineal yards	×.0006	=miles.
Square inches	×.007	=square feet.
Square feet	×.111	=square yards.
Square yards	×.0002067	=acres.
Acres	×.4840	=square yards.
Cubic inches	×.00058	=cubic feet.
Cubic feet	×.03704	=cubic yards.
Links	×.22	=yards.
Links	×.66	=feet.
Feet	×1.5	=links.

$360° = 21600' = 1296000''$.

Radius = arc of 57.2957790°.

Arc of 1° (radius = 1) = .017453292.

Arc of 1′ (radius = 1) = .000290888.

Arc of 1″ (radius = 1) = .000004848.

Area of sector of circle (length of arc = L; r = radius) ..... $\frac{1}{2}$ Lr.

Area of segment of parabola (c = chord; m = mid. ord.) ..... $\frac{2}{3}$ cm.

Area of segment of circle (ap.) ..... $\frac{2}{3}$ cm.

$\pi = 3.141592654.$

$\frac{\pi}{4} = 0.785398163.$

$\frac{\pi}{6} = 0.523598776.$

$\sqrt{\frac{4}{\pi}} = 1.128379167.$

$\frac{4\pi}{3} = 4.188790205.$

$\sqrt[3]{\frac{6}{\pi}} = 1.240700982.$

$\pi^2 = 9.869604401.$

$\frac{1}{\pi^2} = 0.101321184.$

$\sqrt{\pi} = 1.772453851.$

$\frac{1}{\pi} = 0.3183099.$

Curvature of Earth's surface = about 0.7 foot in 1 mile.

Curvature in feet = 0.667 (dist. in miles)^2.

Difference between arc and chord length, 0.02 foot in 11½ miles.

1 radian $= \frac{180°}{\pi} = 57.2957790° = 57°17'44.8''$ nearly.

1 radian = 1018.6 mile.

1 degree = 0.0174533 radians.

1 minute = 0.0002909 radians.

1 mil = 0.0009817 radians.

π radians = 180°.

$\frac{\pi}{2}$ radians = 90°.

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$\frac{\pi}{6}$radians$=30°$.

$\frac{\pi}{3}$radians$=60°$.

$\frac{2\pi}{3}$radians$=120°$.

$\frac{3\pi}{2}$radians$=270°$.

2π radians$=360°$.

Degrees$\times\frac{\pi}{180}$=radians.

Radians$\times\frac{180}{\pi}$=degrees.

Angle in radians$\times$radius of circle=length of subtended arc.

	Number	Logarithm
Length of seconds pendulum at New York (inches)	39.1017	1.592196
Acceleration in one second due to gravity at New York (g), in feet	32.15949	1.507309
Cubic inches in 1 United States gallon	231.	2.363612
Cubic inches in 1 imperial gallon	277.274	2.442909
United States gallons in 1 cubic foot	7.4805	0.873931
Imperial gallons in 1 cubic foot	6.2321	0.794634
Feet in 1 meter	3.280833	0.515984
Inches in 1 meter	39.37	1.595165
Miles in 1 kilometer	0.62137	9.793350
Square feet in 1 square meter	10.7639	1.031968
Cubic feet in 1 cubic meter	35.3145	1.547953
Feet in 1 mile	5280.	3.722634
Square feet in 1 acre	43560.	4.639088

Error in chaining of 0.01 foot in 100 feet:

Due to—

1. Length of tape error of 0.01 foot.
2. Alignment. One end 1.4 feet out of line.
3. Sag of tape at center of 0.61 foot.
4. Temperature difference of 15°.
5. Difference of pull of 15 pounds.

Dimensions of the earth according to Clarke's spheroid of reference (1866):

Equatorial radius, a, = 6378206.4 meters

log. a = 6.80469857

Polar semi-axis, b, = 6356583.8 meters

log. b = 6.80322378

Eccentricity, e, $=\sqrt{\frac{a^2-b^2}{a^2}}$

$e^2=0.006768658$

log. $e^2=7.83050257-10$

Base of Naperian logarithms, ϵ, = 2.71828183

log. $\epsilon=0.43429448$

Modulus of common logarithms, M, = 0.43429448

log. M = 9.63778431 − 10

log. sin $1''=4.68557487-10$

log. tan $1''=4.68557487-10$

log. cosec $1''=5.3144251$

1 kilometer = 0.621370 statute mile = 0.539593 nautical mile.

1 meter = 0.000621370 statute mile = 0.000539593 nautical mile.

1 statute mile = 1609.35 meters = 1.60935 kilometers.

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1 nautical mile = 1853.25 meters = 1.85325 kilometers.
1 nautical mile = 1.151553 statute miles.
1 statute mile = 0.868393 nautical mile.
1 meter = 39.37 inches (law of July 28, 1886).
1 meter = 3.28083333 feet.
log. 3.28083333 = 0.51598417
1 foot = 0.30480061 meter.
log. 0.30480061 = 9.48401583 − 10
If n = the number of the observations.
v = the difference between any one observation and the mean of all the observations. (There are as many such differences as there are observations.)

Probable error of an observation, $r = 0.6745\sqrt{\frac{\Sigma v^2}{n-1}}$

Probable error of result, $r_o = \frac{r}{\sqrt{n}} = 0.6745\sqrt{\frac{\Sigma x^2}{n(n-1)}}$

Probable error of an observation of unit weight, $\mu_1 = 0.6745\sqrt{\frac{\Sigma pv^2}{n-1}}$

Probable error of an observation of weight $p_1, r_1 = \frac{\mu_1}{\sqrt{p_1}} = 0.6745\sqrt{\frac{\Sigma pv^2}{p_1(n-1)}}$

Probable error of an observed direction, $d = 0.6745\sqrt{\frac{\Sigma v^2}{c}}$ where Σv^2 = sum of squares of corrections to directions, and c is the number of conditions.

Mean error of an angle, $\alpha = \sqrt{\frac{\Sigma \Delta^2}{3n}}$,

where $\Sigma \Delta^2$ is the sum of the squares of the closing errors of the triangles, and n is the number of triangles.

TABLE XLVII

GREEK ALPHABET

Caps	Lower case	Greek name	English sound	Caps	Lower case	Greek name	English sound
A	α	Alpha	A	N	ν	Nu	N
B	β $\mathcal{6}$	Beta	B	Ξ	ξ	Xi	X
Γ	γ	Gamma	G	O	o	Omicron	O short
Δ	δ	Delta	D	Π	π ϖ	Pi	P
E	ϵ	Epsilon	E short	P	ρ	Rho	R
Z	ζ	Zeta	Z	Σ	σ s	Sigma	S
H	η	Eta	E long	T	τ	Tau	T
Θ	θ ϑ	Theta	Th	Υ	υ	Upsilon	U
I	ι	Iota	I	Φ	ϕ	Phi	F
K	κ	Kappa	K	X	χ	Chi	Ch
Λ	λ	Lambda	L	Ψ	ψ $\mathcal{8}$	Psi	Ps
M	μ	Mu	M	Ω	ω	Omega	O long

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TABLE XLVIII

LENGTHS OF CIRCULAR ARCS FOR UNIT RADIUS

By the use of this table, the length of any arc may be found if the length of the radius and the angle of the segment are known. *Example:* Required the length of arc of segment of 32°15′27″ with radius of 24 feet 3 inches.

From table: Length of arc (radius 1) for 32° = .5585054
15′ = .0043633
27″ = .0001309
.5629996

.5629996 × 24.25 (length of radius) = 13.65 feet.

Degrees						Minutes		Seconds	
°		°		°		′		″	
1	.017 4533	61	1.064 6508	121	2.111 8484	1	.000 2909	1	.000 0048
2	.034 9066	62	1.082 1041	122	2.129 3017	2	.000 5818	2	.000 0097
3	.052 3599	63	1.099 5574	123	2.146 7550	3	.000 8727	3	.000 0145
4	.069 8132	64	1.117 0107	124	2.164 2083	4	.001 1636	4	.000 0194
5	.087 2665	65	1.134 4640	125	2.181 6616	5	.001 4544	5	.000 0242
6	.104 7198	66	1.151 9173	126	2.199 1149	6	.001 7453	6	.000 0291
7	.122 1730	67	1.169 3706	127	2.216 5682	7	.002 0362	7	.000 0339
8	.139 6263	68	1.186 8239	128	2.234 0214	8	.002 3271	8	.000 0388
9	.157 0796	69	1.204 2772	129	2.251 4747	9	.002 6180	9	.000 0436
10	.174 5329	70	1.221 7305	130	2.268 9280	10	.002 9089	10	.000 0485
11	.191 9862	71	1.239 1838	131	2.286 3813	11	.003 1998	11	.000 0533
12	.209 4395	72	1.256 6371	132	2.303 8346	12	.003 4907	12	.000 0582
13	.226 8928	73	1.274 0904	133	2.321 2879	13	.003 7815	13	.000 0630
14	.244 3461	74	1.291 5436	134	2.338 7412	14	.004 0724	14	.000 0679
15	.261 7994	75	1.308 9969	135	2.356 1945	15	.004 3633	15	.000 0727
16	.279 2527	76	1.326 4502	136	2.373 6478	16	.004 6542	16	.000 0776
17	.296 7060	77	1.343 9035	137	2.391 1011	17	.004 9451	17	.000 0824
18	.314 1593	78	1.361 3568	138	2.408 5544	18	.005 2360	18	.000 0873
19	.331 6126	79	1.378 8101	139	2.426 0077	19	.005 5269	19	.000 0921
20	.349 0659	80	1.396 2634	140	2.443 4610	20	.005 8178	20	.000 0970
21	.366 5191	81	1.413 7167	141	2.460 9142	21	.006 1087	21	.000 1018
22	.383 9724	82	1.431 1700	142	2.478 3675	22	.006 3995	22	.000 1067
23	.401 4257	83	1.448 6233	143	2.495 8208	23	.006 6904	23	.000 1115
24	.418 8790	84	1.466 0766	144	2.513 2741	24	.006 9813	24	.000 1164
25	.436 3323	85	1.483 5299	145	2.530 7274	25	.007 2722	25	.000 1212
26	.453 7856	86	1.500 9832	146	2.548 1807	26	.007 5631	26	.000 1261
27	.471 2389	87	1.518 4364	147	2.565 6340	27	.007 8540	27	.000 1309
28	.488 6922	88	1.535 8897	148	2.583 0873	28	.008 1449	28	.000 1357
29	.506 1455	89	1.553 3430	149	2.600 5406	29	.008 4358	29	.000 1406
30	.523 5988	90	1.570 7963	150	2.617 9939	30	.008 7266	30	.000 1454
31	.541 0521	91	1.588 2496	151	2.635 4472	31	.009 0175	31	.000 1503
32	.558 5054	92	1.605 7029	152	2.652 9005	32	.009 3084	32	.000 1551
33	.575 9587	93	1.623 1562	153	2.670 3538	33	.009 5993	33	.000 1600
34	.593 4119	94	1.640 6095	154	2.687 8070	34	.009 8902	34	.000 1648
35	.610 8652	95	1.658 0628	155	2.705 2603	35	.010 1811	35	.000 1697
36	.628 3185	96	1.675 5161	156	2.722 7136	36	.010 4720	36	.000 1745
37	.645 7718	97	1.692 9694	157	2.740 1669	37	.010 7629	37	.900 1794
38	.663 2251	98	1.710 4227	158	2.757 6202	38	.011 0538	38	.000 1842
39	.680 6784	99	1.727 8760	159	2.775 0735	39	.011 3446	39	.000 1891
40	.698 1317	100	1.745 3293	160	2.792 5268	40	.011 6355	40	.000 1939
41	.715 5850	101	1.762 7825	161	2.809 9801	41	.011 9264	41	.000 1988
42	.733 0383	102	1.780 2358	162	2.827 4334	42	.012 2173	42	.000 2036
43	.750 4916	103	1.797 6891	163	2.844 8867	43	.012 5082	43	.000 2085
44	.767 9449	104	1.815 1424	164	2.862 3400	44	.012 7991	44	.000 2133
45	.785 3982	105	1.832 5957	165	2.879 7933	45	.013 0900	45	.000 2182
46	.802 8515	106	1.850 0490	166	2.897 2466	46	.013 3809	46	.000 2230
47	.820 3047	107	1.867 5023	167	2.914 6999	47	.013 6717	47	.000 2279
48	.837 7580	108	1.884 9556	168	2.932 1531	48	.013 9626	48	.000 2327
49	.855 2113	109	1.902 4089	169	2.949 6064	49	.014 2535	49	.000 2376
50	.872 6646	110	1.919 8622	170	2.967 0597	50	.014 5444	50	.000 2424
51	.890 1179	111	1.937 3155	171	2.984 5130	51	.014 8353	51	.000 2473
52	.907 5712	112	1.954 7688	172	3.001 9663	52	.015 1262	52	.900 2521
53	.925 0245	113	1.972 2221	173	3.019 4196	53	.015 4171	53	.000 2570
54	.942 4778	114	1.989 6753	174	3.036 8729	54	.015 7080	54	.000 2618
55	.959 9311	115	2.007 1286	175	3.054 3262	55	.015 9989	55	.000 2666
56	.977 3844	116	2.024 5819	176	3.071 7795	56	.016 2897	56	.000 2715
57	.994 8377	117	2.042 0352	177	3.089 2328	57	.016 5806	57	.000 2763
58	1.012 2910	118	2.059 4885	178	3.106 6861	58	.016 8715	58	.000 2812
59	1.029 7443	119	2.076 9418	179	3.124 1394	59	.017 1624	59	.000 2860
60	1.047 1976	120	2.094 3951	180	3.141 5927	60	.017 4533	60	.000 2909

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TABLE XLIX

CORRECTIONS TO ΔY FOR MAGNIFICATION OF SCALE

(Correction is in yards per thousand yards. It is subtracted when determining actual distance and direction from map coordinates; it is added when converting data from observations or ground measurements into map coordinates.)

Latitude	Zone and longitude									
	° ′	°	° ′	°	° ′	°	° ′	°	° ′	°
	A, 68 30	69	69 30	70	70 30	71	71 30	72	72 30	73
	B, 76 30	77	77 30	78	78 30	79	79 30	80	80 30	81
	C, 84 30	85	85 30	86	86 30	87	87 30	88	88 30	89
	D, 92 30	93	93 30	94	94 30	95	95 30	96	96 30	97
	E, 100 30	101	101 30	102	102 30	103	103 30	104	104 30	105
	F, 108 30	109	109 30	110	110 30	111	111 30	112	112 30	113
	G, 116 30	117	117 30	118	118 30	119	119 30	120	120 30	121
°										
24	2.574	2.034	1.557	1.144	0.794	0.508	0.286	0.127	0.032	0.000
25	2.533	2.002	1.533	1.126	.782	.500	.281	.125	.031	.000
26	2.492	1.969	1.507	1.107	.769	.492	.277	.123	.031	.000
27	2.449	1.935	1.481	1.088	.756	.484	.272	.121	.030	.000
28	2.404	1.900	1.455	1.069	.742	.475	.267	.119	.030	.000
29	2.359	1.864	1.427	1.049	.728	.466	.262	.117	.029	.000
30	2.313	1.828	1.399	1.028	.714	.457	.257	.114	.029	.000
31	2.266	1.790	1.371	1.007	.699	.448	.252	.112	.028	.000
32	2.218	1.753	1.342	.986	.685	.438	.246	.110	.027	.000
33	2.169	1.714	1.312	.964	.670	.429	.241	.107	.027	.000
34	2.120	1.675	1.282	.942	.654	.419	.236	.105	.026	.000
35	2.070	1.635	1.252	.920	.639	.409	.230	.102	.026	.000
36	2.018	1.595	1.221	.897	.623	.399	.224	.100	.025	.000
37	1.967	1.554	1.190	.874	.607	.389	.219	.097	.024	.000
38	1.915	1.513	1.159	.851	.591	.378	.213	.095	.024	.000
39	1.863	1.472	1.127	.828	.575	.368	.207	.092	.023	.000
40	1.810	1.430	1.095	.804	.559	.358	.201	.089	.022	.000
41	1.757	1.388	1.063	.781	.542	.347	.195	.087	.022	.000
42	1.703	1.346	1.030	.757	.526	.336	.189	.084	.021	.000
43	1.650	1.303	.997	.733	.509	.326	.183	.081	.020	.000
44	1.596	1.261	.965	.709	.493	.315	.177	.079	.020	.000
45	1.542	1.218	.933	.685	.476	.305	.171	.076	.019	.000
46	1.488	1.176	.900	.661	.459	.294	.165	.073	.018	.000
47	1.435	1.133	.868	.638	.443	.283	.159	.071	.018	.000
48	1.381	1.091	.835	.614	.426	.273	.153	.068	.017	.000
49	1.328	1.049	.803	.590	.410	.262	.148	.066	.016	.000
50	1.274	1.007	.771	.566	.393	.252	.142	.063	.016	.000

234592°—40——17

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TABLE XLIX.—*Corrections to Δy for magnification of scale*—Continued

Latitude	Zone and longitude									
	°	° ′	°	° ′	°	° ′	°	° ′	°	° ′
	A, 73	73 30	74	74 30	75	75 30	76	76 30	77	77 30
	B, 81	81 30	82	82 30	83	83 30	84	84 30	85	85 30
	C, 89	89 30	90	90 30	91	91 30	92	92 30	93	93 30
	D, 97	97 30	98	98 30	99	99 30	100	100 30	101	101 30
	E, 105	105 30	106	106 30	107	107 30	108	108 30	109	109 30
	F, 113	113 30	114	114 30	115	115 30	116	116 30	117	117 30
	G, 121	121 30	122	122 30	123	123 30	124	124 30	125	125 30
°										
24	0.000	0.032	0.127	0.286	0.508	0.794	1.144	1.557	2.034	2.574
25	.000	.031	.125	.281	.500	.782	1.126	1.533	2.002	2.533
26	.000	.031	.123	.277	.492	.769	1.107	1.507	1.969	2.492
27	.000	.030	.121	.272	.484	.756	1,088	1.481	1.935	2.449
28	.000	.030	.119	.267	.475	.742	1.069	1.455	1.900	2,404
29	.000	.029	.117	.262	.466	.728	1.049	1.427	1.864	2.359
30	.000	.029	.114	.257	.457	.714	1.028	1.399	1.828	2.313
31	.000	.028	.112	.252	.448	.699	1.007	1.371	1.790	2.266
32	.000	.027	.110	.246	.438	.685	.986	1.342	1.753	2.218
33	.000	.027	.107	.241	.429	.670	.964	1.312	1.714	2.169
34	.000	.026	.105	.236	.419	.654	.942	1.282	1.675	2.120
35	.000	.026	.102	.230	.409	.639	.920	1.252	1.635	2.070
36	.000	.025	.100	.224	.399	.623	.897	1.221	1.595	2.018
37	.000	.024	.097	.219	.389	.607	.874	1.190	1.554	1.967
38	.000	.024	.095	.213	.378	.591	.851	1.159	1.513	1.915
39	.000	.023	.092	.207	.368	.575	.828	1.127	1.472	1.863
40	.000	.022	.089	.201	.358	.559	.804	1.095	1.430	1.810
41	.000	.022	.087	.195	.347	.542	.781	1.063	1.388	1.757
42	.000	.021	.084	.189	.336	.526	.757	1.030	1.346	1.703
43	.000	.020	.081	.183	.326	.509	.733	.997	1.303	1.650
44	.000	.020	.079	.177	.315	.493	.709	.965	1.261	1.596
45	.000	.019	.076	.171	.305	.476	.685	.933	1.218	1.542
46	.000	.018	.073	.165	.294	.459	.661	.900	1.176	1.488
47	.000	.018	.071	.159	.283	.443	.638	.868	1.133	1.435
48	.000	.017	.068	.153	.273	.426	.614	.835	1.091	1.381
49	.000	.016	.066	.148	.262	.410	.590	.803	1.049	1.328
50	.000	.016	.063	.142	.252	.393	.566	.771	1.007	1.274

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TABLE L

REDUCTION OF GEOGRAPHIC AZIMUTH TO GRID AZIMUTH

(Tabular value $= \lambda \sin \phi - \frac{1}{12}\lambda^3\left(\frac{\pi}{180}\right)^2 \sin 2\phi \cos \phi$; λ = distance in degrees from the central meridian; ϕ = latitude)

Latitude	Zone and longitude											
	° 78 86 94 102 110 118 126	° 77 85 93 101 109 117 125	° 76 84 92 100 108 116 124	° 75 83 91 99 107 115 123	° 74 82 90 98 106 114 122	° 73 81 89 97 105 113 121	° 72 80 88 96 104 112 120	° 71 79 87 95 103 111 119	° 70 78 86 94 102 110 118	° 69 77 85 93 101 109 117	° A, 68 B, 76 C, 84 D, 92 E, 100 F, 108 G, 116	° 67
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
24	2 01 53	1 37 33	1 13 11	0 48 48	0 24 24	0 00 00	0 24 24	0 48 48	1 13 11	1 37 33	2 01 53	-------
25	06 39	41 22	16 03	50 42	25 21	00	25 21	50 42	16 03	41 22	06 39	-------
26	11 23	45 08	18 53	52 36	26 18	00	26 18	52 36	18 53	45 08	11 23	-------
27	16 04	48 53	21 41	54 28	27 14	00	27 14	54 28	21 41	48 53	16 04	-------
28	20 42	52 36	24 28	56 20	28 10	00	28 10	56 20	24 28	52 36	20 42	-------
29	25 18	56 17	27 14	58 10	29 05	00	29 05	58 10	27 14	56 17	25 18	-------
30	29 51	1 59 56	29 58	0 59 59	30 00	00	30 00	0 59 59	29 58	1 59 56	29 51	-------
31	34 22	2 03 32	32 40	1 01 48	30 54	00	30 54	1 01 48	32 40	2 03 32	34 22	-------
32	38 50	07 06	35 21	03 35	31 48	00	31 48	03 35	35 21	07 06	38 50	-------
33	43 15	10 38	38 00	05 21	32 41	00	32 41	05 21	38 00	10 38	43 15	-------
34	47 37	14 08	40 37	07 06	33 33	00	33 33	07 06	40 37	14 08	47 37	-------
35	51 56	17 35	43 13	08 49	34 25	00	34 25	08 49	43 13	17 35	51 56	-------
36	2 56 11	21 00	45 46	10 31	35 16	00	35 16	10 31	45 46	21 00	2 56 11	-------
37	3 00 24	24 22	48 18	12 12	36 06	00	36 06	12 12	48 18	24 22	3 00 24	-------
38	04 33	27 41	50 47	13 52	36 56	00	36 56	13 52	50 47	27 41	04 33	-------
39	08 39	30 58	53 15	15 30	37 45	00	37 45	15 30	53 15	30 58	08 39	-------
40	12 42	34 12	55 40	17 07	38 34	00	38 34	17 07	55 40	34 12	12 42	-------
41	16 40	37 23	1 58 04	18 43	39 22	00	39 22	18 43	1 58 04	37 23	16 40	-------
42	20 36	40 31	2 00 25	20 17	40 09	00	40 09	20 17	2 00 25	40 31	20 36	-------
43	24 28	43 36	02 44	21 50	40 55	00	40 55	21 50	02 44	43 36	24 28	-------
44	28 16	46 39	05 00	23 21	41 41	00	41 41	23 21	05 00	46 39	28 16	4 09 50
45	32 00	49 38	07 15	24 51	42 25	00	42 25	24 51	07 15	49 38	32 00	14 19
46	35 40	52 34	09 27	26 19	43 10	00	43 10	26 19	09 27	52 34	35 40	18 44
47	39 17	55 27	11 37	27 45	43 53	00	43 53	27 45	11 37	55 27	39 17	23 04
48	42 49	2 58 17	13 44	29 10	44 35	00	44 35	29 10	13 44	2 58 17	42 49	27 19
49	46 17	3 01 04	15 49	30 33	45 17	00	45 17	30 33	15 49	3 01 04	46 17	-------
50	49 42	03 47	17 52	31 55	45 58	00	45 58	31 55	17 52	03 47	49 42	-------

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TABLE LI

AGETON TABLE FOR MERIDIAN DETERMINATIONS

(This table is an abridged form of the Dead Reckoning Altitude and Azimuth Table, prepared by Lt. Arthur A. Ageton, United States Navy, and published by the United States Hydrographic Office as H. O. No. 211. It is reproduced here by the courtesy of that Bureau. Those desiring further information as to the derivation and other uses of the table are referred to the original publication.)

In the solution of navigational problems and the tabulation of data, the use of suitable abbreviations saves time and affords greater clarity. The following abbreviations are often used and will be found very convenient in practice:

a = Altitude difference (intercept).
AP = Airport.
AS = Air speed.
Bn = Beacon.
CC = Compass course.
CH = Compass heading.
Corr = Correction.
D = Drift angle.
D/F = Direction finding.
DR = Dead reckoning.
Dec = Declination.
+ = north dec.
− = south dec.
Dev = Deviation.
ETA = Estimated time of arrival.
G = Greenwich.
GCT = Greenwich civil time.
GHA = Greenwich hour angle.
GS = Ground speed.
GST = Greenwich sidereal time.
H_c = Computed altitude (from assumed or DR position).
HD = Hourly difference.
HE = Height of eye.
H_o = Observed altitude (sextant altitude corrected for refraction, etc.).
HP = Horizontal parallax.
H_s = Sextant altitude (uncorrected).
IC = Index correction.
Lat = Latitude.
LHA = Local hour angle.
Long = Longitude.
LP = Line of position.
M = Meridian of observer.
MC = Magnetic course.
MH = Magnetic heading.
mph = Miles per hour.
NA = Nautical Almanac.
O = Origin, or starting point.
Par = Parallax.
RA = Right ascension.
R/A = Radius of action.
RBn = Marine radiobeacon.
RC = Radio compass (naval radio direction finder station).
Ref = Refraction.
RM = Radio marker beacon.
RRa = Radio range station.
RS = Radio station (commercial broadcast).
SD = Semidiameter.
SP = Seaplane port.
TC = True course.
TH = True heading.
Var = Variation.
W = Wind (direction and velocity).
WC = Wind correction angle.
Z = Azimuth or bearing.
☽ = Moon.
* = Star.
☉ = Sun.
♈ = Vernal equinox (first point of Aries).

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	0°00′		1°00′		2°00′		3°00′		4°00′		5°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	-------	0.0	175814	6.6	145718	26.5	128120	59.6	115641	105.9	105970	165.6	60
1	353627	0.0	175097	6.8	145358	26.9	127880	60.2	115461	106.8	105826	166.7	59
2	323524	0.0	174391	7.1	145000	27.3	127640	60.9	115282	107.7	105683	167.8	58
3	305915	0.0	173696	7.3	144646	27.8	127403	61.6	115103	108.6	105539	168.9	57
4	293421	0.0	173012	7.5	144295	28.3	127166	62.2	114925	109.5	105397	170.0	56
5	283730	0.0	172339	7.8	143946	28.7	126931	62.9	114747	110.4	105254	171.1	55
6	275812	0.1	171676	8.0	143600	29.2	126697	63.6	114571	111.3	105113	172.3	54
7	269118	0.1	171023	8.2	143257	29.6	126465	64.3	114395	112.2	104971	173.4	53
8	263318	0.1	170379	8.5	142916	30.1	126233	65.0	114220	113.1	104830	174.5	52
9	258203	0.1	169745	8.7	142579	30.6	126003	65.7	114045	114.0	104690	175.7	51
10	253627	0.2	169121	9.0	142243	31.1	125774	66.4	113872	114.9	104550	176.8	50
11	249488	0.2	168505	9.3	141911	31.5	125546	67.1	113699	115.9	104411	178.0	49
12	245709	0.3	167897	9.5	141581	32.0	125320	67.8	113526	116.8	104272	179.1	48
13	242233	0.3	167298	9.8	141253	32.5	125094	68.5	113354	117.7	104133	180.3	47
14	239015	0.4	166708	10.1	140928	33.0	124870	69.2	113183	118.7	103995	181.4	46
15	236018	0.4	166125	10.3	140605	33.5	124647	69.9	113013	119.6	103857	182.6	45
16	233215	0.5	165550	10.6	140285	34.0	124425	70.6	112843	120.5	103720	183.7	44
17	230583	0.5	164982	10.9	139967	34.5	124204	71.3	112674	121.5	103583	184.9	43
18	228100	0.6	164422	11.2	139651	35.0	123985	72.1	112506	122.4	103447	186.1	42
19	225752	0.7	163868	11.5	139338	35.5	123766	72.8	112338	123.4	103311	187.2	41
20	223525	0.7	163322	11.8	139027	36.0	123549	73.5	112171	124.3	103175	188.4	40
21	221406	0.8	162783	12.1	138718	36.5	123332	74.3	112005	125.3	103040	189.6	39
22	219385	0.9	162250	12.4	138411	37.1	123117	75.0	111839	126.2	102905	190.8	38
23	217455	1.0	161724	12.7	138106	37.6	122903	75.8	111674	127.2	102771	192.0	37
24	215607	1.1	161204	13.0	137804	38.1	122690	76.5	111510	128.2	102637	193.2	36
25	213834	1.1	160690	13.3	137504	38.6	122478	77.3	111346	129.2	102504	194.4	35
26	212130	1.2	160182	13.6	137205	39.2	122267	78.0	111183	130.1	102371	195.6	34
27	210491	1.3	159680	13.9	136909	39.7	122057	78.8	111020	131.1	102238	196.8	33
28	208912	1.4	159184	14.2	136615	40.3	121848	79.5	110858	132.1	102106	198.0	32
29	207388	1.5	158693	14.6	136322	40.8	121639	80.3	110696	133.1	101974	199.2	31
30	205916	1.7	158208	14.9	136032	41.4	121432	81.1	110536	134.1	101843	200.4	30
31	204492	1.8	157728	15.2	135744	41.9	131226	81.9	110375	135.1	101712	201.6	29
32	203113	1.9	157254	15.6	135457	42.5	121021	82.6	110216	136.1	101581	202.8	28
33	201777	2.0	156784	15.9	135173	43.0	120817	83.4	110057	137.1	101451	204.1	27
34	200480	2.1	156320	16.2	134890	43.6	120614	84.2	109898	138.1	101321	205.3	26
35	199221	2.3	155861	16.6	134609	44.2	120412	85.0	109740	139.1	101192	206.5	25
36	197998	2.4	155406	16.9	134330	44.7	120211	85.8	109583	140.1	101063	207.8	24
37	196808	2.5	154956	17.3	134052	45.3	120010	86.6	109426	141.1	100934	209.0	23
38	195650	2.7	154511	17.6	133777	45.9	119811	87.4	109270	142.2	100806	210.3	22
39	194522	2.8	154070	18.0	133503	46.5	119612	88.2	109115	143.2	100678	211.5	21
40	193422	2.9	153633	18.4	133231	47.1	119415	89.0	108960	144.2	100550	212.8	20
41	192350	3.1	153201	18.7	132961	47.6	119218	89.8	108805	145.2	100423	214.0	19
42	191303	3.2	152774	19.1	132692	48.2	119022	90.6	108651	146.3	100296	215.3	18
43	190282	3.4	152350	19.5	132425	48.8	118827	91.4	108498	147.3	100170	216.5	17
44	189283	3.6	151931	19.9	132159	49.4	118633	92.3	108345	148.4	100044	217.8	16
45	188307	3.7	151515	20.3	131896	50.0	118440	93.1	108193	149.4	99918	219.1	15
46	187353	3.9	151104	20.6	131633	50.7	118248	93.9	108041	150.5	99793	220.3	14
47	186419	4.1	150696	21.0	131373	51.3	118056	94.7	107890	151.5	99668	221.6	13
48	185505	4.2	150292	21.4	131114	51.9	117866	95.6	107739	152.6	99544	222.9	12
49	184609	4.4	149892	21.8	130856	52.5	117676	96.4	107589	153.6	99420	224.2	11
50	183732	4.6	149495	22.2	130600	53.1	117487	97.3	107439	154.7	99296	225.5	10
51	182872	4.8	149103	22.6	130346	53.7	117299	98.1	107290	155.8	99172	226.8	9
52	182029	5.0	148713	23.1	130093	54.4	117112	99.0	107141	156.9	99049	228.1	8
53	181201	5.2	148327	23.5	129841	55.0	116925	99.8	106993	157.9	98926	229.4	7
54	180390	5.4	147945	23.9	129591	55.7	116739	100.7	106846	159.0	98804	230.7	6
55	179593	5.6	147566	24.3	129342	56.3	116554	101.6	106698	160.1	98682	232.0	5
56	178810	5.8	147190	24.7	129095	56.9	116370	102.4	106552	161.2	98560	233.3	4
57	178042	6.0	146817	25.2	128849	57.6	116187	103.3	106406	162.3	98439	234.6	3
58	177287	6.2	146448	25.6	128605	58.2	116004	104.2	106260	163.4	98318	235.9	2
59	176544	6.4	146081	26.0	128362	58.9	115823	105.0	106115	164.5	98197	237.2	1
60	175814	6.6	145718	26.5	128120	59.6	115641	105.9	105970	165.6	98076	238.6	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	179°00′		178°00′		177°00′		176°00′		175°00′		174°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	6°00′		7°00′		8°00′		9°00′		10°00′		11°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	98076	239	91411	325	85644	425	80567	538	76033	665	71940	805	60
1	97957	240	91308	326	85555	426	80487	540	75961	667	71875	808	59
2	97837	241	91205	328	85465	428	80407	542	75890	669	71810	810	58
3	97717	243	91103	330	85376	430	80328	544	75819	672	71746	813	57
4	97598	244	91001	331	85286	432	80249	546	75747	674	71681	815	56
5	97480	245	90899	333	85197	434	80170	548	75676	676	71616	818	55
6	97361	247	90798	334	85108	435	80091	550	75605	678	71552	820	54
7	97243	248	90696	336	85020	437	80012	552	75534	680	71488	823	53
8	97126	249	90595	337	84931	439	79933	554	75464	683	71423	825	52
9	97008	251	90494	339	84843	441	79855	556	75393	685	71359	828	51
10	96891	252	90394	341	84755	443	79777	558	75322	687	71295	830	50
11	96774	253	90293	342	84667	444	79698	560	75252	690	71231	833	49
12	96658	255	90193	344	84579	446	79620	562	75182	692	71167	835	48
13	96542	256	90093	345	84492	448	79542	564	75112	694	71104	838	47
14	96426	257	89994	347	84404	450	79465	566	75042	696	71040	840	46
15	96310	259	89894	349	84317	452	79387	568	74972	699	70976	843	45
16	96195	260	89795	350	84230	454	79309	570	74902	701	70913	845	44
17	96080	262	89696	352	84143	455	79232	573	74832	703	70850	848	43
18	95966	263	89597	353	84056	457	79155	575	74763	706	70786	850	42
19	95851	264	89499	355	83970	459	79078	577	74693	708	70723	853	41
20	95737	266	89401	357	83884	461	79001	579	74624	710	70660	855	40
21	95624	267	89303	358	83797	463	78924	581	74555	712	70597	858	39
22	95510	269	89205	360	83711	465	78847	583	74486	715	70534	860	38
23	95397	270	89107	362	83626	467	78771	585	74417	717	70471	863	37
24	95285	271	89010	363	83540	468	78694	587	74348	719	70409	865	36
25	95172	273	88913	365	83455	470	78618	589	74279	722	70346	868	35
26	95060	274	88816	366	83369	472	78542	591	74210	724	70284	870	34
27	94948	276	88719	368	83284	474	78466	593	74142	726	70221	873	33
28	94836	277	88623	370	83199	476	78390	595	74073	729	70159	876	32
29	94725	279	88526	371	83114	478	78315	598	74005	731	70097	878	31
30	94614	280	88430	373	83030	480	78239	600	73937	733	70034	881	30
31	94503	281	88334	375	82945	482	78164	602	73869	736	69972	883	29
32	94393	283	88239	376	82861	483	78088	604	73801	738	69910	886	28
33	94283	284	88143	378	82777	485	78013	606	73733	740	69849	888	27
34	94173	286	88048	380	82693	487	77938	608	73665	743	69787	891	26
35	94063	287	87953	381	82609	489	77863	610	73597	745	69725	894	25
36	93954	289	87858	383	82526	491	77788	612	73530	747	69664	896	24
37	93845	290	87764	385	82442	493	77714	615	73462	750	69602	899	23
38	93736	292	87669	387	82359	495	77639	617	73395	752	69541	901	22
39	93628	293	87575	388	82276	497	77565	619	73328	755	69479	904	21
40	93519	295	87481	390	82193	499	77491	621	73260	757	69418	907	20
41	93411	296	87387	392	82110	501	77417	623	73193	759	69357	909	19
42	93304	298	87294	393	82027	503	77343	625	73127	762	69296	912	18
43	93196	299	87201	395	81945	504	77269	627	73060	764	69235	914	17
44	93089	301	87107	397	81863	506	77195	630	72993	766	69174	917	16
45	92982	302	87015	399	81780	508	77122	632	72926	769	69113	920	15
46	92876	304	86922	400	81698	510	77048	634	72860	771	69053	922	14
47	92769	305	86829	402	81617	512	76975	636	72794	774	68992	925	13
48	92663	307	86737	404	81535	514	76902	638	72727	776	68931	928	12
49	92558	308	86645	405	81453	516	76828	641	72661	779	68871	930	11
50	92452	310	86553	407	81372	518	76756	643	72595	781	68811	933	10
51	92347	311	86461	409	81291	520	76683	645	72529	783	68750	935	9
52	92242	313	86370	411	81210	522	76610	647	72463	786	68690	938	8
53	92137	314	86278	412	81129	524	76537	649	72397	788	68630	941	7
54	92032	316	86187	414	81048	526	76465	652	72332	791	68570	943	6
55	91928	317	86096	416	80967	528	76393	654	72266	793	68510	946	5
56	91824	319	86006	418	80887	530	76320	656	72201	796	68450	949	4
57	91720	320	85915	419	80807	532	76248	658	72135	798	68391	951	3
58	91617	322	85825	421	80727	534	76176	660	72070	800	68331	954	2
59	91514	323	85734	423	80647	536	76105	663	72005	803	68272	957	1
60	91411	325	85644	425	80567	538	76033	665	71940	805	68212	960	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	173°00′		172°00′		171°00′		170°00′		169°00′		168°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	12°00′		13°00′		14°00′		15°00′		16°00′		17°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	68212	960	64791	1128	61632	1310	58700	1506	55966	1716	53406	1940	60
1	68153	962	64736	1130	61582	1313	58653	1509	55922	1719	53365	1944	59
2	68093	965	64682	1133	61531	1316	58606	1512	55878	1723	53324	1948	58
3	68034	968	64627	1136	61481	1319	58559	1516	55834	1727	53283	1952	57
4	67975	970	64573	1139	61430	1322	58512	1519	55790	1730	53241	1956	56
5	67916	973	64518	1142	61380	1325	58465	1523	55746	1734	53200	1960	55
6	67857	976	64464	1145	61330	1329	58418	1526	55703	1738	53159	1964	54
7	67798	978	64410	1148	61279	1332	58372	1529	55659	1741	53118	1967	53
8	67739	981	64356	1151	61229	1335	58325	1533	55615	1745	53077	1971	52
9	67681	984	64302	1154	61179	1338	58278	1536	55572	1749	53036	1975	51
10	67622	987	64248	1157	61129	1341	58232	1540	55528	1752	52995	1979	50
11	67563	989	64194	1160	61079	1344	58185	1543	55484	1756	52954	1983	49
12	67505	992	64140	1163	61029	1348	58138	1546	55441	1760	52914	1987	48
13	67447	995	64086	1166	60979	1351	58092	1550	55397	1763	52873	1991	47
14	67388	997	64032	1169	60929	1354	58046	1553	55354	1767	52832	1995	46
15	67330	1000	63978	1172	60879	1357	57999	1557	55311	1771	52791	1999	45
16	67272	1003	63925	1175	60830	1360	57953	1560	55267	1774	52751	2003	44
17	67214	1006	63871	1178	60780	1364	57907	1564	55224	1778	52710	2007	43
18	67156	1008	63818	1181	60730	1367	57860	1567	55181	1782	52670	2010	42
19	67098	1011	63764	1184	60681	1370	57814	1571	55138	1785	52629	2014	41
20	67040	1014	63711	1187	60631	1373	57768	1574	55095	1789	52588	2018	40
21	66982	1017	63658	1190	60582	1377	57722	1578	55051	1793	52548	2022	39
22	66925	1020	63605	1193	60533	1380	57676	1581	55008	1796	52508	2026	38
23	66867	1022	63551	1196	60483	1383	57630	1584	51965	1800	52467	2030	37
24	66810	1025	63498	1199	60434	1386	57584	1588	54922	1804	52427	2034	36
25	66752	1028	63445	1202	60385	1390	57538	1591	54880	1808	52387	2038	35
26	66695	1031	63392	1205	60336	1393	57493	1595	54837	1811	52346	2042	34
27	66638	1033	63340	1208	60287	1396	57447	1598	54794	1815	52306	2046	33
28	66580	1036	63287	1211	60238	1399	57401	1602	54751	1819	52266	2050	32
29	66523	1039	63234	1214	60189	1403	57356	1605	54708	1823	52226	2054	31
30	66466	1042	63181	1217	60140	1406	57310	1609	54666	1826	52186	2058	30
31	66409	1045	63129	1220	60091	1409	57265	1612	54623	1830	52146	2062	29
32	66352	1047	63076	1223	60042	1412	57219	1616	54581	1834	52106	2066	28
33	66296	1050	63024	1226	59994	1416	57174	1619	54538	1837	52066	2070	27
34	66239	1053	62971	1229	59945	1419	57128	1623	54496	1841	52026	2074	26
35	66182	1056	62919	1232	59896	1422	57083	1627	54453	1845	51986	2078	25
36	66126	1059	62867	1235	59848	1425	57038	1630	54411	1849	51946	2082	24
37	66069	1061	62815	1238	59800	1429	56992	1634	54368	1853	51906	2086	23
38	66013	1064	62763	1241	59751	1432	56947	1637	54326	1856	51867	2090	22
39	65957	1067	62711	1244	59703	1435	56902	1641	54284	1860	51827	2094	21
40	65900	1070	62659	1247	59654	1439	56857	1644	54242	1864	51787	2098	20
41	65844	1073	62607	1250	59606	1442	56812	1648	54199	1868	51747	2102	19
42	65788	1076	62555	1253	59558	1445	56767	1651	54157	1871	51708	2106	18
43	65732	1079	62503	1257	59510	1449	56722	1655	54115	1875	51668	2110	17
44	65676	1081	62451	1260	59462	1452	56677	1658	54073	1879	51629	2114	16
45	65620	1084	62400	1263	59414	1455	56632	1662	54031	1883	51589	2118	15
46	65564	1087	62348	1266	59366	1459	56588	1665	53989	1887	51550	2122	14
47	65509	1090	62296	1269	59318	1462	56543	1669	53947	1890	51510	2126	13
48	65453	1093	62245	1272	59270	1465	56498	1673	53905	1894	51471	2130	12
49	65398	1096	62194	1275	59222	1469	56454	1676	53864	1898	51432	2134	11
50	65342	1099	62142	1278	59175	1472	56409	1680	53822	1902	51392	2138	10
51	65287	1101	62091	1281	59127	1475	56365	1683	53780	1906	51353	2143	9
52	65231	1104	62040	1284	59079	1479	56320	1687	53738	1910	51314	2147	8
53	65176	1107	61989	1288	59032	1482	56276	1691	53697	1913	51275	2151	7
54	65121	1110	61938	1291	58984	1485	56231	1694	53655	1917	51236	2155	6
55	65066	1113	61887	1294	58937	1489	56187	1698	53614	1921	51197	2159	5
56	65011	1116	61836	1297	58889	1492	56143	1701	53572	1925	51158	2163	4
57	64956	1119	61785	1300	58842	1495	56099	1705	53531	1929	51119	2167	3
58	64901	1122	61734	1303	58795	1499	56054	1709	53489	1933	51080	2171	2
59	64846	1125	61683	1306	58748	1502	56010	1712	53448	1936	51041	2175	1
60	64791	1128	61632	1310	58700	1506	55966	1716	53406	1940	51002	2179	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	167°00′		166°00′		165°00′		164°00′		163°00′		162°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	18°00′		19°00′		20°00′		21°00′		22°00′		23°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	51002	2179	48736	2433	46595	2701	44567	2985	42642	3283	40812	3597	60
1	50963	2183	48699	2437	46560	2706	44534	2990	42611	3288	40782	3603	59
2	50924	2188	48662	2442	46525	2711	44501	2994	42580	3294	40753	3608	58
3	50885	2192	48626	2446	46491	2715	44468	2999	42549	3299	40723	3613	57
4	50846	2196	48589	2450	46456	2720	44436	3004	42518	3304	40693	3619	56
5	50808	2200	48553	2455	46422	2724	44403	3009	42486	3309	40664	3624	55
6	50769	2204	48516	4259	46387	2729	44370	3014	42455	3314	40634	3630	54
7	50730	2208	48480	2463	46353	2734	44337	3019	42424	3319	40604	3635	53
8	50692	2212	48443	2468	46318	2738	44305	3024	42393	3324	40575	3640	52
9	50653	2216	48407	2472	46284	2743	44272	3029	42362	3329	40545	3646	51
10	50615	2221	48371	2477	46249	2748	44239	3033	42331	3335	40516	3651	50
11	50576	2225	48334	2481	46215	2752	44207	3038	42300	3340	40486	3657	49
12	50538	2229	48298	2485	46181	2757	44174	3043	42269	3345	40457	3662	48
13	50499	2233	48262	2490	46146	2761	44142	3048	42238	3350	40427	3667	47
14	50461	2237	48225	2494	46112	2766	44109	3053	42207	3355	40398	3763	46
15	50423	2241	48189	2499	46078	2771	44077	3058	42176	3360	40368	3678	45
16	50385	2246	48153	2503	46043	2775	44044	3063	42145	3366	40339	3684	44
17	50346	2250	48117	2507	46009	2780	44012	3068	42115	3371	40310	3689	43
18	50308	2254	48081	2512	45975	2785	43979	3073	42084	3376	40280	3695	42
19	50270	2258	48045	2516	45941	2789	43947	3078	42053	3381	40251	3700	41
20	50232	2262	48009	2521	45907	2794	43914	3083	42022	3386	40222	3705	40
21	50194	2266	47973	2525	45873	2799	43882	3088	41991	3391	40192	3711	39
22	50156	2271	47937	2530	45839	2804	43850	3092	41961	3397	40163	3716	38
23	50117	2275	47901	2534	45805	2808	43818	3097	41930	3402	40134	3722	37
24	50080	2279	47865	2539	45771	2813	43785	3102	41899	3407	40105	3727	36
25	50042	2283	47829	2543	45737	2818	43753	3107	41869	3412	40076	3733	35
26	50004	2287	47793	2547	45703	2822	43721	3112	41838	3418	40046	3738	34
27	49966	2292	47758	2552	45669	2827	43689	3117	41808	3423	40017	3744	33
28	49928	2296	47722	2556	45635	2832	43657	3122	41777	3428	39988	3749	32
29	49890	2300	47686	2561	45601	2836	43624	3127	41746	3433	39959	3755	31
30	49852	2304	47650	2565	45567	2841	43592	3132	41716	3438	39930	3760	30
31	49815	2309	47615	2570	45534	2846	43560	3137	41685	3444	39901	3766	29
32	49777	2313	47579	2574	45500	2851	43528	3142	41655	3449	39872	3771	28
33	49739	2317	47544	2579	45466	2855	43496	3147	41625	3454	39843	3777	27
34	49702	2321	47508	2583	45433	2860	43464	3152	41594	3459	39814	3782	26
35	49664	2325	47472	2588	45399	2865	43432	3157	41564	3465	39785	3788	25
36	49626	2330	47437	2592	45365	2870	43400	3162	41533	3470	39756	3793	24
37	49589	2334	47402	2597	45332	3874	43369	3167	41503	3475	39727	3799	23
38	49551	2338	47366	2601	45298	2879	43337	3172	41473	3480	39698	3804	22
39	49514	2343	47331	2606	45265	2884	43305	3177	41443	3486	39669	3810	21
40	49477	2347	47295	2610	45231	2889	43273	3182	41412	3491	39641	3815	20
41	49439	2351	47260	2615	45198	2893	43241	3187	41382	3496	39612	3821	19
42	49402	2355	47225	2619	45164	2898	43210	3192	41352	3502	39583	3826	18
43	49365	2360	47189	2624	45131	2903	43178	3197	41322	3507	39554	3832	17
44	49327	2364	47154	2628	45097	2908	43146	3202	41291	3512	39525	3838	16
45	49290	2368	47119	2633	45064	2913	43114	3207	41261	3517	39497	3843	15
46	49253	2372	47084	2637	45031	2917	43083	3212	41231	3523	39468	3849	14
47	49216	2377	47049	2642	44997	2922	43051	3217	41201	3528	39439	3854	13
48	49179	2381	47014	2646	44964	2927	43020	3222	41171	3533	39411	3860	12
49	49141	2385	46978	2651	44931	2932	42988	3227	41141	3539	39382	3865	11
50	49104	2390	46943	2656	44898	2936	42956	3233	41111	3544	39353	3871	10
51	49067	2394	46908	2660	44864	2941	42925	3238	41081	3549	39325	3876	9
52	49030	2398	46873	2665	44831	2946	42893	3243	41051	3555	39296	3882	8
53	48993	2403	46839	2669	44798	2951	42862	3248	41021	3560	39268	3888	7
54	48957	2407	46804	2674	44765	2956	42830	3253	40991	3565	39239	3893	6
55	48920	2411	46769	2678	44732	2961	42799	3258	40961	3571	39211	3899	5
56	48883	2416	46734	2683	44699	2965	42768	3263	40931	3576	39182	3904	4
57	48846	2420	46699	2688	44666	2970	42736	3268	40902	3581	39154	3910	3
58	48809	2424	46664	2692	44633	2975	42705	3273	40872	3587	39125	3916	2
59	48772	2429	46630	2697	44600	2980	42674	3278	40842	3592	39097	3921	1
60	48736	3433	46595	2701	44567	2985	42642	3283	40812	3597	39069	3927	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	161°00′		160°00′		159°00′		158°00′		157°00′		156°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90° take, "K" from *bottom* of table

′	24°00′		25°00′		26°00′		27°00′		28°00′		29°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	39069	3927	37405	4272	35816	4634	34295	5012	32839	5406	31443	5818	60
1	39040	3932	37378	4278	35790	4640	34270	5018	32815	5413	31420	5825	59
2	39012	3938	37351	4284	35764	4646	34246	5025	32792	5420	31397	5832	58
3	38984	3944	37324	4290	35738	4651	34221	5031	32768	5426	31375	5839	57
4	38955	3949	37297	4296	35712	4659	34196	5038	32744	5433	31352	5846	56
5	38927	3955	37270	4302	35686	4665	34172	5044	32720	5440	31329	5853	55
6	38899	3961	37243	4308	35661	4671	34147	5051	32697	5447	31306	5860	54
7	38871	3966	37216	4314	35635	4677	34122	5057	32673	5454	31284	5867	53
8	38842	3972	37189	4320	35609	4683	34097	5064	32649	5460	31261	5874	52
9	38814	3978	37162	4326	35583	4690	34073	5070	32625	5467	31238	3881	51
10	38786	3983	37135	4332	35558	4696	34048	5076	32592	5474	31216	5888	50
11	38758	3989	37108	4337	35532	4702	34024	5083	32579	5481	31193	5895	49
12	38730	3995	37081	4343	35506	4708	33999	5089	32555	5487	31170	5902	48
13	38702	4000	37055	4349	35481	4714	33974	5096	32532	5494	31148	5909	47
14	38674	4006	37028	4355	35455	4721	33950	5102	32508	5501	31125	5917	46
15	38645	4012	37001	4361	35429	4727	33925	5109	32484	5508	31103	5924	45
16	38617	4017	36974	4367	35404	4733	33901	5115	32461	5515	31080	5931	44
17	38589	4023	36948	4373	35378	4739	33876	5122	32438	5521	31058	3938	43
18	38561	4029	36921	4379	35353	4746	33852	5128	32414	5528	31035	5945	42
19	38533	4035	36894	4385	35327	4752	33827	5135	32391	5535	31013	5952	41
20	38506	4040	36867	4391	35302	4758	33803	5142	32367	5542	30990	5959	40
21	38478	4046	36841	4397	35276	4764	33779	5148	32344	5549	30968	5966	39
22	38450	4052	36814	4403	35251	4771	33754	5155	32320	5555	30945	5973	38
23	38422	4057	36787	4409	35225	4777	33730	5161	32297	5562	30923	5980	37
24	38394	4063	36761	4415	35200	4783	33705	5168	32274	5569	30900	5988	36
25	38366	4069	36734	4421	35174	4789	33681	5174	32250	5576	30878	5995	35
26	38338	4075	36708	4427	35149	4796	33657	5181	32227	5583	30856	6002	34
27	38311	4080	36681	4433	35123	4802	33632	5187	32204	5590	30833	6009	33
28	38283	4086	36655	4439	35098	4808	33608	5194	32180	5596	30811	6016	32
29	38255	4092	36628	4445	35073	4815	33584	5200	32157	5603	30788	6023	31
30	38227	4098	36602	4451	35047	4821	33559	5207	32134	5610	30766	6030	30
31	38200	4103	36575	4457	35022	4827	33535	5214	32110	5617	30744	6038	29
32	38172	4109	36549	4463	34997	4833	33511	5220	32087	5624	30721	6045	28
33	38144	4115	36522	4469	34971	4840	33487	5227	32064	5631	30699	6052	27
34	38117	4121	36496	4475	34946	4846	33462	5233	32041	5638	30677	6059	26
35	38089	4127	36469	4481	34921	4852	33438	5240	32018	5645	30655	6066	25
36	38061	4132	36443	4487	34896	4859	33414	5247	31994	5651	30632	6073	24
37	38034	4138	36417	4493	34870	4865	33390	5253	31971	5658	30610	6080	23
38	38006	4144	36390	4499	34845	4871	33366	5260	31948	5665	30588	6088	22
39	37979	4150	36364	4506	34820	4878	33342	5266	31925	5672	30566	6095	21
40	37951	4155	36338	4512	34795	4884	33318	5273	31902	5679	30544	6102	20
41	37924	4161	36311	4518	34770	4890	33293	5280	31879	5686	30521	6109	19
42	37896	4167	36285	4524	34744	4897	33269	5287	31856	5693	30499	6116	18
43	37869	4173	36259	4530	34719	4903	33245	5293	31833	5700	30477	6124	17
44	37841	4179	36233	4536	34694	4910	33221	5300	31809	5707	30455	6131	16
45	37814	4185	36206	4542	34669	4916	33197	5306	31786	5714	30433	6138	15
46	37786	4190	36180	4548	34644	4922	33173	5313	31763	5720	30411	6145	14
47	37759	4196	36154	4554	34619	4929	33149	5320	31740	5727	30389	6153	13
48	37732	4202	36128	4560	34594	4935	33125	5326	31717	5734	30367	6160	12
49	37704	4208	36102	4566	34569	4941	33101	5333	31694	5741	30345	6167	11
50	37677	4214	36076	4573	34544	4948	33077	5340	31672	5748	30322	6174	10
51	37650	4220	36050	4579	34519	4954	33054	5346	31648	5755	30300	6181	9
52	37623	4225	36024	4585	34494	4961	33030	5353	31626	5762	30278	6189	8
53	37595	4231	35998	4591	34469	4967	33006	5360	31603	5769	30256	6196	7
54	37568	4237	35972	4597	34445	4973	32982	5366	31580	5776	30235	6203	6
55	37541	4243	35946	4603	34420	4980	32958	5373	31557	5783	30213	6210	5
56	37514	4249	35920	4609	34395	4986	32934	5380	31534	5790	30191	6218	4
57	37486	4255	35894	4615	34370	4993	32910	5386	31511	5797	30169	6225	3
58	37459	4261	35868	4622	34345	4999	32887	5393	31488	5804	30147	6232	2
59	37432	4266	35842	4628	34320	5005	32863	5400	31466	5811	30125	6240	1
60	37405	4272	35816	4634	34295	5012	32839	5406	31443	5818	30103	6247	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	155°00′		154°00′		153°00′		152°00′		151°00′		150°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	30°00′		31°00′		32°00′		33°00′		34°00′		35°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	30103	6247	28816	6693	27579	7158	26389	7641	25244	8143	24141	8663	60
1	30081	6254	28795	6701	27559	7166	26370	7649	25225	8151	24123	8672	59
2	30059	6262	28774	6709	27539	7174	26350	7657	25206	8160	24105	8681	58
3	30037	6269	28753	6716	27518	7182	26331	7665	25188	8168	24087	8690	57
4	30016	6276	28732	6724	27498	7190	26311	7674	25169	8177	24069	8699	56
5	29994	6284	28711	6731	27478	7197	26292	7682	25150	8185	24051	8708	55
6	29972	6291	28690	6739	27458	7205	26273	7690	25132	8194	24033	8717	54
7	29950	6298	28669	6747	27438	7213	26253	7698	25113	8202	24015	8726	53
8	29928	6305	28648	6754	27418	7221	26234	7707	25094	8211	23997	8734	52
9	29907	6313	28627	6762	27398	7229	26214	7715	25076	8219	23979	8743	51
10	29885	6320	28606	6770	27377	7237	26195	7723	25057	8228	23961	8752	50
11	29863	6328	28586	6777	27357	7245	26176	7731	25038	8237	23943	8761	49
12	29841	6335	28565	6785	27337	7253	26157	7740	25020	8245	23925	8770	48
13	29820	6342	28544	6791	27317	7261	26137	7748	25001	8254	23907	8779	47
14	29798	6350	28523	6800	27297	7269	26118	7756	24983	8262	23889	8788	46
15	29776	6357	28502	6808	27277	7277	26099	7764	24964	8271	23871	8797	45
16	29755	6364	28481	6815	27257	7285	26079	7773	24946	8280	23854	8806	44
17	29733	6372	28461	6823	27237	7293	26060	7781	24927	8288	23836	8815	43
18	29711	6379	28440	6831	27217	7301	26041	7789	24909	8297	23818	8824	42
19	29690	6386	28419	6839	27197	7309	26022	7798	24890	8305	23800	8833	41
20	29668	6394	28398	6846	27177	7317	26002	7806	24872	8314	23782	8842	40
21	29647	6401	28378	6854	27157	7325	25983	7814	24853	8323	23764	8850	39
22	29625	6409	28357	6862	27137	7333	25964	7823	24835	8331	23747	8859	38
23	29604	6416	28336	6869	27117	7341	25945	7831	24816	8340	23729	8868	37
24	29582	6423	82315	6877	27098	7349	25926	7839	24798	8349	23711	8877	36
25	29560	6431	28295	6885	27078	7357	25907	7848	24779	8357	23693	8886	35
26	29539	6438	28274	6893	27058	7365	25887	7856	24761	8366	23675	8895	34
27	29517	6446	28253	6900	27038	7373	25868	7864	24742	8375	23658	8904	33
28	29496	6453	28233	6908	27018	7381	25849	7873	24724	8383	23640	8913	32
29	29475	6461	28212	6916	26998	7389	25830	7881	24706	8392	23622	8922	31
30	29453	6468	28191	6923	26978	7397	25811	7889	24687	8401	23605	8931	30
31	29432	6475	28171	6931	26958	7405	25792	7898	24669	8409	23587	8940	29
32	29410	6483	28150	6939	26939	7413	25773	7906	24650	8418	23569	8949	28
33	29389	6490	28130	6947	26919	7421	25754	7914	24632	8427	23551	8958	27
34	29367	6498	28109	6954	26899	7429	25735	7923	24614	8435	23534	8967	26
35	29346	6505	28089	6962	26879	7437	25716	7931	24595	8444	23516	8976	25
36	29325	6513	28068	6970	26860	7445	25697	7940	24577	8453	23498	8986	24
37	29303	6520	28047	6978	26840	7453	25678	7948	24559	8461	23481	8995	23
38	29282	6528	28027	6985	26820	7462	25659	7956	24540	8470	23463	9004	22
39	29261	6535	28006	6993	26800	7470	25640	7965	24522	8479	23446	9013	21
40	29239	6543	27986	7001	26781	7478	25621	7973	24504	8488	23428	9022	20
41	29218	6550	27965	7009	26761	7486	25602	7982	24486	8496	23410	9031	19
42	29197	6558	27945	7017	26741	7494	25583	7990	24467	8505	23393	9040	18
43	29175	6565	27925	7024	26722	7502	25564	7998	24449	8514	23375	9049	17
44	29154	6573	27904	7032	26702	7510	25545	8007	24431	8523	23358	9058	16
45	29133	6580	27884	7040	26682	7518	25526	8015	24413	8531	23340	9067	15
46	29112	6588	27863	7048	26663	7526	25507	8024	24395	8540	23323	9076	14
47	29091	6595	27843	7056	26643	7535	25488	8032	24376	8549	23305	9085	13
48	29069	6603	27823	7064	26623	7543	25469	8041	24358	8558	23288	9094	12
49	29048	6610	27802	7071	26604	7551	25451	8049	24340	8567	23270	9104	11
50	29027	6618	27782	7079	26584	7559	25432	8058	24322	8575	23252	9113	10
51	29006	6625	27761	7087	26565	7567	25413	8066	24304	8584	23235	9122	9
52	28985	6633	27741	7095	26545	7575	25394	8075	24286	8593	23218	9131	8
53	28964	6640	27721	7103	26526	7584	25375	8083	24267	8602	23200	9140	7
54	28942	6648	27701	7111	26506	7592	25356	8091	24249	8611	23183	9149	6
55	28921	6655	27680	7118	26486	7600	25338	8100	24231	8619	23165	9158	5
56	28900	6663	27660	7126	26467	7608	25319	8108	24213	8628	23148	9168	4
57	28879	6671	27640	7134	26447	7616	25300	8117	24195	8637	23130	9177	3
58	28858	6678	27619	7142	26428	7625	25281	8125	24177	8646	23113	9186	2
59	28837	6686	27599	7150	26409	7633	25263	8134	24159	8655	23095	9195	1
60	28816	6693	27579	7158	26389	7641	25244	8143	24141	8663	23078	9204	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	149°00′		148°00′		147°00′		146°00′		145°00′		144°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	36°00′		37°00′		38°00′		39°00′		40°00′		41°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	23078	9204	22054	9765	21066	10347	20113	10950	19193	11575	18306	12222	60
1	23061	9213	22037	9775	21050	10357	20097	10960	19178	11585	18291	12233	59
2	23043	9223	22020	9784	21033	10367	20082	10970	19163	11596	18277	12244	58
3	23026	9232	22003	9794	21017	10376	20066	10980	19148	11606	18262	12255	57
4	23009	9241	21987	9803	21001	10386	20050	10991	19133	11617	18248	12266	56
5	22991	9250	21970	9813	20985	10396	20035	11001	19118	11628	18233	12277	55
6	22974	9259	21953	9822	20969	10406	20019	11011	19103	11638	18219	12288	54
7	22957	9269	21937	9832	20953	10416	20004	11021	19088	11649	18204	12299	53
8	22939	9278	21920	9843	20937	10426	19988	11032	19073	11660	18190	12310	52
9	22922	9287	21903	9851	20921	10436	19973	11042	19058	11670	18175	12321	51
10	22905	9296	21887	9861	20905	10446	19957	11052	19043	11681	18161	12332	50
11	22887	9305	21870	9870	20888	10456	19942	11063	19028	11692	18146	12343	49
12	22870	9315	21853	9880	20872	10466	19926	11073	19013	11702	18132	12354	48
13	22853	9324	21837	9889	20856	10476	19911	11083	18998	11713	18117	12365	47
14	22836	9333	21820	9899	20840	10486	19895	11094	18983	11724	18103	12376	46
15	22818	9342	21803	9909	20824	10496	19880	11104	18968	11734	18089	12387	45
16	22801	9352	21787	9918	20808	10505	19864	11114	18953	11745	18074	12398	44
17	22784	9361	21770	9928	20792	10515	19849	11124	18939	11756	18060	12410	43
18	22767	9370	21754	9937	20776	10525	19834	11135	18924	11766	18045	12421	42
19	22750	9380	21737	9947	20760	10535	19818	11145	18909	11777	18031	12432	41
20	22732	9389	21720	9957	20744	10545	19803	11156	18894	11788	18017	12443	40
21	22715	9398	21704	9966	20728	10555	19787	11166	18879	11799	18002	12454	39
22	22698	9407	21687	9976	20712	10565	19772	11176	18864	11809	17988	12465	38
23	22681	9417	21671	9986	20696	10575	19756	11187	18849	11820	17974	12476	37
24	22664	9426	21654	9995	20680	10585	19741	11197	18834	11831	17959	12487	36
25	22647	9435	21638	10005	20665	10595	19726	11207	18820	11842	17945	12499	35
26	22630	9445	21621	10015	20649	10605	19710	11218	18805	11852	17931	12510	34
27	22612	9454	21605	10024	20633	10615	19695	11228	18790	11863	17916	12521	33
28	22595	9463	21588	10034	20617	10625	19680	11239	18775	11874	17902	12532	32
29	22578	9473	21572	10044	20601	10635	19664	11249	18760	11885	17888	12543	31
30	22561	9482	21555	10053	20585	10646	19649	11259	18746	11895	17873	12554	30
31	22544	9492	21539	10063	20569	10656	19634	11270	18731	11906	17859	12566	29
32	22527	9501	21522	10073	20553	10666	19618	11280	18716	11917	17845	12577	28
33	22510	9510	21506	10082	20537	10676	19603	11291	18701	11928	17831	12588	27
34	22493	9520	21489	10092	20522	10686	19588	11301	18686	11939	17816	12599	26
35	22476	9529	21473	10102	20506	10696	19572	11311	18672	11949	17802	12610	25
36	22459	9538	21457	10112	20490	10706	19557	11322	18657	11960	17788	12622	24
37	22442	9548	21440	10121	20474	10716	19541	11332	18642	11971	17774	12633	23
38	22425	9557	21424	10131	20458	10726	19527	11343	18627	11982	17760	12644	22
39	22408	9566	21407	10141	20442	10736	19511	11353	18613	11993	17745	12655	21
40	22391	9576	21391	10151	20427	10746	19496	11364	18598	12004	17731	12667	20
41	22374	9585	21375	10160	20411	10756	19481	11374	18583	12014	17717	12678	19
42	22357	9595	21358	10170	20395	10767	19466	11385	18569	12025	17703	12689	18
43	22340	9604	21342	10180	20379	10777	19450	11395	18554	12036	17689	12700	17
44	22323	9614	21326	10190	20364	10787	19435	11406	18539	12047	17674	12711	16
45	22306	9623	21309	10199	20348	10797	19420	11416	18525	12058	17660	12723	15
46	22289	9632	21293	10209	20332	10807	19405	11427	18510	12069	17646	12734	14
47	22272	9642	21277	10219	20316	10817	19390	11437	18495	12080	17632	12745	13
48	22256	9651	21260	10229	20301	10827	19375	11448	18481	12091	17618	12757	12
49	22239	9661	21244	10239	20285	10838	19359	11458	18466	12102	17604	12768	11
50	22222	9670	21228	10248	20269	10848	19344	11469	18451	12112	17590	12779	10
51	22205	9680	21212	10258	20254	10858	19329	11479	18437	12123	17575	12790	9
52	22188	9689	21195	10268	20238	10868	19314	11490	18422	12134	17561	12802	8
53	22171	9699	21179	10278	20222	10878	19299	11501	18408	12145	17547	12813	7
54	22154	9708	21163	10288	20207	10888	19284	11511	18393	12156	17533	12824	6
55	22138	9718	21147	10298	20191	10899	19269	11522	18378	12167	17519	12836	5
56	22121	9727	21131	10307	20175	10909	19253	11532	18364	12178	17505	12847	4
57	22104	9737	21114	10317	20160	10919	19238	11543	18349	12189	17491	12859	3
58	22087	9746	21098	10327	20144	10929	19223	11553	18335	12200	17477	12870	2
59	22070	9756	21082	10337	20128	10939	19208	11564	18320	12211	17463	12881	1
60	22054	9765	21066	10347	20113	10950	19193	11575	18306	12222	17449	12893	0
	A	B	A	B	A	B	A	B	A	B	A	B	
′	143°00′		142°00′		141°00′		140°00′		139°00′		138°00′		′

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	42°00′		43°00′		44°00′		45°00′		46°00′		47°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	17449	12893	16622	13587	15823	14307	15051	15051	14307	15823	13587	16622	60
1	17435	12904	16608	13599	15810	14319	15039	15064	14294	15836	13575	16635	59
2	17421	12915	16595	13611	15797	14331	15026	15077	14282	15849	13564	16649	58
3	17407	12927	16581	13623	15784	14343	15014	15089	14270	15862	13552	16662	57
4	17393	12938	16567	13634	15771	14355	15001	15102	14258	15875	13540	16676	56
5	17379	12950	16554	13646	15758	14368	14988	15115	14246	15888	13528	16689	55
6	17365	12961	16540	13658	15744	14380	14976	15127	14233	15901	13517	16703	54
7	17351	12972	16527	13670	15731	14392	14963	15140	14221	15915	13505	16717	53
8	17337	12984	16513	13682	15718	14404	14951	15153	14209	15928	13493	16730	52
9	17323	12995	16500	13694	15705	14417	14938	15165	14197	15941	13481	16744	51
10	17309	13007	16487	13705	15692	14429	14925	15178	14185	15954	13470	16757	50
11	17295	13018	16473	13717	15679	14441	14913	15191	14173	15967	13458	16771	49
12	17281	13030	16460	13729	15666	14453	14900	15204	14161	15980	13446	16785	48
13	17267	13041	16446	13741	15653	14466	14888	15216	14149	15994	13435	16798	47
14	17253	13053	16433	13753	15640	14478	14875	15229	14136	16007	13423	16812	46
15	17239	13064	16419	13765	15627	14490	14863	15242	14124	16020	13411	16826	45
16	17225	13075	16406	13777	15614	14503	14850	15255	14112	16033	13400	16839	44
17	17212	13087	16392	13789	15602	14515	14838	15267	14100	16046	13388	16853	43
18	17198	13098	16379	13800	15589	14527	14825	15280	14088	16060	13376	16867	42
19	17184	13110	16366	13812	15576	14540	14813	15293	14076	16073	13365	16880	41
20	17170	13121	16352	13824	15563	14552	14800	15306	14064	16086	13353	16894	40
21	17156	13133	16339	13836	15550	14564	14788	15318	14052	16099	13341	16908	39
22	17142	13144	16325	13848	15537	14577	14775	15331	14040	16112	13330	16922	38
23	17128	13156	16312	13860	15524	14589	14763	15344	14028	16126	13318	16935	37
24	17114	13168	16299	13872	15511	14601	14750	15357	14016	16139	13306	16949	36
25	17101	13179	16285	13884	15498	14614	14738	15370	14004	16152	13295	16963	35
26	17087	13191	16272	13896	15485	14626	14725	15382	13992	16166	13283	16977	34
27	17073	13202	16259	13908	15472	14639	14713	15395	13980	16179	13272	16990	33
28	17059	13214	16245	13920	15459	14651	14701	15408	13968	16192	13260	17004	32
29	17046	13225	16232	13932	15447	14663	14688	15421	13956	16205	13248	17018	31
30	17032	13237	16219	13944	15434	14676	14676	15434	13944	16219	13237	17032	30
31	17018	13248	16205	13956	15421	14688	14663	15447	13932	16232	13225	17045	29
32	17004	13260	16192	13968	15408	14701	14651	15459	13920	16245	13214	17059	28
33	16990	13272	16179	13980	15395	14713	14639	15472	13908	16259	13202	17073	27
34	16977	13283	16166	13992	15382	14726	14626	15485	13896	16272	13191	17087	26
35	16963	13295	16152	14004	15370	14738	14614	15498	13884	16285	13179	17101	25
36	16949	13306	16139	14016	15357	14750	14601	15511	13872	16299	13168	17114	24
37	16935	13318	16126	14028	15344	14763	14589	15524	13860	16312	13156	17128	23
38	16922	13330	16112	14040	15331	14775	14577	15537	13848	16325	13144	17142	22
39	16908	13341	16099	14052	15318	14788	14564	15550	13836	16339	13133	17156	21
40	16894	13353	16086	14064	15306	14800	14552	15563	13824	16352	13121	17170	20
41	16880	13365	16073	14076	15293	14813	14540	15576	13812	16366	13110	17184	19
42	16867	13376	16060	14088	15280	14825	14527	15589	13800	16379	13098	17198	18
43	16853	13388	16046	14100	15267	14838	14515	15602	13788	16392	13087	17212	17
44	16839	13400	16033	14112	15255	14850	14503	15614	13777	16406	13075	17225	16
45	16826	13411	16020	14124	15242	14863	14490	15627	13765	16419	13064	17239	15
46	16812	13423	16007	14136	15229	14875	14478	15640	13753	16433	13053	17253	14
47	16798	13435	15994	14149	15216	14888	14466	15653	13741	16446	13041	17267	13
48	16785	13446	15980	14161	15204	14900	14453	15666	13729	16460	13030	17281	12
49	16771	13458	15967	14173	15191	14913	14441	15679	13717	16473	13018	17295	11
50	16757	13470	15954	14185	15178	14925	14429	15692	13705	16487	13007	17309	10
51	16744	13481	15941	14997	15165	14938	14417	15705	13694	16500	12995	17323	9
52	16730	13493	15928	14209	15153	14951	14404	15718	13682	16513	12984	17337	8
53	16717	13505	15915	14221	15140	14963	14392	15731	13670	16527	12972	17351	7
54	16703	13517	15901	14233	15127	14976	14380	15744	13658	16540	12961	17365	6
55	16689	13528	15888	14246	15115	14988	14368	15758	13646	16554	12950	17379	5
56	16676	13540	15875	14258	15102	15001	14355	15771	13634	16567	12938	17393	4
57	16662	13552	15862	14270	15089	15014	14343	15784	13623	16581	12927	17407	3
58	16649	13564	15849	14282	15077	15026	14331	15797	13611	16595	12915	17421	2
59	16635	13575	15836	14294	15064	15039	14319	15810	13599	16608	12904	17435	1
60	16622	13587	15823	14307	15051	15051	14307	15823	13587	16622	12893	17449	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	137°00′		136°00′		135°00′		134°00′		133°00′		132°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	48°00′		49°00′		50°00′		51°00′		52°00′		53°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	12893	17449	12222	18306	11575	19193	10950	20113	10347	21066	9765	22054	60
1	12881	17463	12211	18320	11564	19208	10939	20128	10337	21082	9756	22070	59
2	12870	17477	12200	18335	11553	19223	10929	20144	10327	21098	9746	22087	58
3	12859	17491	12189	18349	11543	19238	10919	20160	10317	21114	9737	22104	57
4	12847	17505	12178	18364	11532	19253	10909	20175	10307	21131	9727	22121	56
5	12836	17519	12167	18378	11522	19269	10899	20191	10298	21147	9718	22138	55
6	12824	17533	12156	18393	11511	19284	10888	20207	10288	21163	9708	22154	54
7	12813	17547	12145	18408	11501	19299	10878	20222	10278	21179	9699	22171	53
8	12802	17561	12134	18422	11490	19314	10868	20238	10268	21195	9689	22188	52
9	12790	17576	12123	18437	11479	19329	10858	20254	10258	21212	9680	22205	51
10	12779	17590	12112	18451	11469	19344	10848	20269	10248	21228	9670	22222	50
11	12768	17604	12102	18466	11458	19359	10838	20285	10239	21244	9661	22239	49
12	12757	17618	12091	18481	11448	19375	10827	20301	10229	21260	9651	22256	48
13	12745	17632	12080	18495	11437	19390	10817	20316	10219	21277	9642	22272	47
14	12734	17646	12069	18510	11427	19405	10807	20332	10209	21293	9632	22289	46
15	12723	17660	12058	18525	11416	19420	10797	20348	10199	21309	9623	22306	45
16	12711	17674	12047	18539	11406	19435	10787	20364	10190	21326	9614	22323	44
17	12700	17689	12036	18554	11395	19450	10777	20379	10180	21342	9604	22340	43
18	12689	17703	12025	18569	11385	19466	10767	20395	10170	21358	9595	22357	42
19	12678	17717	12014	18583	11374	19481	10756	20411	10160	21375	9585	22374	41
20	12666	17731	12004	18598	11364	19496	10746	20427	10151	21391	9576	22391	40
21	12655	17745	11993	18613	11353	19511	10736	20442	10141	21407	9566	22408	39
22	12644	17760	11982	18627	11343	19527	10726	20458	10131	21424	9557	22425	38
23	12633	17774	11971	18642	11332	19542	10716	20474	10121	21440	9548	22442	37
24	12622	17788	11960	18657	11322	19557	10706	20490	10112	21457	9538	22459	36
25	12610	17802	11949	18672	11311	19572	10696	20506	10102	21473	9529	22476	35
26	12599	17816	11939	18686	11301	19588	10686	20522	10092	21489	9520	22493	34
27	12588	17831	11928	18701	11291	19603	10676	20537	10082	21506	9510	22510	33
28	12577	17845	11917	18716	11280	19618	10666	20553	10073	21522	9501	22527	32
29	12566	17859	11906	18731	11270	19634	10656	20569	10063	21539	9491	22544	31
30	12554	17873	11895	18746	11259	19649	10646	20585	10053	21555	9482	22561	30
31	12543	17888	11885	18760	11249	19664	10635	20601	10044	21572	9473	22578	29
32	12532	17902	11874	18775	11239	19680	10625	20617	10034	21588	9463	22595	28
33	12521	17916	11863	18790	11228	19695	10615	20633	10024	21605	9454	22612	27
34	12510	17931	11852	18805	11218	19710	10605	20649	10015	21621	9445	22630	26
35	12499	17945	11842	18820	11207	19726	10595	20665	10005	21638	9435	22647	25
36	12487	17959	11831	18834	11197	19741	10585	20680	9995	21654	9426	22664	24
37	12476	17974	11820	18849	11187	19756	10575	20696	9986	21671	9417	22681	23
38	12465	17988	11809	18864	11176	19772	10565	20712	9976	21687	9407	22698	22
39	12454	18002	11799	18879	11166	19787	10555	20728	9966	21704	9398	22715	21
40	12443	18017	11788	18894	11156	19803	10545	20744	9957	21720	9389	22732	20
41	12432	18031	11777	18909	11145	19818	10535	20760	9947	21737	9380	22750	19
42	12421	18045	11766	18924	11135	19834	10525	20776	9937	21754	9370	22767	18
43	12410	18060	11756	18939	11124	19849	10515	20792	9928	21770	9361	22784	17
44	12398	18074	11745	18953	11114	19864	10505	20808	9918	21787	9352	22801	16
45	12387	18089	11734	18968	11104	19880	10496	20824	9909	21803	9342	22818	15
46	12376	18103	11724	18983	11094	19895	10486	20840	9899	21820	9333	22836	14
47	12365	18117	11713	18998	11083	19911	10476	20856	9889	21837	9324	22853	13
48	12354	18132	11702	19013	11073	19926	10466	20872	9880	21853	9315	22870	12
49	12343	18146	11692	19028	11063	19942	10456	20888	9870	21870	9305	22887	11
50	12332	18161	11681	19043	11052	19957	10446	20905	9861	21887	9296	22905	10
51	12321	18175	11670	19058	11042	19973	10436	20921	9851	21903	9287	22922	9
52	12310	18190	11660	19073	11032	19988	10426	20937	9841	21920	9278	22939	8
53	12299	18204	11649	19088	11021	20004	10416	20953	9832	21937	9269	22957	7
54	12288	18219	11638	19103	11011	20019	10406	20969	9822	21953	9259	22974	6
55	12277	18233	11628	19118	11001	20035	10396	20985	9813	21970	9250	22991	5
56	12266	18248	11617	19133	10991	20050	10386	21001	9803	21987	9241	23009	4
57	12255	18262	11606	19148	10980	20066	10376	21017	9794	22003	9232	23026	3
58	12244	18277	11596	19163	10970	20082	10367	21033	9784	22020	9223	23043	2
59	12233	18291	11585	19178	10960	20097	10357	21050	9775	22037	9213	23061	1
60	12222	18306	11575	19193	10950	20113	10347	21066	9765	22054	9204	23078	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	131°00′		130°00′		129°00′		128°00′		127°00′		126°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	54°00′		55°00′		56°00′		57°00′		58°00′		59°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	9204	23078	8663	24141	8143	25244	7641	26389	7158	27579	6693	28816	60
1	9195	23095	8655	24159	8134	25263	7633	26409	7150	27599	6686	28837	59
2	9186	23113	9646	24177	8125	25281	7624	26428	7142	27619	6678	28858	58
3	9177	23130	8637	24195	8117	25300	7616	26447	7134	27640	6671	28879	57
4	9168	23148	8628	24213	8108	25319	7608	26467	7126	27660	6663	28900	56
5	9158	23165	8619	24231	8100	25338	7600	26486	7118	27680	6655	28921	55
6	9149	23183	8611	24249	8092	25356	7592	26506	7111	27701	6648	28942	54
7	9140	23200	8602	24267	8083	25375	7584	26526	7103	27721	6640	28964	53
8	9131	23218	8593	24286	8075	25394	7575	26545	7095	27741	6633	28985	52
9	9122	23235	8584	24304	8066	25413	7567	26565	7087	27761	6625	29006	51
10	9113	23252	8575	24322	8058	25432	7559	26584	7079	27782	6618	29027	50
11	9104	23270	8567	24340	8049	25451	7551	26604	7071	27802	6610	29048	49
12	9094	23288	8558	24358	8041	25469	7543	26623	7064	27823	6603	29069	48
13	9085	23305	8549	24376	8032	25488	7535	26643	7056	27843	6595	29091	47
14	9076	23323	8540	24395	8024	25507	7526	26663	7048	27863	6588	29112	46
15	9067	23340	8531	24413	8015	25526	7518	26682	7040	27884	6580	29133	45
16	9058	23358	8523	24431	8007	25545	7510	26702	7032	27904	6573	29154	44
17	9049	23375	8514	24449	7998	25564	7502	26722	7024	27925	6565	29175	43
18	9040	23393	8505	24467	7990	25583	7494	26741	7017	27945	6558	29197	42
19	9031	23410	8496	24486	7982	25602	7486	26761	7009	27965	6550	29218	41
20	9022	23428	8488	24504	7973	25621	7478	26781	7001	27986	6543	29239	40
21	9013	23446	8479	24522	7965	25640	7470	26800	6993	28006	6535	29261	39
22	9004	23463	8470	24540	7956	25659	7462	26820	6985	28027	6528	29282	38
23	8995	23481	8461	24559	7948	25678	7453	26840	6978	28047	6520	29303	37
24	8985	23498	8453	24577	7940	25697	7445	26860	6970	28068	6513	29325	36
25	8976	23516	8444	24595	7931	25716	7437	36879	6962	28089	6505	29346	35
26	8967	23534	8435	24614	7923	25735	7429	26899	6954	28109	6498	29367	34
27	8958	23551	8427	24632	7914	25754	7421	26919	6947	28130	6490	29389	33
28	8949	23569	8418	24650	7906	25773	7413	26939	6939	28150	6483	29410	32
29	8940	23587	8409	24669	7898	25792	7405	26958	6931	28171	6475	29432	31
30	8931	23605	8401	24687	7889	25811	7397	26978	6923	28191	6468	29453	30
31	8922	23622	8392	24706	7881	25830	7389	26998	6916	28212	6460	29475	29
32	8913	23640	8383	24724	7873	25849	7381	27018	6908	28233	6453	29496	28
33	8904	23658	8375	24742	7864	25868	7373	27038	6900	28253	6446	29517	27
34	8895	23675	8366	24761	7856	25887	7365	27058	6892	28274	6438	29539	26
35	8886	23693	8357	24779	7848	25907	7357	27078	6885	28295	6431	29560	25
36	8877	23711	8349	24798	7839	25926	7349	27098	6877	28315	6423	29582	24
37	8868	23729	8240	24816	7831	25945	7341	27117	6869	28336	6416	29604	23
38	8859	23747	8331	24835	7823	25964	7333	27137	6862	28357	6409	29625	22
39	8850	23764	8323	24853	7814	25983	7325	27157	6854	28378	6401	29647	21
40	8842	23782	8314	24872	7806	26002	7317	27177	6846	28398	6394	29668	20
41	8833	23800	8305	24890	7798	26022	7309	27197	6839	28419	6386	29690	19
42	8824	23818	8297	24909	7789	26041	7301	27217	6831	28440	6379	29711	18
43	8815	23836	8288	24927	7781	26060	7293	27237	6823	28461	6372	29733	17
44	8806	23854	8280	24946	7773	26079	7285	27257	6815	28481	6364	29755	16
45	8797	23871	8271	24964	7764	26099	7277	27277	6808	28502	6357	29776	15
46	8788	23889	8262	24983	7756	26118	7269	27297	6800	28523	6349	29798	14
47	8779	23907	8254	25001	7748	26137	7261	27317	6792	28544	6342	29820	13
48	8770	23925	8245	25020	7740	26157	7253	27337	6785	28565	6335	29841	12
49	8761	23943	8237	25038	7731	26176	7245	27357	6777	28586	6327	29863	11
50	8752	23961	8228	25057	7723	26195	7237	27377	6770	28607	6320	29885	10
51	8743	23979	8219	25076	7715	26214	7229	27398	6762	28627	6313	29907	9
52	8734	23997	8211	25094	7707	26234	7221	27418	6754	28648	6305	29929	8
53	8726	24015	8202	25113	7698	26253	7213	27438	6747	28669	6298	29950	7
54	8717	24033	8194	25132	7690	26273	7205	27458	6739	28690	6291	29972	6
55	8708	24051	8185	25150	7682	26292	7197	27478	6731	28711	6283	29994	5
56	8699	24069	8177	25169	7674	26311	7190	27498	6724	28732	6276	30015	4
57	8690	24087	8168	25188	7665	26331	7182	27518	6716	28753	6269	30037	3
58	8681	24105	8160	25206	7657	26350	7174	27539	6709	28774	6261	30059	2
59	8672	24123	8151	25225	7649	26370	7166	27559	6701	28795	6254	30081	1
60	8663	24141	8143	25244	7641	26389	7158	27579	6693	28816	6247	30103	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	125°00′		124°00′		123°00′		122°00′		121°00′		120°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	60°00′		61°00′		62°00′		63°00′		64°00′		65°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	6247	30103	5818	31443	5406	32839	5012	34295	4634	35816	4272	37405	60
1	6240	30125	5811	31466	5400	32863	5005	34320	4628	35842	4266	37432	59
2	6232	30147	5804	31488	5393	32887	4999	34345	4622	35868	4261	37459	58
3	6225	30169	5797	31511	5386	32910	4993	34370	4615	35894	4255	37487	57
4	6218	30191	5790	31534	5380	32934	4986	34395	4609	35920	4249	37514	56
5	6210	30213	5783	31557	5373	32958	4980	34420	4603	35946	4243	37541	55
6	6203	30235	5776	31680	5366	32982	4973	34444	4597	35972	4237	37568	54
7	6196	30256	5769	31603	5360	33006	4967	34469	4591	35998	4231	27595	53
8	6189	30278	5762	31626	5353	33030	4961	34494	4585	36024	4225	37623	52
9	6181	30300	5755	31649	5346	33054	4954	34519	4579	36050	4220	37650	51
10	6174	30322	5748	31672	5340	33077	4948	34544	4573	36076	4214	37677	50
11	6167	30345	5741	31694	5333	33101	4941	34569	4566	36102	4208	37704	49
12	6160	30367	5734	31717	5326	33125	4935	34594	4560	36128	4202	37732	48
13	6152	30389	5727	31740	5320	33149	4929	34619	4554	36154	4196	37759	47
14	6145	30411	5720	31763	5313	33173	4922	34644	4548	36180	4190	37786	46
15	6138	30433	5714	31786	5306	33197	4916	34669	4542	36206	4185	37814	45
16	6131	30455	5707	31809	5300	33221	4910	34694	4536	36233	4179	37841	44
17	6124	30477	5700	31833	5293	33245	4903	34719	4530	36259	4173	37869	43
18	6116	30499	5693	31856	5286	33269	4897	34744	4524	36285	4167	37896	42
19	6109	30521	5686	31879	5280	33293	4890	34770	4518	36311	4161	37924	41
20	6102	30544	5679	31902	5273	33318	4884	34795	4512	36338	4155	37951	40
21	6095	30566	5672	31925	5266	33342	4878	34820	4506	36364	4150	37979	39
22	6088	30588	5665	31948	5260	33366	4871	34845	4500	36390	4144	38006	38
23	6080	30610	5658	31971	5253	33390	4865	34870	4493	39417	4138	38034	37
24	6073	30632	5651	31994	5247	33414	4859	34896	4487	36443	4132	38061	36
25	6066	30655	5644	32018	5240	33438	4852	34921	4481	36469	4127	38089	35
26	6059	30677	5638	32041	5233	33462	4846	34946	4475	36496	4121	38117	34
27	6052	30699	5631	32064	5227	33487	4840	34971	4469	36522	4115	38144	33
28	6045	30721	5624	32087	5220	33511	4833	34997	4463	36549	4109	38172	32
29	6037	30744	5617	32110	5214	33535	4827	35022	4457	36575	4103	38200	31
30	6030	30766	5610	32134	5207	33559	4821	35047	4451	36602	4098	38227	30
31	6023	30788	5603	32157	5200	33584	4815	35073	4445	36628	4092	38255	29
32	6016	30811	5596	32180	5194	33608	4808	35098	4439	36655	4086	38283	28
33	6009	30833	5590	32204	5187	33632	4802	35123	4433	36681	4080	38311	27
34	6002	30856	5583	32227	5181	33657	4796	35149	4427	36708	4075	38338	26
35	5995	30878	5575	32250	5174	33681	4789	35174	4421	36734	4069	38366	25
36	5987	30900	5569	32274	5168	33705	4783	35200	4415	36761	4063	38394	24
37	5980	30923	5562	32297	5161	33730	4777	35225	4409	36787	4057	38422	23
38	5973	30945	5555	32320	5155	33754	4771	35251	4403	36814	4052	38450	22
39	5966	30968	5549	32344	5148	33779	4764	35276	4397	36841	4046	38478	21
40	5959	30990	5542	32367	5142	33803	4758	35302	4391	36867	4040	38506	20
41	5952	31013	5535	32391	5135	33827	4752	35327	4385	36894	4035	38533	19
42	5945	31035	5528	32414	5128	33852	4746	35353	4379	36921	4029	38561	18
43	5938	31058	5521	32438	5122	33876	4739	35378	4373	36948	4023	38589	17
44	5931	31080	5515	32461	5115	39901	4733	35404	4367	36974	4017	38617	16
45	5924	31103	5508	32484	5109	33925	4727	35429	4361	37001	4012	38645	15
46	5917	31125	5501	32508	5102	33950	4721	35455	4355	37028	4006	38674	14
47	5909	31148	5494	32532	5096	33974	4714	35481	4349	37055	4000	38702	13
48	5902	31170	5487	32555	5089	33999	4708	35506	4343	37081	3995	38730	12
49	5895	31193	5481	32579	5083	34024	4702	35532	4337	37108	3989	38758	11
50	5888	31216	5474	32602	5076	34048	4696	35558	4332	37135	3983	38786	10
51	5881	31238	5467	32625	5070	34073	4690	35583	4326	37162	3978	38814	9
52	5874	31261	5460	32649	5064	34097	4683	35609	4320	37189	3972	38842	8
53	5867	31284	5454	32673	5057	34122	4677	35635	4314	37216	3966	38871	7
54	5860	31306	5447	32697	5051	34147	4671	35661	4308	37243	3961	38899	6
55	5853	31329	5440	32720	5044	34172	4665	35686	4302	37270	3955	38927	5
56	5846	31352	5433	32744	5038	34196	4659	35712	4296	37297	3949	38955	4
57	5839	31375	5427	32768	5031	34221	4652	35738	4290	37324	3944	38984	3
58	5832	31397	5420	32792	5025	34246	4646	35764	4284	37351	3938	39012	2
59	5825	31420	5413	32815	5018	34270	4640	35790	4278	37378	3933	39040	1
60	5818	31443	5406	32839	5012	34295	4634	35816	4272	37405	3927	39069	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	119°00′		118°00′		117°00′		116°00′		115°00′		114°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	66°00′		67°00′		68°00′		69°00′		70°00′		71°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	3927	39069	3597	40812	3283	42642	2985	44567	2701	46595	2433	48736	60
1	3921	39097	3592	40842	3278	42674	2980	44600	2697	46630	2429	48772	59
2	3916	39125	3587	40872	3273	42705	2975	44633	2692	46664	2424	48809	58
3	3910	39154	3581	40902	3268	42736	2970	44666	2688	46699	2420	48846	57
4	3904	39182	3576	40931	3263	42768	2965	44699	2683	46734	2416	48883	56
5	3899	39211	3571	40961	3258	42799	2961	44732	2678	46769	2411	48920	55
6	3893	39239	3565	40991	3253	42830	2956	44765	2674	46804	2407	48957	54
7	3888	39268	3560	41021	3248	42862	2951	44798	2669	46839	2403	48993	53
8	3882	39296	3555	41051	3243	42893	2946	44831	2665	46873	2398	49030	52
9	3876	39325	3549	41081	3237	42925	2941	44864	2660	46908	2394	49067	51
10	3871	39353	3544	41111	3233	42956	2936	44898	2656	46943	2390	49104	50
11	3865	39382	3539	41141	3227	42988	2932	44931	2651	46978	2385	49141	49
12	3860	39411	3533	41171	3222	43020	2927	44964	2646	47014	2381	49179	48
13	3854	39439	3528	41201	3217	43051	2922	44997	2642	47049	2377	49216	47
14	3849	39468	3523	41231	3212	43083	2917	45031	2637	47084	2372	49253	46
15	3843	39497	3517	41261	3207	43114	2913	45064	2633	47119	2368	49290	45
16	3838	39525	3512	41291	3202	43146	2908	45097	2628	47154	2364	49327	44
17	3832	39554	3507	41322	3197	43178	2903	45131	2624	47189	2360	49365	43
18	3826	39583	3502	41352	3192	43210	2898	45164	2619	47225	2355	49402	42
19	3821	39612	3496	41382	3187	43241	2893	45198	2615	47260	2351	49439	41
20	3815	39641	3491	41412	3182	43273	2889	45231	2610	47295	2347	49477	40
21	3810	39669	3486	41443	3177	43305	2884	45265	2606	47331	2343	49514	39
22	3804	39698	3480	41473	3172	43337	2879	45298	2601	47366	2338	49551	38
23	3799	39727	3475	41503	3167	43369	2874	45332	2597	47402	2334	49589	37
24	3793	39756	3470	41533	3162	43400	2870	45365	2592	47437	2330	49626	36
25	3788	39785	3465	41564	3157	43432	2865	45399	2588	47472	2325	49664	35
26	3782	39814	3459	41594	3152	43464	2860	45433	2583	47508	2321	49702	34
27	3777	39843	3454	41625	3147	43496	2855	45466	2579	47544	2317	49739	33
28	3771	39872	3449	41655	3142	43528	2851	45500	2574	47579	2313	49777	32
29	3766	39901	3444	41685	3137	43560	2846	45534	2570	47615	2309	49815	31
30	3760	39930	3438	41716	3132	43592	2841	45567	2565	47650	2304	49852	30
31	3755	39959	3433	41746	3127	43624	2836	45601	2561	47686	2300	49890	29
32	3749	39988	3428	41777	3122	43657	2832	45635	2556	47722	2296	49928	28
33	3744	40017	3423	41808	3117	43689	2827	45669	2552	47758	2292	49966	27
34	3738	40046	3418	41838	3112	43721	2822	45703	2547	47793	2287	50004	26
35	3733	40076	3412	41869	3107	43753	2818	45737	2543	47829	2283	50042	25
36	3727	40105	3407	41899	3102	43785	2813	45771	2539	47865	2279	50080	24
37	3722	40134	3402	41930	3097	43818	2808	45805	2534	47901	2275	50117	23
38	3716	40163	3397	41961	3092	43850	2804	45839	2530	47937	2271	50156	22
39	3711	40192	3391	41991	3088	43882	2799	45873	2525	47973	2266	50194	21
40	3705	40222	3386	42022	3083	43914	2794	45907	2521	48009	2262	50232	20
41	3700	40251	3381	42053	3078	43947	2789	45941	2516	48045	2258	50270	19
42	3695	40280	3376	42084	3073	43979	2785	45975	2512	48081	2254	50308	18
43	3689	40310	3371	42115	3068	44012	2780	46009	2507	48117	2250	50346	17
44	3684	40339	3366	42145	3063	44044	2775	46043	2503	48153	2246	50385	16
45	3678	40368	3360	42176	3058	44077	2771	46078	2499	48189	2241	50423	15
46	3673	40398	3355	42207	3053	44109	2766	46112	2494	48226	2237	50461	14
47	3667	40427	3350	42238	3048	44142	2761	46146	2490	48262	2233	50499	13
48	3662	40457	3345	42269	3043	44174	2757	46181	2485	48298	2229	50538	12
49	3657	40486	3340	42300	3038	44207	2752	46215	2481	48334	2225	50576	11
50	3651	40516	3335	42331	3033	44239	2748	46249	2477	48371	2221	50615	10
51	3646	40545	3329	42362	3029	44272	2743	46284	2472	48407	2216	50653	9
52	3640	40575	3324	42393	3024	44305	2738	46318	2468	48443	2212	50692	8
53	3635	40604	3319	42424	3019	44337	2734	46353	2463	48480	2208	50730	7
54	3630	40634	3314	42455	3014	44370	2729	46387	2459	48516	2204	50769	6
55	3624	40664	3309	42486	3009	44403	2724	46422	2455	48553	2200	50808	5
56	3619	40693	3304	42518	3004	44436	2720	46456	2450	48589	2196	50846	4
57	3613	40723	3299	42549	2999	44468	2715	46491	2446	48626	2192	50885	3
58	3608	40753	3294	42580	2994	44501	2711	46525	2442	48662	2188	50924	2
59	3603	40782	3289	42611	2990	44534	2706	46560	2437	48699	2183	50963	1
60	3597	40812	3283	42642	2985	44567	2701	46595	2433	48736	2179	51002	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	113°00′		112°00′		111°00′		110°00′		109°00′		108°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	72°00′		73°00′		74°00′		75°00′		76°00′		77°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	2179	51002	1940	53406	1716	55966	1506	58700	1310	61632	1128	64791	60
1	2175	51041	1936	53448	1712	56010	1502	58748	1306	61683	1125	64846	59
2	2171	51080	1933	53489	1709	56054	1499	58795	1303	61734	1122	64901	58
3	2167	51119	1929	53531	1705	56099	1495	58842	1300	61785	1119	64956	57
4	2163	51158	1925	53572	1701	56143	1492	58889	1297	61836	1116	65011	56
5	2159	51197	1921	53614	1698	56187	1489	58937	1294	61887	1113	65066	55
6	2155	51236	1917	53655	1694	56231	1485	58984	1291	61938	1110	65121	54
7	2151	51275	1913	53697	1691	56276	1482	59032	1288	61989	1107	65176	53
8	2147	51314	1910	53738	1687	56320	1479	59079	1284	62040	1104	65231	52
9	2143	51353	1906	53780	1683	56365	1475	59127	1281	62091	1101	65287	51
10	2138	51392	1902	53822	1680	56409	1472	59175	1278	62142	1099	65342	50
11	2134	51432	1898	53864	1676	56454	1469	59222	1275	62194	1096	65398	49
12	2130	51471	1894	53905	1673	56498	1465	59270	1272	62245	1093	65453	48
13	2126	51510	1890	53947	1669	56543	1462	59318	1269	62296	1090	65509	47
14	2122	51550	1887	53989	1665	56588	1459	59366	1266	62348	1087	65564	46
15	2118	51589	1883	54031	1662	56632	1455	59414	1263	62400	1084	65620	45
16	2114	51629	1879	54073	1658	56677	1452	59462	1260	62451	1081	65676	44
17	2110	51668	1875	54115	1655	56722	1449	59510	1257	62503	1079	65732	43
18	2106	51708	1871	54157	1651	56767	1445	59558	1253	62555	1076	65788	42
19	2102	51747	1868	54199	1648	56812	1442	59606	1250	62607	1073	65844	41
20	2098	51787	1864	54242	1644	56857	1439	59654	1247	62659	1070	65900	40
21	2094	51827	1860	54284	1641	56902	1435	59703	1244	62711	1067	65957	39
22	2090	51867	1856	54326	1637	56947	1432	59751	1241	62763	1064	66013	38
23	2086	51906	1853	54368	1634	56992	1429	59800	1238	62815	1061	66069	37
24	2082	51946	1849	54411	1630	57038	1425	59848	1235	62867	1059	66126	36
25	2078	51986	1845	54453	1627	57083	1422	59896	1232	62919	1056	66182	35
26	2074	52026	1841	54496	1623	57128	1419	59945	1229	62971	1053	66239	34
27	2070	52066	1837	54538	1619	57174	1416	59994	1226	63024	1050	66296	33
28	2066	52106	1834	54581	1616	57219	1412	60042	1223	63076	1047	66352	32
29	2062	52146	1830	54623	1612	57265	1409	60091	1220	63129	1045	66409	31
30	2058	52186	1826	54666	1609	57310	1406	60140	1217	63181	1042	66466	30
31	2054	52226	1823	54708	1605	57356	1403	60189	1214	63234	1039	66523	29
32	2050	52266	1819	54751	1602	57401	1399	60238	1211	63287	1036	66580	28
33	2046	52306	1815	54794	1598	57447	1396	60287	1208	63340	1033	66638	27
34	2042	52346	1811	54837	1595	57493	1393	60336	1205	63392	1031	66695	26
35	2038	52387	1808	54880	1591	57538	1390	60385	1202	63445	1028	66752	25
36	2034	52427	1804	54922	1588	57584	1386	60434	1199	63498	1025	66810	24
37	2030	52467	1800	54965	1584	57630	1383	60483	1196	63551	1022	66867	23
38	2026	52508	1796	55008	1581	57676	1380	60538	1193	63605	1020	66925	22
39	2022	52548	1793	55051	1578	57722	1377	60582	1190	63658	1017	66982	21
40	2018	52588	1789	55095	1574	57768	1373	60631	1187	63711	1014	67040	20
41	2014	52629	1785	55138	1571	57814	1370	60681	1184	63764	1011	67098	19
42	2010	52670	1782	55181	1567	57860	1367	60730	1181	63818	1008	67156	18
43	2007	52710	1778	55224	1564	57907	1364	60780	1178	63871	1006	67214	17
44	2003	52751	1774	55267	1560	57953	1360	60830	1175	63925	1003	67272	16
45	1999	52791	1771	55311	1557	57999	1357	60879	1172	63978	1000	67330	15
46	1995	52832	1767	55354	1553	58046	1354	60929	1169	64032	997	67388	14
47	1991	52873	1763	55397	1550	58092	1351	60979	1166	64086	995	67447	13
48	1987	52914	1760	55441	1546	58138	1348	61029	1163	64140	992	67505	12
49	1983	52954	1756	55484	1543	58185	1344	61079	1160	64194	989	67563	11
50	1979	52995	1752	55528	1540	58232	1341	61129	1157	64248	987	67622	10
51	1975	53036	1749	55572	1536	58278	1338	61179	1154	64302	984	67681	9
52	1971	53077	1745	55615	1533	58325	1335	61229	1151	64356	981	67739	8
53	1967	53118	1741	55659	1529	58372	1332	61279	1148	64410	978	67798	7
54	1964	53159	1738	55703	1526	58418	1329	61330	1145	64464	976	67857	6
55	1960	53200	1734	55746	1523	58465	1325	61380	1142	64518	973	67916	5
56	1956	53241	1730	55790	1519	58512	1322	61430	1139	64573	970	67975	4
57	1952	53283	1727	55834	1516	58559	1319	61481	1136	64627	968	68034	3
58	1948	53324	1723	55878	1512	58606	1316	61531	1133	64682	965	68093	2
59	1944	53365	1719	55922	1509	58653	1313	61582	1130	64736	962	68153	1
60	1940	53406	1716	55966	1506	58700	1310	61632	1128	64791	960	68212	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	107°00′		106°00′		105°00′		104°00′		103°00′		102°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

Always take "Z" from bottom of table, except when "K" is *same* name and *greater* than latitude, in which case take "Z" from *top* of table

′	78°00′		79°00′		80°00′		81°00′		82°00′		83°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	960	68212	805	71940	665	76033	538	80567	425	85644	325	91411	60
1	957	68272	803	72005	663	76105	536	80647	423	85734	323	91514	59
2	954	68331	800	72070	660	76176	534	80727	421	85825	322	91617	58
3	951	68391	798	72136	658	76248	532	80807	419	85915	320	91720	57
4	949	68450	796	72201	656	76320	530	80887	418	86006	319	91824	56
5	946	68510	793	72266	654	76393	528	80967	416	86096	317	91928	55
6	943	68570	791	72332	652	76465	526	81048	414	86187	316	92032	54
7	941	68630	788	72397	649	76537	524	81129	412	86278	314	92137	53
8	938	68690	786	72463	647	76610	522	81210	411	86370	313	92242	52
9	935	68750	783	72529	645	76683	520	81291	409	86461	311	92347	51
10	933	68811	781	72595	643	76756	518	81372	407	86553	310	92452	50
11	930	68871	779	72661	641	76828	516	81453	405	86645	308	92558	49
12	928	68931	776	72727	638	76902	514	81535	404	86737	307	92663	48
13	925	68992	774	72794	636	76975	512	81617	402	86829	305	92769	47
14	922	69053	771	72860	634	77048	510	81698	400	86922	304	92876	46
15	920	69113	769	72926	632	77122	508	81780	399	87015	302	92982	45
16	917	69174	767	72993	630	77195	506	81863	397	87107	301	93089	44
17	914	69235	764	73060	627	77269	504	81945	395	87201	299	93196	43
18	912	69296	762	73127	625	77343	503	82027	393	87294	298	93304	42
19	909	69357	759	73193	623	77417	501	82110	392	87387	296	93411	41
20	907	69418	757	73260	621	77491	499	82193	390	87481	295	93519	40
21	904	69479	755	73328	619	77565	497	82276	388	87575	293	93628	39
22	901	69541	752	73395	617	77639	495	82359	387	87669	292	93736	38
23	899	69602	750	73462	615	77714	493	82442	385	87764	290	93845	37
24	896	69664	747	73530	612	77788	491	82526	383	87858	289	93954	36
25	894	69725	745	73597	610	77863	489	82609	381	87953	287	94063	35
26	891	69787	743	73665	608	77938	487	82693	380	88048	286	94173	34
27	888	69849	740	73733	606	78013	485	82777	378	88143	284	94283	33
28	886	69910	738	73801	604	78088	483	82861	376	88239	283	94393	32
29	883	69972	736	73869	602	78164	482	82945	375	88334	281	94503	31
30	881	70034	733	73937	600	78239	480	83030	373	88430	280	94614	30
31	878	70097	731	74005	598	78315	478	83114	371	88526	279	94725	29
32	876	70159	729	74073	595	78390	476	83199	370	88623	277	94836	28
33	873	70221	726	74142	593	78466	474	83284	368	88719	276	94948	27
34	870	70284	724	74210	591	78542	472	83369	366	88816	274	95060	26
35	868	70346	722	74279	589	78618	470	83455	365	88913	273	95172	25
36	865	70409	719	74348	587	78694	468	83540	363	89010	271	95285	24
37	863	70471	717	74417	585	78771	467	83626	362	89107	270	95397	23
38	860	70534	715	74486	583	78847	465	83711	360	89205	269	95510	22
39	858	70597	712	74555	581	78924	463	83797	358	89303	267	95624	21
40	855	70660	710	74624	579	79001	461	83884	357	89401	266	95737	20
41	853	70723	708	74693	577	79078	459	83970	355	89499	264	95851	19
42	850	70786	706	74763	575	79155	457	84056	353	89597	263	95966	18
43	848	70850	703	74832	573	79232	455	84143	352	89696	262	96080	17
44	845	70913	701	74902	570	79309	454	84230	350	89795	260	96195	16
45	843	70976	699	74972	568	79387	452	84317	349	89894	259	96310	15
46	840	71040	696	75042	566	79465	450	84404	347	89994	257	96426	14
47	838	71104	694	75112	564	79542	448	84492	345	90093	256	96542	13
48	835	71167	692	75182	562	79620	446	84579	344	90193	255	96658	12
49	833	71231	690	75252	560	79698	444	84667	342	90293	253	96774	11
50	830	71295	687	75322	558	79777	443	84755	341	90394	252	96891	10
51	828	71359	685	75393	556	79855	441	84843	339	90494	251	97008	9
52	825	71423	683	75464	554	79933	439	84931	337	90595	249	97126	8
53	823	71488	680	75534	552	80012	437	85020	336	90696	248	97243	7
54	820	71552	678	75605	550	80091	435	85100	334	90798	247	97361	6
55	818	71616	676	75676	548	80170	434	85197	333	90899	245	97480	5
56	815	71681	674	75747	546	80249	432	85286	331	91001	244	97598	4
57	813	71746	672	75819	544	80328	430	85376	330	91103	243	97717	3
58	810	71810	669	75890	542	80407	428	85465	328	91205	241	97837	2
59	808	71875	667	75961	540	80487	426	85555	326	91308	240	97957	1
60	805	71940	665	76033	538	80567	425	85644	325	91411	239	98076	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	101°00′		100°00′		99°00′		98°00′		97°00′		96°00′		

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TABLE LI.—*Ageton table for meridian determinations*—Continued

When LHA (E or W) is *greater* than 90°, take "K" from *bottom* of table

′	84°00′		85°00′		86°00′		87°00′		88°00′		89°00′		′
	A	B	A	B	A	B	A	B	A	B	A	B	
0	238.6	98076	165.6	105970	105.9	115641	59.6	128120	26.5	145718	6.6	175814	60
1	237.2	98197	164.5	106115	105.0	115823	58.9	128362	26.0	146081	6.4	176544	59
2	235.9	98318	163.4	106260	104.2	116004	58.2	128605	25.6	146448	6.2	177287	58
3	234.6	98439	162.3	106406	103.3	116187	57.6	128849	25.2	146817	6.0	178042	57
4	233.3	98560	161.2	106552	102.4	116370	56.9	129095	24.7	147190	5.8	178810	56
5	232.0	98682	160.1	106698	101.6	116554	56.3	129342	24.3	147566	5.6	179593	55
6	230.7	98804	159.0	106846	100.7	116739	55.7	129591	23.9	147945	5.4	180390	54
7	229.4	98926	157.9	106993	99.8	116925	55.0	129841	23.5	148327	5.2	181201	53
8	228.1	99049	156.9	107141	99.0	117112	54.4	130093	23.1	148713	5.0	182029	52
9	226.8	99172	155.8	107290	98.1	117299	53.7	130346	22.6	149103	4.8	182872	51
10	225.5	99296	154.7	107439	97.3	117487	53.1	130600	22.2	149495	4.6	183732	50
11	224.2	99419	153.6	107589	96.4	117676	52.5	130856	21.8	149892	4.4	184609	49
12	222.9	99544	152.6	107739	95.6	117866	51.9	131114	21.4	150292	4.2	185505	48
13	221.6	99668	151.5	107890	94.7	118056	51.3	131373	21.0	150696	4.1	186419	47
14	220.3	99793	150.5	108041	93.9	118248	50.7	131633	20.6	151104	3.9	187353	46
15	219.1	99918	149.4	108193	93.1	118440	50.0	131896	20.3	151515	3.7	188307	45
16	217.8	100044	148.4	108345	92.3	118633	49.4	132159	19.9	151931	3.6	189283	44
17	216.5	100170	147.3	108498	91.4	118827	48.8	132425	19.5	152350	3.4	199082	43
18	215.3	100296	146.3	108651	90.6	119022	48.2	132692	19.1	152774	3.2	191303	42
19	214.0	100423	145.2	108805	89.8	119218	47.6	132961	18.7	153201	3.1	192350	41
20	212.8	100550	144.2	108960	89.0	119415	47.1	133231	18.4	153633	2.9	193522	40
21	211.5	100678	143.2	109115	88.2	119612	46.5	133503	18.0	154070	2.8	194522	39
22	210.3	100806	142.2	109270	87.4	119811	45.9	133777	17.6	154511	2.7	195650	38
23	209.0	100934	141.1	109426	86.6	120010	45.3	134052	17.3	154956	2.5	196808	37
24	207.8	101063	140.1	109583	85.8	120211	44.7	134330	16.9	155406	2.4	197998	36
25	206.5	101192	139.1	109740	85.0	120412	44.2	134609	16.6	155861	2.3	199221	35
26	205.3	101321	138.1	109898	84.2	120614	43.6	134890	16.2	156320	2.1	200480	34
27	204.1	101451	137.1	110057	83.4	120817	43.0	135173	15.9	156784	2.0	201777	33
28	202.8	101581	136.1	110216	82.6	121021	42.5	135457	15.6	157254	1.9	203113	32
29	201.6	101712	135.1	110375	81.9	121226	41.9	135744	15.2	157728	1.8	204492	31
30	200.4	101843	134.1	110536	81.1	121432	41.4	136032	14.9	158208	1.7	205916	30
31	199.2	101974	133.1	110696	80.3	121639	40.8	136322	14.6	158693	1.5	207388	29
32	198.0	102106	132.1	110858	79.5	121848	40.3	136615	14.2	159184	1.4	208912	28
33	196.8	102238	131.1	111020	78.8	122057	39.7	136909	13.9	159680	1.3	210491	27
34	195.6	102371	130.1	111183	78.0	122267	39.2	137205	13.6	160182	1.2	212130	26
35	194.4	102504	129.2	111346	77.3	122478	38.6	137503	13.3	160690	1.1	213834	25
36	193.2	102637	128.2	111510	76.5	122690	38.1	137804	13.0	161204	1.1	215607	24
37	192.0	102771	127.2	111674	75.8	122903	37.6	138106	12.7	161724	1.0	217455	23
38	190.8	102905	126.2	111839	75.0	123117	37.1	138411	12.4	162250	0.9	219385	22
39	189.6	103040	125.3	112005	74.3	123332	36.5	138718	12.1	162783	0.8	221406	21
40	188.4	103175	124.3	112171	73.5	123549	36.0	139027	11.8	163322	0.7	223525	20
41	187.2	103311	123.4	112338	72.8	123766	35.5	139338	11.5	163868	0.7	225752	19
42	186.1	103447	122.4	112506	72.1	123985	35.0	139651	11.2	164422	0.6	228100	18
43	184.9	103583	121.5	112674	71.3	124204	34.5	139967	10.9	164982	0.5	230583	17
44	183.7	103720	120.5	112843	70.6	124425	34.0	140285	10.6	165550	0.5	233215	16
45	182.6	103857	119.6	113013	69.9	124647	33.5	140605	10.3	166125	0.4	236018	15
46	181.4	103995	118.7	113183	69.2	124870	33.0	140928	10.1	166708	0.4	239015	14
47	180.3	104133	117.7	113354	68.5	125094	32.5	141253	9.8	167298	0.3	242233	13
48	179.1	104272	116.8	113526	67.8	125320	32.0	141581	9.5	167897	0.3	245709	12
49	178.0	104411	115.9	113699	67.1	125546	31.5	141911	9.3	168505	0.2	249488	11
50	176.8	104550	114.9	113872	66.4	125774	31.1	142243	9.0	169121	0.2	253627	10
51	175.7	104690	114.0	114045	65.7	126003	30.6	142579	8.7	169745	0.1	258203	9
52	174.5	104830	113.1	114220	65.0	126233	30.1	142916	8.5	170379	0.1	263318	8
53	173.4	104971	112.2	114395	64.3	126465	29.6	143257	8.2	171023	0.1	269118	7
54	172.3	105113	111.3	114571	63.6	126697	29.2	143600	8.0	171676	0.1	275812	6
55	171.1	105254	110.4	114747	62.9	126931	28.7	143946	7.8	172339	0.0	283304	5
56	170.0	105397	109.5	114925	62.2	127166	28.3	144295	7.5	173012	0.0	293421	4
57	168.9	105539	108.6	115103	61.6	127403	27.8	144646	7.3	173696	0.0	305915	3
58	167.8	105683	107.7	115282	60.9	127640	27.4	145000	7.1	174391	0.0	323524	2
59	166.7	105826	106.8	115461	60.2	127880	26.9	145358	6.8	175097	0.0	353627	1
60	165.6	105970	105.9	115641	59.6	128120	26.5	145718	6.6	175814	0.0	--------	0
′	A	B	A	B	A	B	A	B	A	B	A	B	′
	95°00′		94°00′		93°00′		92°00′		91°00′		90°00′		

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TABLE LII

COMMON LOGARITHMS OF CIRCULAR FUNCTIONS

(Sines, cosines, tangents, and cotangents for every hundredth of a degree of the quadrant)

0°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	—		—		—		100	
01	6. 24188	30103	6. 24188	30103	3. 75812	0. 00000	99	
02	6. 54291	17609	6. 54291	17609	3. 45709	0. 00000	98	
03	6. 71900	12494	6. 71900	12494	3. 28100	0. 00000	97	
04	6. 84394	9691	6. 84394	9691	3. 15606	0. 00000	96	
05	6. 94085	7918	6. 94085	7918	3. 05915	0. 00000	95	
06	7. 02003	6695	7. 02003	6695	2. 97997	0. 00000	94	
07	7. 08698	5799	7. 08698	5799	2. 91302	0. 00000	93	
08	7. 14497	5115	7. 14497	5115	2. 85503	0. 00000	92	
09	7. 19612	4576	7. 19612	4576	2. 80388	0. 00000	91	
10	7. 24188	4139	7. 24188	4139	2. 75812	0. 00000	90	
11	7. 28327	3779	7. 28327	3779	2. 71673	0. 00000	89	
12	7. 32106	3476	7. 32106	3476	2. 67894	0. 00000	88	
13	7. 35582	3218	7. 35582	3219	2. 64418	0. 00000	87	
14	7. 38800	2997	7. 38801	2996	2. 61199	0. 00000	86	
15	7. 41797	2803	7. 41797	2803	2. 58203	0. 00000	85	
16	7. 44600	2633	7. 44600	2633	2. 55400	0. 00000	84	
17	7. 47233	2482	7. 47233	2482	2. 52767	0. 00000	83	
18	7. 49715	2348	7. 49715	2348	2. 50285	0. 00000	82	
19	7. 52063	2228	7. 52063	2228	2. 47937	0 00000	81	
20	7. 54291	2119	7. 54291	2119	2. 45709	0. 00000	80	
21	7. 56410	2020	7. 56410	2020	2. 43590	0. 00000	79	
22	7. 58430	1930	7. 58430	1931	2. 41570	0. 00000	78	
23	7. 60360	1849	7. 60361	1848	2. 39639	0. 00000	77	
24	7. 62209	1773	7. 62209	1773	2. 37791	0. 00000	76	
25	7. 63982	1703	7. 63982	1703	2. 36018	0. 00000	75	
26	7. 65685	1639	7. 65685	1639	2. 34315	0. 00000	74	
27	7. 67324	1579	7. 67324	1580	2. 32676	0. 00000	73	
28	7. 68903	1524	7. 68904	1524	2. 31096	9. 99999	72	
29	7. 70427	1473	7. 70428	1472	2. 29572	9. 99999	71	
30	7. 71900	1424	7. 71900	1424	2. 28100	9. 99999	70	
31	7. 73324	1379	7. 73324	1379	2. 26676	9. 99999	69	
32	7. 74703	1336	7. 74703	1337	2. 25297	9. 99999	68	
33	7. 76039	1296	7. 76040	1296	2. 23960	9. 99999	67	
34	7. 77335	1259	7. 77336	1259	2. 22664	9. 99999	66	
35	7. 78594	1224	7. 78595	1224	2. 21405	9. 99999	65	
36	7. 79818	1190	7. 79819	1190	2. 20181	9. 99999	64	
37	7. 81008	1158	7. 81009	1158	2. 18991	9. 99999	63	
38	7. 82166	1128	7. 82167	1128	2. 17833	9. 99999	62	
39	7. 83294	1099	7. 83295	1099	2. 16705	9. 99999	61	
40	7. 84393	1073	7. 84394	1073	2. 15606	9. 99999	60	
41	7. 85466	1046	7. 85467	1046	2. 14533	9. 99999	59	
42	7. 86512	1022	7. 86513	1022	2. 13487	9. 99999	58	
43	7. 87534	999	7. 87535	999	2. 12465	9. 99999	57	
44	7. 88533	976	7. 88534	976	2. 11466	9. 99999	56	
45	7. 89509	954	7. 89510	954	2. 10490	9. 99999	55	
46	7. 90463	934	7. 90464	934	2. 09536	9. 99999	54	
47	7. 91397	914	7. 91398	915	2. 08602	9. 99999	53	
48	7. 92311	896	7. 92313	895	2. 07687	9. 99998	52	
49	7. 93207	877	7. 93208	878	2. 06792	9. 99998	51	
50	7. 94084		7. 94086		2. 05914	9. 99998	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
89°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

	0°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	7.94084	860	7.94086	860	2.05914	9.99998	50	
51	7.94944	843	7.94946	843	2.05054	9.99998	49	
52	7.95787	828	7.95789	828	2.04211	9.99998	48	
53	7.96615	811	7.96617	811	2.03383	9.99998	47	
54	7.97426	797	7.97428	797	2.02572	9.99998	46	
55	7.98223	783	7.98225	783	2.01775	9.99998	45	
56	7.99006	769	7.99008	769	2.00992	9.99998	44	
57	7.99775	755	7.99777	755	2.00223	9.99998	43	
58	8.00530	742	8.00532	742	1.99468	9.99998	42	
59	8.01272	730	8.01274	730	1.98726	9.99998	41	
60	8.02002	718	8.02004	718	1.97996	9.99998	40	
61	8.02720	706	8.02722	707	1.97278	9.99998	39	
62	8.03426	695	8.03429	695	1.96571	9.99997	38	
63	8.04121	684	8.04124	684	1.95876	9.99997	37	
64	8.04805	673	8.04808	673	1.95192	9.99997	36	
65	8.05478	663	8.05481	663	1.94519	9.99997	35	
66	8.06141	653	8.06144	653	1.93856	9.99997	34	
67	8.06794	644	8.06797	644	1.93203	9.99997	33	
68	8.07438	634	8.07441	634	1.92559	9.99997	32	
69	8.08072	624	8.08075	625	1.91925	9.99997	31	
70	8.08696	616	8.08700	616	1.91300	9.99997	30	
71	8.09312	608	8.09316	607	1.90684	9.99997	29	
72	8.09920	599	8.09923	599	1.90077	9.99997	28	
73	8.10519	591	8.10522	591	1.89478	9.99996	27	
74	8.11110	583	8.11113	583	1.88887	9.99996	26	
75	8.11693	575	8.11696	576	1.88304	9.99996	25	
76	8.12268	568	8.12272	567	1.87728	9.99996	24	
77	8.12836	560	8.12839	561	1.87161	9.99996	23	
78	8.13396	553	8.13400	553	1.86600	9.99996	22	
79	8.13949	546	8.13953	547	1.86047	9.99996	21	
80	8.14495	540	8.14500	539	1.85500	9.99996	20	
81	.15035	533	8.15039	533	1.84961	9.99996	19	
82	8.15568	526	8.15572	527	1.84428	9.99996	18	
83	8.16094	520	8.16099	520	1.83901	9.99995	17	
84	8.16614	514	8.16619	514	1.83381	9.99995	16	
85	8.17128	508	8.17133	508	1.82867	9.99995	15	
86	8.17636	502	8.17641	502	1.82359	9.99995	14	
87	8.18138	496	8.18143	496	1.81857	9.99995	13	
88	8.18634	491	8.18639	491	1.81361	9.99995	12	
89	8.19125	485	8.19130	486	1.80870	9.99995	11	
90	8.19610	480	8.19616	480	1.80384	9.99995	10	
91	8.20090	475	8.20096	474	1.79904	9.99995	09	
92	8.20565	469	8.20570	470	1.79430	9.99994	08	
93	8.21034	465	8.21040	464	1.78960	9.99994	07	
94	8.21499	459	8.21504	460	1.78496	9.99994	06	
95	8.21958	455	8.21964	455	1.78036	9.99994	05	
96	8.22413	450	8.22419	450	1.77581	9.99994	04	
97	8.22863	445	8.22869	446	1.77131	9.99994	03	
98	8.23308	441	8.23315	441	1.76685	9.99994	02	
99	8.23749	437	8.23756	436	1.76244	9.99994	01	
100	8.24186		8.24192		1.75808	9.99993	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
	89°							

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TABLE LII.—*Common logarithms of circular functions*—Continued

1°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	8. 24186	432	8. 24192	432	1. 75808	9. 99993	100	
01	8. 24618	427	8. 24624	428	1. 75376	9. 99993	99	
02	8. 25045	424	8. 25052	424	1. 74948	9. 99993	98	
03	8. 25469	420	8. 25476	420	1. 74524	9. 99993	97	
04	8. 25889	415	8. 25896	416	1. 74104	9. 99993	96	
05	8. 26304	412	8. 26312	411	1. 73688	9. 99993	95	
06	8. 26716	408	8. 26723	408	1. 73277	9. 99993	94	
07	8. 27124	404	8. 27131	404	1. 72869	9. 99992	93	
08	8. 27528	400	8. 27535	401	1. 72465	9. 99992	92	
09	8. 27928	396	8. 27936	396	1. 72064	9. 99992	91	
10	8. 28324	393	8. 28332	393	1. 71668	9. 99992	90	
11	8. 28717	390	8. 28725	390	1. 71275	9. 99992	89	
12	8. 29107	386	8. 29115	386	1. 70885	9. 99992	88	
13	8. 29493	382	8. 29501	383	1. 70499	9. 99992	87	
14	8. 29875	380	8. 29884	379	1. 70116	9. 99991	86	
15	8. 30255	376	8. 30263	376	1. 69737	9. 99991	85	
16	8. 30631	372	8. 30639	373	1. 69361	9. 99991	84	
17	8. 31003	370	8. 31012	370	1. 68988	9. 99991	83	
18	8. 31373	366	8. 31382	367	1. 68618	9. 99991	82	
19	8. 31739	364	8. 31749	363	1. 68251	9. 99991	81	
20	8. 32103	360	8. 32112	361	1. 67888	9. 99990	80	
21	8. 32463	357	8. 32473	357	1. 67527	9. 99990	79	
22	8. 32820	355	8. 32830	355	1. 67170	9. 99990	78	
23	8. 33175	352	8. 33185	352	1. 66815	9. 99990	77	
24	8. 33527	348	8. 33537	349	1. 66463	9. 99990	76	
25	8. 33875	346	8. 33886	346	1. 66114	9. 99990	75	
26	8. 34221	344	8. 34232	343	1. 65768	9. 99989	74	
27	8. 34565	340	8. 34575	341	1. 65425	9. 99989	73	
28	8. 34905	338	8. 34916	338	1. 65084	9. 99989	72	
29	8. 35243	335	8. 35254	336	1. 64746	9. 99089	71	
30	8. 35578	333	8. 35590	332	1. 64410	9. 99989	70	
31	8. 35911	330	8. 35922	331	1. 64078	9. 99989	69	
32	8. 36241	328	8. 36253	328	1. 63747	9. 99988	68	
33	8. 36569	325	8. 36581	325	1. 63419	9. 99988	67	
34	8. 36894	323	8. 36906	323	1. 63094	9. 99988	66	
35	8. 37217	321	8. 37229	321	1. 62771	9. 99988	65	
36	8. 37538	318	8. 37550	318	1. 62450	9. 99988	64	
37	8. 37856	315	8. 37868	316	1. 62132	9. 99988	63	
38	8. 38171	314	8. 38184	314	1. 61816	9. 99987	62	
39	8. 38485	311	8. 38498	311	1. 61502	9. 99987	61	
40	8. 38796	309	8. 38809	309	1. 61191	9. 99987	60	
41	8. 39105	307	8. 39118	307	1. 60882	9. 99987	59	
42	8. 39412	305	8. 39425	305	1. 60575	9. 99987	58	
43	8. 39717	302	8. 39730	303	1. 60270	9. 99986	57	
44	8. 40019	301	8. 40033	301	1. 59967	9. 99986	56	
45	8. 40320	298	8. 40334	298	1. 59666	9. 99986	55	
46	8. 40618	297	8. 40632	297	1. 59368	9. 99986	54	
47	8. 40915	294	8. 40929	295	1. 59071	9. 99986	53	
48	8. 41209	292	8. 41224	292	1. 58776	9. 99986	52	
49	8. 41501	291	8. 41516	291	1. 58484	9. 99985	51	
50	8. 41792		8. 41807		1. 58193	9. 99985	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
88°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

1°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	8. 41792	288	8. 41807	288	1. 58193	9, 99985	50	
51	8. 42080	287	8. 42095	287	1. 57905	9. 99985	49	
52	8. 42367	285	8. 42382	285	1. 57618	9. 99985	48	
53	8. 42652	283	8. 42667	283	1. 57333	9. 99985	47	
54	8. 42935	281	8. 42950	282	1. 57050	9. 99984	46	
55	8. 43216	279	8. 43232	279	1. 56768	9. 99984	45	
56	8. 43495	277	8. 43511	278	1. 56489	9. 99984	44	
57	8. 43772	276	8. 43789	275	1. 56211	9. 99984	43	
58	8. 44048	274	8. 44064	275	1. 55936	9. 99983	42	
59	8. 44322	272	8. 44339	272	1. 55661	9. 99983	41	
60	8. 44594	271	8. 44611	271	1. 55389	9. 99983	40	
61	8. 44865	268	8. 44882	269	1. 55118	9. 99983	39	
62	8. 45133	268	8. 45151	267	1. 54849	9. 99983	38	
63	8. 45401	265	8. 45418	266	1. 54582	9. 99982	37	
64	8. 45666	264	8. 45684	264	1. 54316	9. 99982	36	
65	8. 45930	262	8. 45948	263	1. 54052	9. 99982	35	
66	8. 46192	261	8. 46211	261	1. 53789	9. 99982	34	
67	8. 46453	259	8. 46472	259	1. 53528	9. 99982	33	
68	8. 46712	258	8. 46731	258	1. 53269	9. 99981	32	
69	8. 46970	256	8. 46989	256	1. 53011	9. 99981	31	
70	8. 47226	255	8. 47245	255	1. 52755	9. 99981	30	
71	8. 47481	253	8. 47500	254	1. 52500	9. 99981	29	
72	8. 47734	252	8. 47754	252	1. 52246	9. 99980	28	
73	8. 47986	250	8. 48006	250	1. 51994	9. 99980	27	
74	8. 48236	249	8. 48256	249	1. 51744	9. 99980	26	
75	8. 48485	247	8. 48505	248	1. 51495	9. 99980	25	
76	8. 48732	246	8. 48753	246	1. 51247	9. 99980	24	
77	8. 48978	245	8. 48999	245	1. 51001	9. 99979	23	
78	8. 49223	243	8. 49244	243	1. 50756	9. 99979	22	
79	8. 49466	242	8. 49487	242	1. 50513	9. 99979	21	
80	8. 49708	240	8. 49729	241	1. 50271	9. 99979	20	
81	8. 49948	240	8. 49970	239	1. 50030	9. 99978	19	
82	8. 50188	237	8. 50209	239	1. 49791	9. 99978	18	
83	8. 50425	237	8. 50448	236	1. 49552	9. 99978	17	
84	8. 50662	235	8. 50684	236	1. 49316	9. 99978	16	
85	8. 50897	234	8. 50920	234	1. 49080	9. 99977	15	
86	8. 51131	233	8. 51154	233	1. 48846	9. 99977	14	
87	8. 51364	232	8. 51387	232	1. 48613	9. 99977	13	
88	8. 51596	230	8. 51619	231	1. 48381	9. 99977	12	
89	8. 51826	229	8. 51850	229	1. 48150	9. 99976	11	
90	8. 52055	228	8. 52079	228	1. 47921	9. 99976	10	
91	8. 52283	227	8. 52307	227	1. 47693	9. 99976	09	
92	8. 52510	225	8. 52534	226	1. 47466	9. 99976	08	
93	8. 52735	225	8. 52760	225	1. 47240	9. 99975	07	
94	8. 52960	223	8. 52985	223	1. 47015	9. 99975	06	
95	8. 53183	222	8. 53208	222	1. 46792	9. 99975	05	
96	8. 53405	221	8. 53430	221	1. 46570	9. 99975	04	
97	8. 53626	220	8. 53651	221	1. 46349	9. 99974	03	
98	8. 53846	218	8. 53872	219	1. 46128	9. 99974	02	
99	8. 54064	218	8. 54091	217	1. 45909	9. 99974	01	
100	8. 54282		8. 54308		1. 45692	9. 99974	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

2°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	8.54282	216	8.54308	217	1.45692	9.99974	100	
01	8.54498	216	8.54525	216	1.45475	9.99973	99	
02	8.54714	214	8.54741	215	1.45259	9.99973	98	
03	8.54928	214	8.54956	213	1.45044	9.99973	97	
04	8.55142	212	8.55169	213	1.44831	9.99972	96	
05	8.55354	211	8.55382	211	1.44618	9.99972	95	
06	8.55565	210	8.55593	211	1.44407	9.99972	94	
07	8.55775	210	8.55804	209	1.44196	9.99972	93	
08	8.55985	208	8.56013	209	1.43987	9.99971	92	
09	8.56193	207	8.56222	207	1.43778	9.99971	91	
10	8.56400	206	8.56429	207	1.43571	9.99971	90	
11	8.56606	205	8.56636	205	1.43364	9.99971	89	
12	8.56811	205	8.56841	205	1.43159	9.99970	88	
13	8.57016	203	8.57046	203	1.42954	9.99970	87	
14	8.57219	202	8.57249	203	1.42751	9.99970	86	
15	8.57421	202	8.57452	202	1.42548	9.99969	85	
16	8.57623	200	8.57654	200	1.42346	9.99969	84	
17	8.57823	200	8.57854	200	1.42146	9.99969	83	
18	8.58023	199	8.58054	199	1.41946	9.99969	82	
19	8.58222	197	8.58253	198	1.41747	9.99968	81	
20	8.58419	197	8.58451	198	1.41549	9.99968	80	
21	8.58616	196	8.58649	196	1.41351	9.99968	79	
22	8.58812	195	8.58845	195	1.41155	9.99967	78	
23	8.59007	194	8.59040	195	1.40960	9.99967	77	
24	8.59201	194	8.59235	193	1.40765	9.99967	76	
25	8.59395	192	8.59428	193	1.40572	9.99967	75	
26	8.59587	192	8.59621	192	1.40379	9.99966	74	
27	8.59779	191	8.59813	191	1.40187	9.99966	73	
28	8.59970	190	8.60004	190	1.39996	9.99966	72	
29	8.60160	189	8.60194	190	1.39806	9.99965	71	
30	8.60349	188	8.60384	188	1.39616	9.99965	70	
31	8.60537	188	8.60572	188	1.39428	9.99965	69	
32	8.60725	186	8.60760	187	1.39240	9.99964	68	
33	8.60911	186	8.60947	186	1.39053	9.99964	67	
34	8.61097	185	8.61133	186	1.38867	9.99964	66	
35	8.61282	185	8.61319	185	1.38681	9.99963	65	
36	8.61467	183	8.61504	183	1.38496	9.99963	64	
37	8.61650	183	8.61687	183	1.38313	9.99963	63	
38	8.61833	182	8.61870	183	1.38130	9.99963	62	
39	8.62015	181	8.62053	181	1.37947	9.99962	61	
40	8.62196	181	8.62234	181	1.37766	9.99962	60	
41	8.62377	179	8.62415	180	1.37585	9.99962	59	
42	8.62556	179	8.62595	179	1.37405	9.99961	58	
43	8.62735	179	8.62774	179	1.37226	9.99961	57	
44	8.62914	177	8.62953	178	1.37047	9.99961	56	
45	8.63091	177	8.63131	177	1.36869	9.99960	55	
46	8.63268	176	8.63308	176	1.36692	9.99960	54	
47	8.63444	175	8.63484	176	1.36516	9.99960	53	
48	8.63619	175	8.63660	175	1.36340	9.99959	52	
49	8.63794	174	8.63835	174	1.36165	9.99959	51	
50	8.63968		8.64009		1.35991	9.99959	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
87°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

2°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	8.63968	173	8.64009	174	1.35991	9.99959	50	
51	8.64141	173	8.64183	173	1.35817	9.99958	49	
52	8.64314	172	8.64356	172	1.35644	9.99958	48	
53	8.64486	171	8.64528	172	1.35472	9.99958	47	
54	8.64657	170	8.64700	170	1.35300	9.99957	46	
55	8.64827	170	8.64870	171	1.35130	9.99957	45	
56	8.64997	169	8.65041	169	1.34959	9.99957	44	
57	8.65166	169	8.65210	169	1.34790	9.99956	43	
58	8.65335	168	8.65379	168	1.34621	9.99956	42	
59	8.65503	167	8.65547	168	1.34453	9.99956	41	
60	8.65670	167	8.65715	167	1.34285	9.99955	40	
61	8.65837	166	8.65882	166	1.34118	9.99955	39	
62	8.66003	165	8.66048	166	1.33952	9.99955	38	
63	8.66168	165	8.66214	165	1.33786	9.99954	37	
64	8.66333	164	8.66379	164	1.33621	9.99954	36	
65	8.66497	163	8.66543	164	1.33457	9.99954	35	
66	8.66660	163	8.66707	163	1.33293	9.99953	34	
67	8.66823	162	8.66870	163	1.33130	9.99953	33	
68	8.66985	162	8.67033	162	1.32967	9.99952	32	
69	8.67147	161	8.67195	161	1.32805	9.99952	31	
70	8.67308	160	8.67356	161	1.32644	9.99952	30	
71	8.67468	160	8.67517	160	1.32483	9.99951	29	
62	8.67628	160	8.67677	160	1.32323	9.99951	28	
73	8.67788	158	8.67837	159	1.32163	9.99951	27	
74	8.67946	158	8.67996	158	1.32004	9.99950	26	
75	8.68104	158	8.68154	158	1.31846	9.99950	25	
76	8.68262	157	8.68312	158	1.31688	9.99950	24	
77	8.68419	156	8.68470	156	1.31530	9.99949	23	
78	8.68575	156	8.68626	157	1.31374	9.99949	22	
79	8.68731	155	8.68783	155	1.31217	9.99948	21	
80	8.68886	155	8.68938	155	1.31062	9.99948	20	
81	8.69041	154	8.69093	155	1.30907	9.99948	19	
82	8.69195	154	8.69248	154	1.30752	9.99947	18	
83	8.69349	153	8.69402	153	1.30598	9.99947	17	
84	8.69402	152	8.69555	153	1.30445	9.99947	16	
85	8.69654	152	8.69708	152	1.30292	9.99946	15	
86	8.69806	152	8.69860	152	1.30140	9.99946	14	
87	8.69958	151	8.70012	152	1.29988	9.99945	13	
88	8.70109	150	8.70164	150	1.29836	9.99945	12	
89	8.70259	150	8.70314	151	1.29686	9.99945	11	
90	8.70409	149	8.70465	149	1.29535	9.99944	10	
91	8.70558	149	8.70614	150	1.29386	9.99944	09	
92	8.70707	149	8.70764	148	1.29236	9.99944	08	
93	8.70856	147	8.70912	149	1.29088	9.99943	07	
94	8.71003	148	8.71061	147	1.28939	9.99943	06	
95	8.71151	147	8.71208	148	1.28792	9.99942	05	
96	8.71298	146	8.71356	146	1.28644	9.99942	04	
97	8.71444	146	8.71502	147	1.28498	9.99942	03	
98	8.71590	145	8.71649	145	1.28351	9.99941	02	
99	8.71735	145	8.71794	146	1.28206	9.99941	01	
100	8.71880		8.71940		1.28060	9.99940	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
87°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

	3°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	8.71880	144	8.71940	144	1.28060	9.99940	100	145 143
01	8.72024	144	8.72084	145	1.27916	9.99940	99	1 14.5 14.3
02	8.72168	144	8.72229	144	1.27771	9.99940	98	2 29.0 28.6
03	8.72312	143	8.72373	143	1.27627	9.99939	97	3 43.5 42.9
04	8.72455	142	8.72516	143	1.27484	9.99939	96	4 58.0 57.2
05	8.72597	142	8.72659	142	1.27341	9.99938	95	5 72.5 71.5
06	8.72739	142	8.72801	142	1.27199	9.99938	94	6 87.0 85.8
07	8.72881	141	8.72943	142	1.27057	9.99938	93	7 101.5 100.1
08	8.73022	141	8.73085	141	1.26915	9.99937	92	8 116.0 114.4
09	8.73163	140	8.73226	140	1.26774	9.99937	91	9 130.5 128.7
10	8.73303	139	8.73366	140	1.26634	9.99936	90	141 139
11	8.73442	140	8.73506	140	1.26494	9.99936	89	1 14.1 13.9
12	8.73582	139	8.73646	139	1.26354	9.99936	88	2 28.2 27.8
13	8.73721	138	8.73785	139	1.26215	9.99935	87	3 42.3 41.7
14	8.73859	138	8.73924	139	1.26076	9.99935	86	4 56.4 55.6
15	8.73997	137	8.74063	138	1.25937	9.99934	85	5 70.5 69.5
16	8.74134	138	8.74201	137	1.25799	9.99934	84	6 84.6 83.4
17	8.74272	136	8.74338	137	1.25662	9.99933	83	7 98.7 97.3
18	8.74408	136	8.74475	137	1.25525	9.99933	82	8 112.8 111.2
19	8.74544	136	8.74612	136	1.25388	9.99933	81	9 126.9 125.1
20	8.74680	136	8.74748	136	1.25252	9.99932	80	138 137
21	8.74816	134	8.74884	135	1.25116	9.99932	79	1 13.8 13.7
22	8.74950	135	8.75019	135	1.24981	9.99931	78	2 27.6 27.4
23	8.75085	134	8.75154	135	1.24846	9.99931	77	3 41.4 41.1
24	8.75219	134	8.75289	134	1.24711	9.99931	76	4 55.2 54.8
25	8.75353	133	8.75423	133	1.24577	9.99930	75	5 69.0 68.5
26	8.75486	133	8.75556	134	1.24444	9.99930	74	6 82.8 82.2
27	8.75619	132	8.75690	133	1.24310	9.99929	73	7 96.6 95.9
28	8.75751	132	8.75823	132	1.24177	9.99929	72	8 110.4 109.6
29	8.75883	132	8.75955	132	1.24045	9.99928	71	9 124.2 123.3
30	8.76015	131	8.76087	132	1.23913	9.99928	70	135 133
31	8.76146	131	8.76219	131	1.23781	9.99927	69	1 13.5 13.3
32	8.76277	131	8.76350	131	1.23650	9.99927	68	2 27.0 26.6
33	8.76408	130	8.76481	131	1.23519	9.99927	67	3 40.5 39.9
34	8.76538	129	8.76612	130	1.23388	9.99926	66	4 54.0 53.2
35	8.76667	130	8.76742	129	1.23258	9.99926	65	5 67.5 66.5
36	8.76797	129	8.76871	130	1.23129	9.99925	64	6 81.0 79.8
37	8.76926	128	8.77001	129	1.22999	9.99925	63	7 94.5 93.1
38	8.77054	128	8.77130	128	1.22870	9.99924	62	8 108.0 106.4
39	8.77182	128	8.77258	129	1.22742	9.99924	61	9 121.5 119.7
40	8.77310	128	8.77387	127	1.22613	9.99923	60	131 129
41	8.77438	127	8.77514	128	1.22486	9.99923	59	1 13.1 12.9
42	8.77565	126	8.77642	127	1.22358	9.99923	58	2 26.2 25.8
43	8.77691	126	8.77769	127	1.22231	9.99922	57	3 39.3 38.7
44	8.77817	126	8.77896	126	1.22104	9.99922	56	4 52.4 51.6
45	8.77943	126	8.78022	126	1.21978	9.99921	55	5 65.5 64.5
46	8.78069	125	8.78148	126	1.21852	9.99921	54	6 78.6 77.4
47	8.78194	125	8.78274	125	1.21726	9.99920	53	7 91.7 90.3
48	8.78319	124	8.78399	125	1.21601	9.99920	52	8 104.8 103.2
49	8.78443	125	8.78524	125	1.21476	9.99919	51	9 117.9 116.1
50	8.78568		8.78649		1.21351	9.99919	50	128 127
								1 12.8 12.7
								2 25.6 25.4
								3 38.4 38.1
								4 51.2 50.8
								5 64.0 63.5
								6 76.8 76.2
								7 89.6 88.9
								8 102.4 101.6
								9 115.2 114.3
								125 124
								1 12.5 12.4
								2 25.0 24.8
								3 37.5 37.2
								4 50.0 49.6
								5 62.5 62.0
								6 75.0 74.4
								7 87.5 86.8
								8 100.0 99.2
								9 112.5 111.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
	86°							

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TABLE LII.—*Common logarithms of circular functions*—Continued

3°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.	
50	8.78568	123	8.78649	124	1.21351	9.99919	50		
								123	122
51	8.78691	124	8.78773	124	1.21227	9.99918	49	1 12.3	12.2
52	8.78815	123	8.78897	123	1.21103	9.99918	48	2 24.6	24.4
53	8.78938	122	8.79020	123	1.20980	9.99918	47	3 36.9	36.6
								4 49.2	48.8
54	8.79060	123	8.79143	123	1.20857	9.99917	46	5 61.5	61.0
55	8.79183	122	8.79266	123	1.20734	9.99917	45	6 73.8	73.2
56	8.79305	121	8.79389	122	1.20611	9.99916	44	7 86.1	85.4
								8 98.4	97.6
57	8.79426	122	8.79511	122	1.20489	9.99916	43	9 110.7	109.8
58	8.79548	121	8.79633	121	1.20367	9.99915	42		
59	8.79669	120	8.79754	121	1.20246	9.99915	41		121 119
								1 12.1	11.9
60	8.79789	121	8.79875	121	1.20125	9.99914	40	2 24.2	23.8
								3 36.3	35.7
61	8.79910	120	8.79996	120	1.20004	9.99914	39	4 48.4	47.6
62	8.80030	119	8.80116	121	1.19884	9.99913	38	5 60.5	59.5
63	8.80149	120	8.80237	119	1.19763	9.99913	37	6 72.6	71.4
								7 84.7	83.3
64	8.80269	119	8.80356	120	1.19644	9.99912	36	8 96.8	95.2
65	8.80388	118	8.80476	119	1.19524	9.99912	35	9 108.9	107.1
66	8.80506	119	8.80595	119	1.19405	9.99911	34		
									118 117
67	8.80625	118	8.80714	118	1.19286	9.99911	33	1 11.8	11.7
68	8.80743	117	8.80832	118	1.19168	9.99910	32	2 23.6	23.4
69	8.80860	118	8.80950	118	1.19050	9.99910	31	3 35.4	35.1
								4 47.2	46.8
70	8.80978	117	8.81068	118	1.18932	9.99909	30	5 59.0	58.5
								6 70.8	70.2
71	8.81095	117	8.81186	117	1.18814	9.99909	29	7 82.6	81.9
72	8.81212	116	8.81303	117	1.18697	9.99908	28	8 94.4	93.6
73	8.81328	116	8.81420	117	1.18580	9.99908	27	9 106.2	105.3
									116 115
74	8.81444	116	8.81537	116	1.18463	9.99907	26	1 11.6	11.5
75	8.81560	115	8.81653	116	1.18347	9.99907	25	2 23.2	23.0
76	8.81675	116	8.81769	116	1.18231	9.99906	24	3 34.8	34.5
								4 46.4	46.0
77	8.81791	114	8 81885	115	1.18115	9.99906	23	5 58.0	57.5
78	8.81905	115	8.82000	115	1.18000	9.99905	22	6 69.6	69.0
79	8.82020	114	8.82115	115	1.17885	9.99905	21	7 81.2	80.5
								8 92.8	92.0
80	8.82134	114	8.82230	114	1.17770	9.99904	20	9 104.4	103.5
									114 113
81	8.82248	114	8.82344	114	1.17656	9.99904	19	1 11.4	11.3
82	8.82362	113	8.82458	114	1.17542	9.99903	18	2 22.8	22.6
83	8.82475	113	8.82572	114	1.17428	9.99903	17	3 34.2	33.9
								4 45.6	45.2
84	8.82588	113	8.82686	113	1.17314	9.99902	16	5 57.0	56.5
85	8.82701	113	8.82799	113	1.17201	9.99902	15	6 68.4	67.8
86	8.82814	112	8.82912	113	1.17088	9.99901	14	7 79.8	79.1
								8 91.2	90.4
87	8.82926	112	8.83025	112	1.16975	9.99901	13	9 102.6	101.7
88	8.83038	111	8.83137	112	1.16863	9.99900	12		
89	8.83149	112	8.83249	112	1.16751	9.99900	11		112 111
								1 11.2	11.1
90	8.83261	111	8.83361	112	1.16639	9.99899	10	2 22.4	22.2
								3 33.6	33.3
91	8.83372	110	8.83473	111	1.16527	9.99899	09	4 44.8	44.4
92	8.83482	111	8.83584	111	1.16416	9.99898	08	5 56.0	55.5
93	8.83593	110	8.83695	111	1.16305	9.99898	07	6 67.2	66.6
								7 78.4	77.7
94	8.83703	110	8.83806	110	1.16194	9.99897	06	8 89.6	88.8
95	8.83813	110	8.83916	110	1.16084	9.99897	05	9 100.8	99.9
96	8.83923	109	8.84026	110	1.15974	9.99896	04		
									109 108
97	8.84032	109	8.84136	110	1.15864	9.99896	03	1 10.9	10.8
98	8.84141	109	8.84246	109	1.15754	9.99895	02	2 21.8	21.6
99	8.84250	108	8.84355	109	1.15645	9.99895	01	3 32.7	32.4
								4 43.6	43.2
100	8.84358		8.84464		1.15536	9.99894	00	5 54.5	54.0
								6 65.4	64.8
								7 76.3	75.6
								8 87.2	86.4
								9 98.1	97.2
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.	

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TABLE LII.—*Common logarithms of circular functions*—Continued

4°									
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.	
00	8.84358	109	8.84464	109	1.15536	9.99894	100	109	108
01	8.84467	108	8.84573	109	1.15427	9.99894	99	1 10.9	10.8
02	8.84575	107	8.84682	108	1.15318	9.99893	98	2 21.8	21.6
03	8.84682	108	8.84790	108	1.15210	9.99892	97	3 32.7	32.4
04	8.84790	107	8.84898	108	1.15102	9.99892	96	4 43.6	43.2
05	8.84897	107	8.85006	107	1.14994	9.99891	95	5 54.5	54.0
06	8.85004	107	8.85113	107	1.14887	9.99891	94	6 65.4	64.8
07	8.85111	106	8.85220	107	1.14780	9.99890	93	7 76.3	75.6
08	8.85217	106	8.85327	107	1.14673	9.99890	92	8 87.2	86.4
09	8.85323	106	8.85434	106	1.14566	9.99889	91	9 98.1	97.2
10	8.85429	106	8.85540	106	1.14460	9.99889	90	107	106
11	8.85535	105	8.85646	106	1.14354	9.99888	89	1 10.7	10.6
12	8.85640	105	8.85752	106	1.14248	9.99888	88	2 21.4	21.2
13	8.85745	105	8.85858	105	1.14142	9.99887	87	3 32.1	31.8
14	8.85850	105	8.85963	106	1.14037	9.99887	86	4 42.8	42.4
15	8.85955	104	8.86069	104	1.13931	9.99886	85	5 53.5	53.0
16	8.86059	104	8.86173	105	1.13827	9.99885	84	6 64.2	63.6
17	8.86163	104	8.86278	105	1.13722	9.99885	83	7 74.9	74.2
18	8.86267	103	8.86383	104	1.13617	9.99884	82	8 85.6	84.8
19	8.86370	104	8.86487	104	1.13513	9.99884	81	9 96.3	95.4
20	8.86474	103	8.86591	103	1.13409	9.99883	80	105	104
21	8.86577	103	8.86694	104	1.13306	9.99883	79	1 10.5	10.4
22	8.86680	102	8.86798	103	1.13202	9.99882	78	2 21.0	20.8
23	8.86782	103	8.86901	103	1.13099	9.99882	77	3 31.5	31.2
24	8.86885	102	8.87004	102	1.12996	9.99881	76	4 42.0	41.6
25	8.86987	102	8.87106	103	1.12894	9.99880	75	5 52.5	52.0
26	8.87089	101	8.87209	102	1.12791	9.99880	74	6 63.0	62.4
27	8.87190	102	8.87311	102	1.12689	9.99879	73	7 73.5	72.8
28	8.87292	101	8.87413	102	1.12587	9.99879	72	8 84.0	83.2
29	8.87393	101	8.87515	101	1.12485	9.99878	71	9 94.5	93.6
30	8.87494	100	8.87616	101	1.12384	9.99878	70	103	102
31	8.87594	101	8.87717	102	1.12283	9.99877	69	1 10.3	10.2
32	8.87695	100	8.87819	100	1.12181	9.99876	68	2 20.6	20.4
33	8.87795	100	8.87919	101	1.12081	9.99876	67	3 30.9	30.6
34	8.87895	100	8.88020	100	1.11980	9.99875	66	4 41.2	40.8
35	8.87995	99	8.88120	100	1.11880	9.99875	65	5 51.5	51.0
36	8.88094	100	8.88220	100	1.11780	9.99874	64	6 61.8	61.2
37	8.88194	99	8.88320	100	1.11680	9.99874	63	7 72.1	71.4
38	8.88293	99	8.88420	99	1.11580	9.99873	62	8 82.4	81.6
39	8.88392	98	8.88519	99	1.11481	9.99872	61	9 92.7	91.8
40	8.88490	99	8.88618	99	1.11382	9.99872	60	101	100
41	8.88589	98	8.88717	99	1.11283	9.99871	59	1 10.1	10.0
42	8.88687	98	8.88816	99	1.11184	9.99871	58	2 20.2	20.0
43	8.88785	98	8.88915	98	1.11085	9.99870	57	3 30.3	30.0
44	8.88883	97	8.89013	98	1.10987	9.99869	56	4 40.4	40.0
45	8.88980	97	8.89111	98	1.10889	9.99869	55	5 50.5	50.0
46	8.89077	97	8.89209	98	1.10791	9.99868	54	6 60.6	60.0
47	8.89174	97	8.89307	97	1.10693	9.99868	53	7 70.7	70.0
48	8.89271	97	8.89404	97	1.10596	9.99867	52	8 80.8	80.0
49	8.89368	96	8.89501	97	1.10499	9.99867	51	9 90.9	90.0
50	8.89464		8.89598		1.10402	9.99866	50	99	98
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		1 9.9	9.8
								2 19.8	19.6
								3 29.7	29.4
								4 39.6	39.2
								5 49.5	49.0
								6 59.4	58.8
								7 69.3	68.6
								8 79.2	78.4
								9 89.1	88.2
								97	96
								1 9.7	9.6
								2 19.4	19.2
								3 29.1	28.8
								4 38.8	38.4
								5 48.5	48.0
								6 58.2	57.6
								7 67.9	67.2
								8 77.6	76.8
								9 87.3	86.4
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TABLE LII.—*Common logarithms of circular functions*—Continued

4°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	8.89464		8.89598		1.10402	9.99866	50	
		97		97				97 96
51	8.89561	96	8.89695	97	1.10305	9.99865	49	1 9.7 9.6
52	8.89657	95	8.89792	96	1.10208	9.99865	48	2 19.4 19.2
53	8.89752	96	8.89888	96	1.10112	9.99864	47	3 29.1 28.8
								4 38.8 38.4
54	8.89848	95	8.89984	96	1.10016	9.99864	46	5 48.5 48.0
55	8.89943	95	8.90080	96	1.09920	9.99863	45	6 58.2 57.6
56	8.90038	95	8.90176	96	1.09824	9.99862	44	7 67.9 67.2
								8 77.6 76.8
57	8.90133	95	8.90272	95	1.09728	9.99862	43	9 87.3 86.4
58	8.90228	95	8.90367	95	1.09633	9.99861	42	95
59	8.90323	94	8.90462	95	1.09538	9.99860	41	1 9.5
								2 19.0
60	8.90417	94	8.90557	95	1.09443	9.99860	40	3 28.5
								4 38.0
61	8.90511	94	8.90652	94	1.09348	9.99859	39	5 47.5
62	8.90605	94	8.90746	95	1.09254	9.99859	38	6 57.0
63	8.90699	93	8.90841	94	1.09159	9.99858	37	7 66.5
								8 76.0
64	8.90792	93	8.90935	94	1.09065	9.99857	36	9 85.5
65	8.90885	93	8.91029	93	1.08971	9.99857	35	94 93
66	8.90978	93	8.91122	94	1.08878	9.99856	34	1 9.4 9.3
								2 18.8 18.6
67	8.91071	93	8.91216	93	1.08784	9.99856	33	3 28.2 27.9
68	8.91164	93	8.91309	93	1.08691	9.99855	32	4 37.6 37.2
69	8.91257	92	8.91402	93	1.08598	9.99854	31	5 47.0 46.5
								6 56.4 55.8
70	8.91349	92	8.91495	93	1.08505	9.99854	30	7 65.8 65.1
								8 75.2 74.4
71	8.91441	92	8.91588	92	1.08412	9.99853	29	9 84.6 83.7
72	8.91533	92	8.91680	93	1.08320	9.99852	28	92
73	8.91625	91	8.91773	92	1.08227	9.99852	27	1 9.2
								2 18.4
74	8.91716	91	8.91865	92	1.08135	9.99851	26	3 27.6
75	8.91807	91	8.91957	92	1.08043	9.99851	25	4 36.8
76	8.91898	91	8.92049	91	1.07951	9.99850	24	5 46.0
								6 55.2
77	8.91989	91	8.92140	91	1.07860	9.99849	23	7 64.4
78	8.92080	91	8.92231	92	1.07769	9.99849	22	8 73.6
79	8.92171	90	8.92323	91	1.07677	9.99848	21	9 82.8
								91 90
80	8.92261	90	8.92414	90	1.07586	9.99847	20	1 9.1 9.0
								2 18.2 18.0
81	8.92351	90	8.92504	91	1.07496	9.99847	19	3 27.3 27.0
82	8.92441	90	8.92595	90	1.07405	9.99846	18	4 36.4 36.0
83	8.92531	90	8.92685	91	1.07315	9.99846	17	5 45.5 45.0
								6 54.6 54.0
84	8.92621	89	8.92776	90	1.07224	9.99845	16	7 63.7 63.0
85	8.92710	89	8.92866	90	1.07134	9.99844	15	8 72.8 72.0
86	8.92799	89	8.92956	89	1.07044	9.99844	14	9 81.9 81.0
								89
87	8.92888	89	8.93045	90	1.06955	9.99843	13	1 8.9
88	8.92977	89	8.93135	89	1.06865	9.99842	12	2 17.8
89	8.93066	88	8.93224	89	1.06776	9.99842	11	3 26.7
								4 35.6
90	8.93154	89	8.93313	89	1.06687	9.99841	10	5 44.5
								6 53.4
91	8.93243	88	8.93402	89	1.06598	9.99840	09	7 62.3
92	8.93331	88	8.93491	89	1.06509	9.99840	08	8 71.2
93	8.93419	88	8.93580	88	1.06420	9.99839	07	9 80.1
								88 87
94	8.93507	87	8.93668	88	1.06332	9.99838	06	1 8.8 8.7
95	8.93594	88	8.93756	89	1.06244	9.99838	05	2 17.6 17.4
96	8.93682	87	8.93845	87	1.06155	9.99837	04	3 26.4 26.1
								4 35.2 34.8
97	8.93769	87	8.93932	88	1.06068	9.99836	03	5 44.0 43.5
98	8.93856	87	8.94020	88	1.05980	9.99836	02	6 52.8 52.2
99	8.93943	87	8.94108	87	1.05892	9.99835	01	7 61.6 60.9
								8 70.4 69.6
100	8.94030		8.94195		1.05805	9.99834	00	9 79.2 78.3
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

5°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	8.94030		8.94195		1.05805	9.99834	100	
		86		87				87 86
01	8.94116	87	8.94282	87	1.05718	9.99834	99	1 8.7 8.6
02	8.94203	86	8.94369	87	1.05631	9.99833	98	2 17.4 17.2
03	8.94289	86	8.94456	87	1.05544	9.99832	97	3 26.1 25.8
								4 34.8 34.4
04	8.94375	86	8.94543	87	1.05457	9.99832	96	5 43.5 43.0
05	8.94461	85	8.94630	86	1.05370	9.99831	95	6 52.2 51.6
06	8.94546	86	8.94716	86	1.05284	9.99830	94	7 60.9 60.2
								8 69.6 68.8
07	8.94632	85	8.94802	86	1.05198	9.99830	93	9 78.3 77.4
08	8.94717	85	8.94888	86	1.05112	9.99829	92	
09	8.94802	85	8.94974	86	1.05026	9.99828	91	
								85 84
10	8.94887	85	8.95060	85	1.04940	9.99828	90	1 8.5 8.4
								2 17.0 16.8
11	8.94972	85	8.95145	86	1.04855	9.99827	89	3 25.5 25.2
12	8.95057	84	8.95231	85	1.04769	9.99826	88	4 34.0 33.6
13	8.95141	85	8.95316	85	1.04684	9.99826	87	5 42.5 42.0
								6 51.0 50.4
14	8.95226	84	8.95401	85	1.04599	9.99825	86	7 59.5 58.8
15	8.95310	84	8.95486	84	1.04514	9.99824	85	8 68.0 67.2
16	8.95394	84	8.95570	85	1.04430	9.99824	84	9 76.5 75.6
17	8.95478	84	8.95655	84	1.04345	9.99823	83	83
18	8.95562	83	8.95739	84	1.04261	9.99822	82	1 8.3
19	8.95645	83	8.95823	85	1.04177	9.99822	81	2 16.6
								3 24.9
20	8.95728	84	8.95908	83	1.04092	9.99821	80	4 33.2
								5 41.5
21	8.95812	83	8.95991	84	1.04009	9.99820	79	6 49.8
22	8.95895	83	8.96075	84	1.03925	9.99820	78	7 58.1
23	8.95978	82	8.96159	83	1.03841	9.99819	77	8 66.4
								9 74.7
24	8.96060	83	8.96242	83	1.03758	9.99818	76	
25	8.96143	82	8.96325	84	1.03675	9.99817	75	
26	8.96225	83	8.96409	83	1.03591	9.99817	74	82 81
								1 8.2 8.1
27	8.96308	82	8.96492	82	1.03508	9.99816	73	2 16.4 16.2
28	8.96390	82	8.96574	83	1.03426	9.99815	72	3 24.6 24.3
29	8.96472	81	8.96657	82	1.03343	9.99815	71	4 32.8 32.4
								5 41.0 40.5
30	8.96553	82	8.96739	83	1.03261	9.99814	70	6 49.2 48.6
								7 57.4 56.7
31	8.96635	81	8.96822	82	1.03178	9.99813	69	8 65.6 64.8
32	8.96716	82	8.96904	82	1.03096	9.99813	68	9 73.8 72.9
33	8.96798	81	8.96986	82	1.03014	9.99812	67	
								80
34	8.96879	81	8.97068	82	1.02932	9.99811	66	1 8.0
35	8.96960	81	8.97150	81	1.02850	9.99810	65	2 16.0
36	8.97041	81	8.97231	82	1.02769	9.99810	64	3 24.0
								4 32.0
37	8.97122	80	8.97313	81	1.02687	9.99809	63	5 40.0
38	8.97202	81	8.97394	81	1.02606	9.99808	62	6 48.0
39	8.97283	80	8.97475	81	1.02525	9.99808	61	7 56.0
								8 64.0
40	8.97363	80	8.97556	81	1.02444	9.99807	60	9 72.0
41	8.97443	80	8.97637	80	1.02363	9.99806	59	
42	8.97523	80	8.97717	81	1.02283	9.99805	58	
43	8.97603	79	8.97798	80	1.02202	9.99805	57	79 78
								1 7.9 7.8
44	8.97682	80	8.97878	81	1.02122	9.99804	56	2 15.8 15.6
45	8.97762	79	8.97959	80	1.02041	9.99803	55	3 23.7 23.4
46	8.97841	79	8.98039	80	1.01961	9.99803	54	4 31.6 31.2
								5 39.5 39.0
47	8.97920	80	8.98119	80	1.01881	9.99802	53	6 47.4 46.8
48	8.98000	78	8.98199	79	1.01801	9.99801	52	7 55.3 54.6
49	8.98078	79	8.98278	80	1.01722	9.99800	51	8 63.2 62.4
								9 71.1 70.2
50	8.98157		8.98358		1.01642	9.99800	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

5°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	8.98157		8.98358		1.01642	9.99800	50	
		79		79				79 78
51	8.98236	78	8.98437	79	1.01563	9.99799	49	1 7.9 7.8
52	8.98314	79	8.98516	79	1.01484	9.99798	48	2 15.8 15.6
53	8.98393	78	8.98595	79	1.01405	9.99797	47	3 23.7 23.4
54	8.98471	78	8.98674	79	1.01326	9.99797	46	4 31.6 31.2
55	8.98549	78	8.98753	79	1.01247	9.99796	45	5 39.5 39.0
56	8.98627	78	8.98832	78	1.01168	9.99795	44	6 47.4 46.8
57	8.98705	77	8.98910	79	1.01090	9.99794	43	7 55.3 54.6
58	8.98782	78	8.98989	78	1.01011	9.99794	42	8 63.2 62.4
59	8.98860	77	8.99067	78	1.00933	9.99793	41	9 71.1 70.2
60	8.98937	78	8.99145	78	1.00855	9.99792	40	77
								1 7.7
61	8.99015	77	8.99223	78	1.00777	9.99791	39	2 15.4
62	8.99092	77	8.99301	78	1.00699	9.99791	38	3 23.1
63	8.99169	76	8.99379	77	1.00621	9.99790	37	4 30.8
								5 38.5
64	8.99245	77	8.99456	78	1.00544	9.99789	36	6 46.2
65	8.99322	77	8.99534	77	1.00466	9.99788	35	7 53.9
66	8.99399	76	8.99611	77	1.00389	9.99788	34	8 61.6
								9 69.3
67	8.99475	76	8.99688	77	1.00312	9.99787	33	
68	8.99551	77	8.99765	77	1.00235	9.99786	32	76
69	8.99628	76	8.99842	77	1.00158	9.99785	31	1 7.6
								2 15.2
70	8.99704	75	8.99919	76	1.00081	9.99785	30	3 22.8
								4 30.4
71	8.99779	76	8.99995	77	1.00005	9.99784	29	5 38.0
72	8.99855	76	9.00072	76	0.99928	9.99783	28	6 45.6
73	8.99931	75	9.00148	77	0.99852	9.99782	27	7 53.2
								8 60.8
74	9.00006	76	9.00225	76	0.99775	9.99782	26	9 68.4
75	9.00082	75	9.00301	76	0.99699	9.99781	25	
76	9.00157	75	9.00377	75	0.99623	9.99780	24	75 74
77	9.00232	75	9.00452	76	0.99548	9.99779	23	1 7.5 7.4
78	9.00307	75	9.00528	76	0.99472	9.99779	22	2 15.0 14.8
79	9.00382	74	9.00604	75	0.99396	9.99778	21	3 22.5 22.2
								4 30.0 29.6
80	9.00456	75	9.00679	76	0.99321	9.99777	20	5 37.5 37.0
								6 45.0 44.4
81	9.00531	74	9.00755	75	0.99245	9.99776	19	7 52.5 51.8
82	9.00605	75	9.00830	75	0.99170	9.99776	18	8 60.0 59.2
83	9.00680	74	9.00905	75	0.99095	9.99775	17	9 67.5 66.6
84	9.00754	74	9.00980	75	0.99020	9.99774	16	73
85	9.00828	74	9.01055	74	0.98945	9.99773	15	
86	9.00902	74	9.01129	75	0.98871	9.99772	14	1 7.3
								2 14.6
87	9.00976	73	9.01204	74	0.98796	9.99772	13	3 21.9
88	9.01049	74	9.01278	75	0.98722	9.99771	12	4 29.2
89	9.01123	73	9.01353	74	0.98647	9.99770	11	5 36.5
								6 43.8
90	9.01196	73	9.01427	74	0.98573	9.99769	10	7 51.1
								8 58.4
91	9.01269	74	9.01501	74	0.98499	9.99769	09	9 65.7
92	9.01343	73	9.01575	74	0.98425	9.99768	08	
93	9.01416	73	9.01649	73	0.98351	9.99767	07	72
								1 7.2
94	9.01489	72	9.01722	74	0.98278	9.99766	06	2 14.4
95	9.01561	73	9.01796	73	0.98204	9.99765	05	3 21.6
96	9.01634	73	9.01869	74	0.98131	9.99765	04	4 28.8
								5 36.0
97	9.01707	72	9.01943	73	0.98057	9.99764	03	6 43.2
98	9.01779	72	9.02016	73	0.97984	9.99763	02	7 50.4
99	9.01851	72	9.02089	73	0.97911	9.99762	01	8 57.6
								9 64.8
100	9.01923		9.02162		0.97838	9.99761	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

6°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.01923		9.02162		0.97838	9.99761	100	73
		73		73				1 7.3
01	9.01996	71	9.02235	73	0.97765	9.99761	99	2 14.6
02	9.02067	72	9.02308	72	0.97692	9.99760	98	3 21.9
03	9.02139	72	9.02380	73	0.97620	9.99759	97	4 29.2
								5 36.5
04	9.02211	72	9.02453	72	0.97547	9.99758	96	6 43.8
05	9.02283	71	9.02525	72	0.97475	9.99757	95	7 51.1
06	9.02354	71	9.02597	73	0.97403	9.99757	94	8 58.4
								9 65.7
07	9.02425	72	9.02670	72	0.97330	9.99756	93	
08	9.02497	71	9.02742	71	0.97258	9.99755	92	
09	9.02568	71	9.02813	72	0.97187	9.99754	91	72 71
10	9.02639	71	9.02885	72	0.97115	9.99753	90	1 7.2 7.1
								2 14.4 14.2
11	9.02710	70	9.02957	71	0.97043	9.99753	89	3 21.6 21.3
12	9.02780	71	9.03028	72	0.96972	9.99752	88	4 28.8 28.4
13	9.02851	70	9.03100	71	0.96900	9.99751	87	5 36.0 35.5
								6 43.2 42.6
14	9.02921	71	9.03171	71	0.96829	9.99750	86	7 50.4 49.7
15	9.02992	70	9.03242	72	0.96758	9.99749	85	8 57.6 56.8
16	9.03062	70	9.03314	71	0.96686	9.99749	84	9 64.8 63.9
17	9.03132	70	9.03385	70	0.96615	9.99748	83	70
18	9.03202	70	9.03455	71	0.96545	9.99747	82	1 7.0
19	9.03272	70	9.03526	71	0.96474	9.99746	81	2 14.0
								3 21.0
20	9.03342	70	9.03597	70	0.96403	9.99745	80	4 28.0
								5 35.0
21	9.03412	69	9.03667	71	0.96333	9.99744	79	6 42.0
22	9.03481	70	9.03738	70	0.96262	9.99744	78	7 49.0
23	9.03551	69	9.03808	70	0.96192	9.99743	77	8 56.0
								9 63.0
24	9.03620	70	9.03878	70	0.96122	9.99742	76	
25	9.03690	69	9.03948	70	0.96052	9.99741	75	
26	9.03759	69	9.04018	70	0.95982	9.99740	74	69 68
27	9.03828	69	9.04088	70	0.95912	9.99739	73	1 6.9 6.8
28	9.03897	69	9.04158	70	0.95842	9.99739	72	2 13.8 13.6
29	9.03966	68	9.04228	69	0.95772	9.99738	71	3 20.7 20.4
								4 27.6 27.2
30	9.04034	69	9.04297	70	0.95703	9.99737	70	5 34.5 34.0
								6 41.4 40.8
31	9.04103	68	9.04367	69	0.95633	9.99736	69	7 48.3 47.6
32	9.04171	69	9.04436	69	0.95564	9.99735	68	8 55.2 54.4
33	9.04240	68	9.04505	69	0.95495	9.99734	67	9 62.1 61.2
34	9.04308	68	9.04574	69	0.95426	9.99734	66	
35	9.04376	68	9.04643	69	0.95357	9.99733	65	67
36	9.04444	68	9.04712	69	0.95288	9.99732	64	1 6.7
								2 13.4
37	9.04512	68	9.04781	69	0.95219	9.99731	63	3 20.1
38	9.04580	68	9.04850	68	0.95150	9.99730	62	4 26.8
39	9.04648	67	9.04918	69	0.95082	9.99729	61	5 33.5
								6 40.2
40	9.04715	68	9.04987	68	0.95013	9.99728	60	7 46.9
								8 53.6
41	9.04783	67	9.05055	69	0.94945	9.99728	59	9 60.3
42	9.04850	68	9.05124	68	0.94876	9.99727	58	
43	9.04918	67	9.05192	68	0.94808	9.99726	57	66
								1 6.6
44	9.04985	67	9.05260	68	0.94740	9.99725	56	2 13.2
45	9.05052	67	9.05328	68	0.94672	9.99724	55	3 19.8
46	9.05119	67	9.05396	67	0.94604	9.99723	54	4 26.4
								5 33.0
47	9.05186	67	9.05463	68	0.94537	9.99723	53	6 39.6
48	9.05253	66	9.05531	68	0.94469	9.99722	52	7 46.2
49	9.05319	67	9.05599	67	0.94401	9.99721	51	8 52.8
								9 59.4
50	9.05386		9.05666		0.94334	9.99720	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

6°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.05386	66	9.05666	67	0.94334	9.99720	50	68
51	9.05452	67	9.05733	68	0.94267	9.99719	49	1 6.8
52	9.05519	66	9.05801	67	0.94199	9.99718	48	2 13.6
53	9.05585	66	9.05868	67	0.94132	9.99717	47	3 20.4
54	9.05651	66	9.05935	67	0.94065	9.99716	46	4 27.2
55	9.05717	66	9.06002	66	0.93998	9.99716	45	5 34.0
56	9.05783	66	9.06068	67	0.93932	9.99715	44	6 40.8
57	9.05849	66	9.06135	67	0.93865	9.99714	43	7 47.6
58	9.05915	65	9.06202	66	0.93798	9.99713	42	8 54.4
59	9.05980	66	9.06268	67	0.93732	9.99712	41	9 61.2
60	9.06046	66	9.06335	66	0.93665	9.99711	40	67 66
61	9.06112	65	9.06401	66	0.93599	9.99710	39	1 6.7 6.6
62	9.06177	65	9.06467	67	0.93533	9.99709	38	2 13.4 13.2
63	9.06242	65	9.06534	66	0.93466	9.99709	37	3 20.1 19.8
64	9.06307	65	0.06600	66	0.93400	9.99708	36	4 26.8 26.4
65	9.06372	65	9.06666	65	0.93334	9.99707	35	5 33.5 33.0
66	9.06437	65	9.06731	66	0.93269	9.99706	34	6 40.2 39.6
67	9.06502	65	9.06797	66	0.93203	9.99705	33	7 46.9 46.2
68	9.06567	65	9.06863	65	0.93137	9.99704	32	8 53.6 52.8
69	9.06632	64	9.06928	66	0.93072	9.99703	31	9 60.3 59.4
70	9.06696	65	9.06994	65	0.93006	9.99702	30	65
71	9.06761	64	9.07059	65	0.92941	9.99701	29	1 6.5
72	9.06825	64	9.07124	66	0.92876	9.99701	28	2 13.0
73	9.06889	65	9.07190	65	0.92810	9.99700	27	3 19.5
74	9.06954	64	9.07255	65	0.92745	9.99699	26	4 26.0
75	9.07018	64	9.07320	65	0.92680	9.99698	25	5 32.5
76	9.07082	63	9.07385	64	0.92615	9.99697	24	6 39.0
77	9.07145	64	9.07449	65	0.92551	9.99696	23	7 45.5
78	9.07209	64	9.07514	65	0.92486	9.99695	22	8 52.0
79	9.07273	64	9.07579	64	0.92421	9.99694	21	9 58.5
80	9.07337	63	9.07643	65	0.92357	9.99693	20	64 63
81	9.07400	64	9.07708	64	0.92292	9.99693	19	1 6.4 6.3
82	9.07464	63	9.07772	64	0.92228	9.99692	18	2 12.8 12.6
83	9.07527	63	9.07836	64	0.92164	9.99691	17	3 19.2 18.9
84	9.07590	63	9.07900	64	0.92100	9.99690	16	4 25.6 25.2
85	9.07653	63	9.07964	64	0.92036	9.99689	15	5 32.0 31.5
86	9.07716	63	9.08028	64	0.91972	9.99688	14	6 38.4 37.8
87	9.07779	63	9.08092	64	0.91908	9.99687	13	7 44.8 44.1
88	9.07842	63	9.08156	64	0.91844	9.99686	12	8 51.2 50.4
89	9.07905	63	9.08220	63	0.91780	9.99685	11	9 57.6 56.7
90	9.07968	62	9.08283	64	0.91717	9.99684	10	62
91	9.08030	63	9.08347	63	0.91653	9.99683	09	1 6.2
92	9.08093	62	9.08410	64	0.91590	9.99682	08	2 12.4
93	9.08155	62	9.08474	63	0.91526	9.99682	07	3 18.6
94	9.08217	63	9.08537	63	0.91463	9.99681	06	4 24.8
95	9.08280	62	9.08600	63	0.91400	9.99680	05	5 31.0
96	9.08342	62	9.08663	63	0.91337	9.99679	04	6 37.2
97	9.08404	62	9.08726	63	0.91274	9.99678	03	7 43.4
98	9.08466	62	9.08789	63	0.91211	9.99677	02	8 49.6
99	9.08528	61	9.08852	62	0.91148	9.99676	01	9 55.8
100	9.08589		9.08914		0.91086	9.99675	00	61
								1 6.1
								2 12.2
								3 18.3
								4 24.4
								5 30.5
								6 36.6
								7 42.7
								8 48.8
								9 54.9
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

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	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9. 08589	62	9. 08914	63	0. 91086	9. 99675	100	
01	9. 08651	62	9. 08977	63	0. 91023	9. 99674	99	63
02	9. 08713	61	9. 09040	62	0. 90960	9. 99673	98	1 6. 3
03	9. 08774	62	9. 09102	62	0. 90898	9. 99672	97	2 12. 6
04	9. 08836	61	9. 09164	63	0. 90836	9. 99671	96	3 18. 9
05	9. 08897	61	9. 09227	62	0. 90773	9. 99670	95	4 25. 2
06	9. 08958	61	9. 09289	62	0. 90711	9. 99669	94	5 31. 5
07	9. 09019	61	9. 09351	62	0. 90649	9. 99669	93	6 37. 8
08	9. 09080	61	9. 09413	62	0. 90587	9. 99668	92	7 44. 1
09	9. 09141	61	9. 09475	62	0. 90525	9. 99667	91	8 50. 4
10	9. 09202	61	9. 09537	61	0. 90463	9. 99666	90	9 56. 7
11	9. 09263	61	9. 09598	62	0. 90402	9. 99665	89	62
12	9. 09324	61	9. 09660	62	0. 90340	9. 99664	88	1 6. 2
13	9. 09385	60	9. 09722	61	0. 90278	9. 99663	87	2 12. 4
14	9. 09445	61	9. 09783	62	0. 90217	9. 99662	86	3 18. 6
15	9. 09506	60	9. 09845	61	0. 90155	9. 99661	85	4 24. 8
16	9. 09566	60	9. 09906	61	0. 90094	9. 99660	84	5 31. 0
17	9. 09626	60	9. 09967	61	0. 90033	9. 99659	83	6 37. 2
18	9. 09686	61	9. 10028	61	0. 89972	9. 99658	82	7 43. 4
19	9. 09747	60	9. 10089	61	0. 89911	9. 99657	81	8 49. 6
20	9. 09807	60	9. 10150	61	0. 89850	9. 99656	80	9 55. 8
21	9. 09867	59	9. 10211	61	0. 89789	9. 99655	79	61
22	9. 09926	60	9. 10272	61	0. 89728	9. 99654	78	1 6. 1
23	9. 09986	60	9. 10333	61	0. 89667	9. 99653	77	2 12. 2
24	9. 10046	60	9. 10394	60	0. 89606	9. 99652	76	3 18. 3
25	9. 10106	59	9. 10454	61	0. 89546	9. 99651	75	4 24. 4
26	9. 10165	60	9. 10515	60	0. 89485	9. 99650	74	5 30. 5
27	9. 10225	59	9. 10575	60	0. 89425	9. 99649	73	6 36. 6
28	9. 10284	59	9. 10635	61	0. 89365	9. 99648	72	7 42. 7
29	9. 10343	59	9. 10696	60	0. 89304	9. 99648	71	8 48. 8
30	9. 10402	60	9. 10756	60	0. 89244	9. 99647	70	9 54. 9
31	9. 10462	59	9. 10816	60	0. 89184	9. 99646	69	60
32	9. 10521	59	9. 10876	60	0. 89124	9. 99645	68	1 6. 0
33	9. 10580	58	9. 10936	60	0. 89064	9. 99644	67	2 12. 0
34	9. 10638	59	9. 10996	60	0. 89004	9. 99643	66	3 18. 0
35	9. 10697	59	9. 11056	59	0. 88944	9. 99642	65	4 24. 0
36	9. 10756	59	9. 11115	60	0. 88885	9. 99641	64	5 30. 0
37	9. 10815	58	9. 11175	59	0. 88825	9. 99640	63	6 36. 0
38	9. 10873	59	9. 11234	60	0. 88766	9. 99639	62	7 42. 0
39	9. 10932	58	9. 11294	59	0. 88706	9. 99638	61	8 48. 0
40	9. 10990	58	9. 11353	60	0. 88647	9. 99637	60	9 54. 0
41	9. 11048	59	9. 11413	59	0. 88587	9. 99636	59	59
42	9. 11107	58	9. 11472	59	0. 88528	9. 99635	58	1 5. 9
43	9. 11165	58	9. 11531	59	0. 88469	9. 99634	57	2 11. 8
44	9. 11223	58	9. 11590	59	0. 88410	9. 99633	56	3 17. 7
45	9. 11281	58	9. 11649	59	0. 88351	9. 99632	55	4 23. 6
46	9. 11339	58	9. 11708	59	0. 88292	9. 99631	54	5 29. 5
47	9. 11397	57	9. 11767	59	0. 88233	9. 99630	53	6 35. 4
48	9. 11454	58	9. 11826	58	0. 88174	9. 99629	52	7 41. 3
49	9. 11512	58	9. 11884	59	0. 88116	9. 99628	51	8 47. 2
50	9. 11570		9. 11943		0. 88057	9. 99627	50	9 53. 1
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

7°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9. 11570	57	9. 11943	58	0. 88057	9. 99627	50	
51	9. 11627	58	9. 12001	59	0. 87999	9. 99626	49	59
52	9. 11685	57	9. 12060	58	0. 87940	9. 99625	48	1 5. 9
53	9. 11742	57	9. 12118	59	0. 87882	9. 99624	47	2 11. 8
								3 17. 7
54	9. 11799	58	9. 12177	58	0. 87823	9. 99623	46	4 23. 6
55	9. 11857	57	9. 12235	58	0. 87765	9. 99622	45	5 29. 5
56	9. 11914	57	9. 12293	58	0. 87707	9. 99621	44	6 35. 4
								7 41. 3
57	9. 11971	57	9. 12351	58	0. 87649	9. 99620	43	8 47. 2
58	9. 12028	57	9. 12409	58	0. 87591	9. 99619	42	9 53. 1
59	9. 12085	57	9. 12467	58	0. 87533	9. 99618	41	
								58
60	9. 12142	56	9. 12525	58	0. 87475	9. 99617	40	1 5. 8
								2 11. 6
61	9. 12198	57	9. 12583	57	0. 87417	9. 99616	39	3 17. 4
62	9. 12255	57	9. 12640	58	0. 87360	9. 99615	38	4 23. 2
63	9. 12312	56	9. 12698	58	0. 87302	9. 99614	37	5 29. 0
								6 34. 8
64	9. 12368	57	9. 12756	57	0. 87244	9. 99613	36	7 40. 6
65	9. 12425	56	9. 12813	57	0. 87187	9. 99612	35	8 46. 4
66	9. 12481	56	9. 12870	58	0. 87130	9. 99611	34	9 52. 2
67	9. 12537	57	9. 12928	57	0. 87072	9. 99610	33	57
68	9. 12594	56	9. 12985	57	0. 87015	9. 99609	32	1 5. 7
69	9. 12650	56	9. 13042	57	0. 86958	9. 99608	31	2 11. 4
								3 17. 1
70	9. 12706	56	9. 13099	57	0. 86901	9. 99607	30	4 22. 8
								5 28. 5
71	9. 12762	56	9. 13156	57	0. 86844	9. 99606	29	6 34. 2
72	9. 12818	56	9. 13213	57	0. 86787	9. 99605	28	7 39. 9
73	9. 12874	56	9. 13270	57	0. 86730	9. 99604	27	8 45. 6
								9 51. 3
74	9. 12930	55	9. 13327	57	0. 86673	9. 99603	26	
75	9. 12985	56	9. 13384	57	0. 86616	9. 99601	25	
76	9. 13041	56	9. 13441	56	0. 86559	9. 99600	24	
								56
77	9. 13097	55	9. 13497	57	0. 86503	9. 99599	23	1 5. 6
78	9. 13152	56	9. 13554	56	0. 86446	9. 99598	22	2 11. 2
79	9. 13208	55	9. 13610	57	0. 86390	9. 99597	21	3 16. 8
								4 22. 4
80	9. 13263	55	9. 13667	56	0. 86333	9. 99596	20	5 28. 0
								6 33. 6
81	9. 13318	55	9. 13723	56	0. 86277	9. 99595	19	7 39. 2
82	9. 13373	56	9. 13779	56	0. 86221	9. 99594	18	8 44. 8
83	9. 13429	55	9. 13835	57	0. 86165	9. 99593	17	9 50. 4
								55
84	9. 13484	55	9. 13892	56	0. 86108	9. 99592	16	
85	9. 13539	55	9. 13948	56	0. 86052	9. 99591	15	1 5. 5
86	9. 13594	55	9. 14004	56	0. 85996	9. 99590	14	2 11. 0
								3 16. 5
87	9. 13649	54	9. 14060	55	0. 85940	9. 99589	13	4 22. 0
88	9. 13703	55	9. 14115	56	0. 85885	9. 99588	12	5 27. 5
89	9. 13758	55	9. 14171	56	0. 85829	9. 99587	11	6 33. 0
								7 38. 5
90	9. 13813	54	9. 14227	56	0. 85773	9. 99586	10	8 44. 0
								9 49. 5
91	9. 13867	55	9. 14283	55	0. 85717	9. 99585	09	
92	9. 13922	54	9. 14338	56	0. 85662	9. 99584	08	54
93	9. 13976	55	9. 14394	55	0. 85606	9. 99553	07	1 5. 4
								2 10. 8
94	9. 14031	54	9. 14449	55	0. 85551	9. 99582	06	3 16. 2
95	9. 14085	54	9. 14504	56	0. 85496	9. 99581	05	4 21. 6
96	9. 14139	54	9. 14560	55	0. 85440	9. 99580	04	5 27. 0
								6 32. 4
97	9. 14193	55	9. 14615	55	0. 85385	9. 99578	03	7 37. 8
98	9. 14248	54	9. 14670	55	0. 85330	9. 99577	02	8 43. 2
99	9. 14302	54	9. 14725	55	0. 85275	9. 99576	01	9 48. 6
100	9. 14356		9. 14780		0. 85220	9. 99575	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

8°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.14356	53	9.14780	55	0.85220	9.99575	100	
01	9.14409	54	9.14835	55	0.85165	9.99574	99	55
02	9.14463	54	9.14890	55	0.85110	9.99573	98	1 5.5
03	9.14517	54	9.14945	55	0.85055	9.99572	97	2 11.0
04	9.14571	53	9.15000	54	0.85000	9.99571	96	3 16.5
05	9.14624	54	9.15054	55	0.84946	9.99570	95	4 22.0
06	9.14678	53	9.15109	55	0.84891	9.99569	94	5 27.5
07	9.14731	54	9.15164	54	0.84836	9.99568	93	6 33.0
08	9.14785	53	9.15218	55	0.84782	9.99567	92	7 38.5
09	9.14838	53	9.15273	54	0.84727	9.99566	91	8 44.0
10	9.14891	54	9.15327	54	0.84673	9.99565	90	9 49.5
11	9.14945	53	9.15381	54	0.84619	9.99563	89	54
12	9.14998	53	9.15435	55	0.84565	9.99562	88	1 5.4
13	9.15051	53	9.15490	54	0.84510	9.99561	87	2 10.8
14	9.15104	53	9.15544	54	0.84456	9.99560	86	3 16.2
15	9.15157	53	9.15598	54	0.84402	9.99559	85	4 21.6
16	9.15210	53	9.15652	54	0.84348	9.99558	84	5 27.0
17	9.15263	52	9.15706	54	0.84294	9.99557	83	6 32.4
18	9.15315	53	9.15760	53	0.84240	9.99556	82	7 37.8
19	9.15368	53	9.15813	54	0.84187	9.99555	81	8 43.2
20	9.15421	52	9.15867	54	0.84133	9.99554	80	9 48.6
21	9.15473	53	9.15921	53	0.84079	9.99553	79	53
22	9.15526	52	9.15974	54	0.84026	9.99552	78	1 5.3
23	9.15578	53	9.16028	53	0.83972	9.99550	77	2 10.6
24	9.15631	52	9.16081	54	0.83919	9.99549	76	3 15.9
25	9.15683	52	9.16135	53	0.83865	9.99548	75	4 21.2
26	9.15735	52	9.16188	53	0.83812	9.99547	74	5 26.5
27	9.15787	53	9.16241	54	0.83759	9.99546	73	6 31.8
28	9.15840	52	9.16295	53	0.83705	9.99545	72	7 37.1
29	9.15892	52	9.16348	53	0.83652	9.99544	71	8 42.4
30	9.15944	51	9.16401	53	0.83599	9.99543	70	9 47.7
31	9.15995	52	9.16454	53	0.83546	9.99542	69	52
32	9.16047	52	9.16507	53	0.83493	9.99540	68	1 5.2
33	9.16099	52	9.16560	53	0.83440	9.99539	67	2 10.4
34	9.16151	52	9.16613	52	0.83387	9.99538	66	3 15.6
35	9.16203	51	9.16665	53	0.83335	9.99537	65	4 20.8
36	9.16254	52	9.16718	53	0.83282	9.99536	64	5 26.0
37	9.16306	51	9.16771	52	0.83229	9.99535	63	6 31.2
38	9.16357	52	9.16823	53	0.83177	9.99534	62	7 36.4
39	9.16409	51	9.16876	52	0.83124	9.99533	61	8 41.6
40	9.16460	51	9.16928	53	0.83072	9.99532	60	9 46.8
41	9.16511	52	9.16981	52	0.83019	9.99530	59	51
42	9.16563	51	9.17033	52	0.82967	9.99529	58	1 5.1
43	9.16614	51	9.17085	53	0.82915	9.99528	57	2 10.2
44	9.16665	51	9.17138	52	0.82862	9.99527	56	3 15.3
45	9.16716	51	9.17190	52	0.82810	9.99526	55	4 20.4
46	9.16767	51	9.17242	52	0.82758	9.99525	54	5 25.5
47	9.16818	51	9.17294	52	0.82706	9.99524	53	6 30.6
48	9.16869	50	9.17346	52	0.82654	9.99523	52	7 35.7
49	9.16919	51	9.17398	52	0.82602	9.99521	51	8 40.8
50	9.16970		9.17450		0.82550	9.99520	50	9 45.9
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

8°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.16970	51	9.17450	52	0.82550	9.99520	50	
51	9.17021	51	9.17502	51	0.82498	9.99519	49	52
52	9.17072	50	9.17553	52	0.82447	9.99518	48	1 5.2
53	9.17122	51	9.17605	52	0.82395	9.99517	47	2 10.4
54	9.17173	50	9.17657	51	0.82343	9.99516	46	3 15.6
55	9.17223	50	9.17708	52	0.82292	9.99515	45	4 20.8
56	9.17273	51	9.17760	51	0.82240	9.99514	44	5 26.0
57	9.17324	50	9.17811	52	0.82189	9.99512	43	6 31.2
58	9.17374	50	9.17863	51	0.82137	9.99511	42	7 36.4
59	9.17424	50	9.17914	51	0.82086	9.99510	41	8 41.6
60	9.17474	50	9.17965	52	0.82035	9.99509	40	9 46.8
61	9.17524	51	9.18017	51	0.81983	9.99508	39	
62	9.17575	49	9.18068	51	0.81932	9.99507	38	51
63	9.17624	50	9.18119	51	0.81881	9.99505	37	1 5.1
64	9.17674	50	9.18170	51	0.81830	9.99504	36	2 10.2
65	9.17724	50	9.18221	51	0.81779	9.99503	35	3 15.3
66	9.17774	50	9.18272	51	0.81728	9.99502	34	4 20.4
67	9.17824	49	9.18323	51	0.81677	9.99501	33	5 25.5
68	9.17873	50	9.18374	51	0.81626	9.99500	32	6 30.6
69	9.17923	50	9.18425	50	0.81575	9.99499	31	7 35.7
70	9.17973	49	9.18475	51	0.81525	9.99497	30	8 40.8
71	9.18022	50	9.18526	51	0.81474	9.99496	29	9 45.9
72	9.18072	49	9.18577	50	0.81423	9.99495	28	
73	9.18121	49	9.18627	51	0.81373	9.99494	27	50
74	9.18170	50	9.18678	50	0.81322	9.99493	26	1 5.0
75	9.18220	49	9.18728	50	0.81272	9.99492	25	2 10.0
76	9.18269	49	9.18778	51	0.81222	9.99490	24	3 15.0
77	9.18318	49	9.18829	50	0.81171	9.99489	23	4 20.0
78	9.18367	49	9.18879	50	0.81121	9.99488	22	5 25.0
79	9.18416	49	9.18929	50	0.81071	9.99487	21	6 30.0
80	9.18465	49	9.18979	50	0.81021	9.99486	20	7 35.0
81	9.18514	49	9.19029	51	0.80971	9.99485	19	8 40.0
82	9.18563	49	9.19080	50	0.80920	9.99483	18	9 45.0
83	9.18612	49	9.19130	49	0.80870	9.99482	17	
84	9.18661	48	9.19179	50	0.80821	9.99481	16	49
85	9.18709	49	9.19229	50	0.80771	9.99480	15	1 4.9
86	9.18758	48	9.19279	50	0.80721	9.99479	14	2 9.8
87	9.18806	49	9.19329	50	0.80671	9.99477	13	3 14.7
88	9.18855	49	9.19379	49	0.80621	9.99476	12	4 19.6
89	9.18904	48	9.19428	50	0.80572	9.99475	11	5 24.5
90	9.18952	48	9.19478	50	0.80522	9.99474	10	6 29.4
91	9.19000	49	9.19528	49	0.80472	9.99473	09	7 34.3
92	9.19049	48	9.19577	50	0.80423	9.99472	08	8 39.2
93	9.19097	48	9.19627	49	0.80373	9.99470	07	9 44.1
94	9.19145	48	9.19676	49	0.80324	9.99469	06	
95	9.19193	48	9.19725	50	0.80275	9.99468	05	48
96	9.19241	48	9.19775	49	0.80225	9.99467	04	1 4.8
97	9.19289	48	9.19824	49	0.80176	9.99466	03	2 9.6
98	9.19337	48	9.19873	49	0.80127	9.99464	02	3 14.4
99	9.19385	48	9.19922	49	0.80078	9.99463	01	4 19.2
100	9.19433		9.19971		0.80029	9.99462	00	5 24.0
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
9°								
00	9.19433	48	9.19971	49	0.80029	9.99462	100	
01	9.19481	48	9.20020	49	0.79980	9.99461	99	49
02	9.19529	48	9.20069	49	0.79931	9.99460	98	1 | 4.9
03	9.19577	47	9.20118	49	0.79882	9.99458	97	2 | 9.8
04	9.19624	48	9.20167	49	0.79833	9.99457	96	3 | 14.7
05	9.19672	47	9.20216	49	0.79784	9.99456	95	4 | 19.6
06	9.19719	48	9.20265	48	0.79735	9.99455	94	5 | 24.5
07	9.19767	47	9.20313	49	0.79687	9.99454	93	6 | 29.4
08	9.19814	48	9.20362	49	0.79638	9.99452	92	7 | 34.3
09	9.19862	47	9.20411	48	0.79589	9.99451	91	8 | 39.2
10	9.19909	47	9.20459	49	0.79541	9.99450	90	9 | 44.1
11	9.19956	48	9.20508	48	0.79492	9.99449	89	
12	9.20004	47	9.20556	49	0.79444	9.99447	88	48
13	9.20051	47	9.20605	48	0.79395	9.99446	87	1 | 4.8
14	9.20098	47	9.20653	48	0.79347	9.99445	86	2 | 9.6
15	9.20145	47	9.20701	49	0.79299	9.99444	85	3 | 14.4
16	9.20192	47	9.20750	48	0.79250	9.99443	84	4 | 19.2
17	9.20239	47	9.20798	48	0.79202	9.99441	83	5 | 24.0
18	9.20286	47	9.20846	48	0.79154	9.99440	82	6 | 28.8
19	9.20333	47	9.20894	48	0.79106	9.99439	81	7 | 33.6
20	9.20380	47	9.20942	48	0.79058	9.99438	80	8 | 38.4
21	9.20427	46	9.20990	48	0.79010	9.99436	79	9 | 43.2
22	9.20473	47	9.21038	48	0.78962	9.99435	78	
23	9.20520	47	9.21086	48	0.78914	9.99434	77	47
24	9.20567	46	9.21134	48	0.78866	9.99433	76	1 | 4.7
25	9.20613	47	9.21182	47	0.78818	9.99432	75	2 | 9.4
26	9.20660	46	9.21229	48	0.78771	9.99430	74	3 | 14.1
27	9.20706	46	9.21277	48	0.78723	9.99429	73	4 | 18.8
28	9.20752	47	9.21325	47	0.78675	9.99428	72	5 | 23.5
29	9.20799	46	9.21372	48	0.78628	9.99427	71	6 | 28.2
30	9.20845	46	9.21420	47	0.78580	9.99425	70	7 | 32.9
31	9.20891	47	9.21467	48	0.78533	9.99424	69	8 | 37.6
32	9.20938	46	9.21515	47	0.78485	9.99423	68	9 | 42.3
33	9.20984	46	9.21562	48	0.78438	9.99422	67	
34	9.21030	46	9.21610	47	0.78390	9.99420	66	46
35	9.21076	46	9.21657	47	0.78343	9.99419	65	1 | 4.6
36	9.21122	46	9.21704	47	0.78296	9.99418	64	2 | 9.2
37	9.21168	46	9.21751	47	0.78249	9.99417	63	3 | 13.8
38	9.21214	46	9.21798	48	0.78202	9.99415	62	4 | 18.4
39	9.21260	46	9.21846	47	0.78154	9.99414	61	5 | 23.0
40	9.21306	45	9.21893	47	0.78107	9.99413	60	6 | 27.6
41	9.21351	46	9.21940	47	0.78060	9.99412	59	7 | 32.2
42	9.21397	46	9.21987	47	0.78013	9.99410	58	8 | 36.8
43	9.21443	45	9.22034	46	0.77966	9.99409	57	9 | 41.4
44	9.21488	46	9.22080	47	0.77920	9.99408	56	
45	9.21534	45	9.22127	47	0.77873	9.99407	55	45
46	9.21579	46	9.22174	47	0.77826	9.99405	54	1 | 4.5
47	9.21625	45	9.22221	46	0.77779	9.99404	53	2 | 9.0
48	9.21670	46	9.22267	47	0.77733	9.99403	52	3 | 13.5
49	9.21716	45	9.22314	47	0.77686	9.99402	51	4 | 18.0
50	9.21761		9.22361		0.77639	9.99400	50	5 | 22.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
80°								6 | 27.0
								7 | 31.5
								8 | 36.0
								9 | 40.5

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TABLE LII.—*Common logarithms of circular functions*—Continued

	9°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9. 21761	45	9. 22361	46	0. 77639	9. 99400	50	
51	9. 21806	45	9. 22407	47	0. 77593	9. 99399	49	47
52	9. 21851	46	9. 22454	46	0. 77546	9. 99398	48	1 | 4.7
53	9. 21897	45	9. 22500	47	0. 77500	9. 99396	47	2 | 9.4
54	9. 21942	45	9. 22547	46	0. 77453	9. 99395	46	3 | 14.1
55	9. 21987	45	9. 22593	46	0. 77407	9. 99394	45	4 | 18.8
56	9. 22032	45	9. 22639	46	0. 77361	9. 99393	44	5 | 23.5
57	9. 22077	45	9. 22685	47	0. 77315	9. 99391	43	6 | 28.2
58	9. 22122	45	9. 22732	46	0. 77268	9. 99390	42	7 | 32.9
59	9. 22167	44	9. 22778	46	0. 77222	9. 99389	41	8 | 37.6
60	9. 22211	45	9. 22824	46	0. 77176	9. 99388	40	9 | 42.3
61	9. 22256	45	9. 22870	46	0. 77130	9. 99386	39	46
62	9. 22301	45	9. 22916	46	0. 77084	9. 99385	38	1 | 4.6
63	9. 22346	44	9. 22962	46	0. 77038	9. 99384	37	2 | 9.2
64	9. 22390	45	9. 23008	46	0. 76992	9. 99382	36	3 | 13.8
65	9. 22435	45	9. 23054	46	0. 76946	9. 99381	35	4 | 18.4
66	9. 22480	44	9. 23100	46	0. 76900	9. 99380	34	5 | 23.0
67	9. 22524	44	9. 23146	45	0. 76854	9. 99379	33	6 | 27.6
68	9. 22568	45	9. 23191	46	0. 76809	9. 99377	32	7 | 32.2
69	9. 22613	44	9. 23237	46	0. 76763	9. 99376	31	8 | 36.8
70	9. 22657	45	9. 23283	45	0. 76717	9. 99375	30	9 | 41.4
71	9. 22702	44	9. 23328	46	0. 76672	9. 99373	29	45
72	9. 22746	44	9. 23374	45	0. 76626	9. 99372	28	1 | 4.5
73	9. 22790	44	9. 23419	46	0. 76581	9. 99371	27	2 | 9.0
74	9. 22834	44	9. 23465	45	0. 76535	9. 99369	26	3 | 13.5
75	9. 22878	44	9. 23510	46	0. 76490	9. 99368	25	4 | 18.0
76	9. 22922	45	9. 23556	45	0. 76444	9. 99367	24	5 | 22.5
77	9. 22967	44	9. 23601	45	0. 76399	9. 99366	23	6 | 27.0
78	9. 23011	43	9. 23646	46	0. 76354	9. 99364	22	7 | 31.5
79	9. 23054	44	9. 23692	45	0. 76308	9. 99363	21	8 | 36.0
80	9. 23098	44	9. 23737	45	0. 76263	9. 99362	20	9 | 40.5
81	9. 23142	44	9. 23782	45	0. 76218	9. 99360	19	44
82	9. 23186	44	9. 23827	45	0. 76173	9. 99359	18	1 | 4.4
83	9. 23230	44	9. 23872	45	0. 76128	9. 99358	17	2 | 8.8
84	9. 23274	43	9. 23917	45	0. 76083	9. 99356	16	3 | 13.2
85	9. 23317	44	9. 23962	45	0. 76038	9. 99355	15	4 | 17.6
86	9. 23361	43	9. 24007	45	0. 75993	9. 99354	14	5 | 22.0
87	9. 23404	44	9. 24052	45	0. 75948	9. 99352	13	6 | 26.4
88	9. 23448	43	9. 24097	45	0. 75903	9. 99351	12	7 | 30.8
89	9. 23491	44	9. 24142	44	0. 75858	9. 99350	11	8 | 35.2
90	9. 23535	43	9. 24186	45	0. 75814	9. 99348	10	9 | 39.6
91	9. 23578	44	9. 24231	45	0. 75769	9. 99347	09	43
92	9. 23622	43	9. 24276	45	0. 75724	9. 99346	08	1 | 4.3
93	9. 23665	43	9. 24321	44	0. 75679	9. 99344	07	2 | 8.6
94	9. 23708	44	9. 24365	45	0. 75635	9. 99343	06	3 | 12.9
95	9. 23752	43	9. 24410	44	0. 75590	9. 99342	05	4 | 17.2
96	9. 23795	43	9. 24454	45	0. 75546	9. 99340	04	5 | 21.5
97	9. 23838	43	9. 24499	44	0. 75501	9. 99339	03	6 | 25.8
98	9. 23881	43	9. 24543	45	0. 75457	9. 99338	02	7 | 30.1
99	9. 23924	43	9. 24588	44	0. 75412	9. 99336	01	8 | 34.4
100	9. 23967		9. 24632		0. 75368	9. 99335	00	9 | 38.7
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
	80°							

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
					10°			
00	9.23967	43	9.24632	44	0.75368	9.99335	100	
01	9.24010	43	9.24676	44	0.75324	9.99334	99	
02	9.24053	43	9.24720	45	0.75280	9.99332	98	
03	9.24096	43	9.24765	44	0.75235	9.99331	97	
04	9.24139	42	9.24809	44	0.75191	9.99330	96	44
05	9.24181	43	9.24853	44	0.75147	9.99328	95	1 4.4
06	9.24224	43	9.24897	44	0.75103	9.99327	94	2 8.8
07	9.24267	43	9.24941	44	0.75059	9.99326	93	3 13.2
08	9.24310	42	9.24985	44	0.75015	9.99324	92	4 17.6
09	9.24352	43	9.25029	44	0.74971	9.99323	91	5 22.0
10	9.24395	42	9.25073	44	0.74927	9.99322	90	6 26.4
11	9.24437	43	9.25117	44	0.74883	9.99320	89	7 30.8
12	9.24480	42	9.25161	44	0.74839	9.99319	88	8 35.2
13	9.24522	43	9.25205	43	0.74795	9.99318	87	9 39.6
14	9.24565	42	9.25248	44	0.74752	9.99316	86	
15	9.24607	42	9.25292	44	0.74708	9.99315	85	
16	9.24649	43	9.25336	43	0.74664	9.99314	84	43
17	9.24692	42	9.25379	44	0.74621	9.99312	83	1 4.3
18	9.24734	42	9.25423	43	0.74577	9.99311	82	2 8.6
19	9.24776	42	9.25466	44	0.74534	9.99310	81	3 12.9
20	9.24818	42	9.25510	43	0.74490	9.99308	80	4 17.2
21	9.24860	42	9.25553	44	0.74447	9.99307	79	5 21.5
22	9.24902	42	9.25597	43	0.74403	9.99305	78	6 25.8
23	9.24944	42	9.25640	44	0.74360	9.99304	77	7 30.1
24	9.24986	42	9.25684	43	0.74316	9.99303	76	8 34.4
25	9.25028	42	9.25727	43	0.74273	9.99301	75	9 38.7
26	9.25070	42	9.25770	43	0.74230	9.99300	74	
27	9.25112	42	9.25813	44	0.74187	9.99299	73	
28	9.25154	42	9.25857	43	0.74143	9.99297	72	42
29	9.25196	41	9.25900	43	0.74100	9.99296	71	1 4.2
30	9.25237	42	9.25943	43	0.74057	9.99294	70	2 8.4
31	9.25279	42	9.25986	43	0.74014	9.99293	69	3 12.6
32	9.25321	41	9.26029	43	0.73971	9.99292	68	4 16.8
33	9.25362	42	9.26072	43	0.73928	9.99290	67	5 21.0
34	9.25404	41	9.26115	43	0.73885	9.99289	66	6 25.2
35	9.25445	42	9.26158	43	0.73842	9.99288	65	7 29.4
36	9.25487	41	9.26201	42	0.73799	9.99286	64	8 33.6
37	9.25528	42	9.26243	43	0.73757	9.99285	63	9 37.8
38	9.25570	41	9.26286	43	0.73714	9.99283	62	
39	9.25611	41	9.26329	43	0.73671	9.99282	61	
40	9.25652	42	9.26372	42	0.73628	9.99281	60	41
41	9.25694	41	9.26414	43	0.73586	9.99279	59	1 4.1
42	9.25735	41	9.26457	43	0.73543	9.99278	58	2 8.2
43	9.25776	41	9.26500	42	0.73500	9.99276	57	3 12.3
44	9.25817	41	9.26542	43	0.73458	9.99275	56	4 16.4
45	9.25858	41	9.26585	42	0.73415	9.99274	55	5 20.5
46	9.25899	41	9.26627	43	0.73373	9.99272	54	6 24.6
47	9.25940	41	9.26670	42	0.73330	9.99271	53	7 28.7
48	9.25981	41	9.26712	42	0.73288	9.99269	52	8 32.8
49	9.26022	41	9.26754	43	0.73246	9.99268	51	9 36.9
50	9.26063		9.26797		0.73203	9.99267	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
					79°			

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TABLE LII.—*Common logarithms of circular functions*—Continued

10°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.26063		9.26797		0.73203	9.99267	50	
		41		42				
51	9.26104	41	9.26839	42	0.73161	9.99265	49	
52	9.26145	41	9.26881	42	0.73119	9.99264	48	
53	9.26186	41	9.26923	43	0.73077	9.99262	47	
54	9.26227	40	9.26966	42	0.73034	9.99261	46	43
55	9.26267	41	9.27008	42	0.72992	9.99260	45	1 4.3
56	9.26308	41	9.27050	42	0.72950	9.99258	44	2 8.6
57	9.26349	40	9.27092	42	0.72908	9.99257	43	3 12.9
58	9.26389	41	9.27134	42	0.72866	9.99255	42	4 17.2
59	9.26430	40	9.27176	42	0.72824	9.99254	41	5 21.5
60	9.26470		9.27218		0.72782	9.99252	40	6 25.8
		41		42				7 30.1
61	9.26511	40	9.27260	42	0.72740	9.99251	39	8 34.4
62	9.26551	41	9.27302	41	0.72698	9.99250	38	9 38.7
63	9.26592	40	9.27343	42	0.72657	9.99248	37	
64	9.26632	40	9.27385	42	0.72615	9.99247	36	
65	9.26672	41	9.27427	42	0.72573	9.99245	35	
66	9.26713	40	9.27469	41	0.72531	9.99244	34	42
67	9.26753	40	9.27510	42	0.72490	9.99243	33	1 4.2
68	9.26793	40	9.27552	42	0.72448	9.99241	32	2 8.4
69	9.26833	40	9.27594	41	0.72406	9.99240	31	3 12.6
70	9.26873		9.27635		0.72365	9.99238	30	4 16.8
		40		42				5 21.0
71	9.26913	41	9.27677	41	0.72323	9.99237	29	6 25.2
72	9.26954	40	9.27718	42	0.72282	9.99236	28	7 29.4
73	9.26994	40	9.27760	41	0.72240	9.99234	27	8 33.6
74	9.27034	39	9.27801	41	0.72199	9.99233	26	9 37.8
75	9.27073	40	9.27842	42	0.72158	9.99231	25	
76	9.27113	40	9.27884	41	0.72116	9.99230	24	
77	9.27153	40	9.27925	41	0.72075	9.99228	23	
78	9.27193	40	9.27966	42	0.72034	9.99227	22	41
79	9.27233	40	9.28008	41	0.71992	9.99225	21	1 4.1
80	9.27273		9.28049		0.71951	9.99224	20	2 8.2
		39		41				3 12.3
81	9.27312	40	9.28090	41	0.71910	9.99222	19	4 16.4
82	9.27352	40	9.28131	41	0.71869	9.99221	18	5 20.5
83	9.27392	39	9.28172	41	0.71828	9.99220	17	6 24.6
84	9.27431	40	9.28213	41	0.71787	9.99218	16	7 28.7
85	9.27471	39	9.28254	41	0.71746	9.99217	15	8 32.8
86	9.27510	40	9.28295	41	0.71705	9.99215	14	9 36.9
87	9.27550	39	9.28336	41	0.71664	9.99214	13	
88	9.27589	40	9.28377	41	0.71623	9.99212	12	
89	9.27629	39	9.28418	41	0.71582	9.99211	11	
90	9.27668		9.28459		0.71541	9.99209	10	40
		39		41				1 4.0
91	9.27707	40	9.28500	40	0.71500	9.99208	09	2 8.0
92	9.27747	39	9.28540	41	0.71460	9.99206	08	3 12.0
93	9.27786	39	9.28581	41	0.71419	9.99205	07	4 16.0
94	9.27825	39	9.28622	40	0.71378	9.99203	06	5 20.0
95	9.27864	40	9.28662	41	0.71338	9.99202	05	6 24.0
96	9.27904	39	9.28703	41	0.71297	9.99201	04	7 28.0
97	9.27943	39	9.28744	40	0.71256	9.99199	03	8 32.0
98	9.27982	39	9.28784	41	0.71216	9.99198	02	9 36.0
99	9.28021	39	9.28825	40	0.71175	9.99196	01	
100	9.28060		9.28865		0.71135	9.99195	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

79°

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
					11°			
00	9.28060	39	9.28865	41	0.71135	9.99195	100	
01	9.28099	39	9.28906	40	0.71094	9.99193	99	
02	9.28138	39	9.28946	40	0.71054	9.99192	98	
03	9.28177	39	9.28986	41	0.71014	9.99190	97	
04	9.28216	38	9.29027	40	0.70973	9.99189	96	41 1 | 4.1
05	9.28254	39	9.29067	40	0.70933	9.99187	95	2 | 8.2
06	9.28293	39	9.29107	41	0.70893	9.99186	94	3 | 12.3
07	9.28332	39	9.29148	40	0.70852	9.99184	93	4 | 16.4
08	9.28371	38	9.29188	40	0.70812	9.99183	92	5 | 20.5
09	9.28409	39	9.29228	40	0.70772	9.99181	91	6 | 24.6
10	9.28448	39	9.29268	40	0.70732	9.99180	90	7 | 28.7 8 | 32.8 9 | 36.9
11	9.28487	38	9.29308	40	0.70692	9.99178	89	
12	9.28525	39	9.29348	40	0.70652	9.99177	88	
13	9.28564	38	9.29388	40	0.70612	9.99175	87	
14	9.28602	39	9.29428	40	0.70572	9.99174	86	
15	9.28641	38	9.29468	40	0.70532	9.99172	85	40
16	9.28679	39	9.29508	40	0.70492	9.99171	84	1 | 4.0 2 | 8.0
17	9.28718	38	9.29548	40	0.70452	9.99169	83	3 | 12.0
18	9.28756	38	9.29588	40	0.70412	9.99168	82	4 | 16.0
19	9.28794	39	9.29628	40	0.70372	9.99166	81	5 | 20.0 6 | 24.0
20	9.28833	38	9.29668	39	0.70332	9.99165	80	7 | 28.0 8 | 32.0
21	9.28871	38	9.29707	40	0.70293	9.99163	79	9 | 36.0
22	9.28909	38	9.29747	40	0.70253	9.99162	78	
23	9.28947	38	9.29787	40	0.70213	9.99160	77	
24	9.28985	39	9.29827	39	0.70173	9.99159	76	
25	9.29024	38	9.29866	40	0.70134	9.99157	75	
26	9.29062	38	9.29906	39	0.70094	9.99156	74	39
27	9.29100	38	9.29945	40	0.70055	9.99154	73	1 | 3.9
28	9.29138	38	9.29985	39	0.70015	9.99153	72	2 | 7.8
29	9.29176	38	9.30024	40	0.69976	9.99151	71	3 | 11.7 4 | 15.6
30	9.29214	38	9.30064	39	0.69936	9.99150	70	5 | 19.5 6 | 23.4
31	9.29252	37	9.30103	40	0.69897	9.99148	69	7 | 27.3
32	9.29289	38	9.30143	39	0.69857	9.99147	68	8 | 31.2
33	9.29327	38	9.30182	39	0.69818	9.99145	67	9 | 35.1
34	9.29365	38	9.30221	40	0.69779	9.99144	66	
35	9.29403	38	9.30261	39	0.69739	9.99142	65	
36	9.29441	37	9.30300	39	0.69700	9.99141	64	
37	9.29478	38	9.30339	39	0.69661	9.99139	63	
38	9.29516	38	9.30378	40	0.69622	9.99138	62	
39	9.29554	37	9.30418	39	0.69582	9.99136	61	38
40	9.29591	38	9.30457	39	0.69543	9.99135	60	1 | 3.8 2 | 7.6
41	9.29629	37	9.30496	39	0.69504	9.99133	59	3 | 11.4
42	9.29666	38	9.30535	39	0.69465	9.99132	58	4 | 15.2
43	9.29704	37	9.30574	39	0.69426	9.99130	57	5 | 19.0 6 | 22.8
44	9.29741	38	9.30613	39	0.69387	9.99128	56	7 | 26.6
45	9.29779	37	9.30652	39	0.69348	9.99127	55	8 | 30.4
46	9.29816	38	9.30691	39	0.69309	9.99125	54	9 | 34.2
47	9.29854	37	9.30730	39	0.69270	9.99124	53	
48	9.29891	37	9.30769	38	0.69231	9.99122	52	
49	9.29928	38	9.30807	39	0.69193	9.99121	51	
50	9.29966		9.30846		0.69154	9.99119	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
					78°			

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TABLE LII.—*Common logarithms of circular functions*—Continued

11°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.29966	37	9.30846	39	0.69154	9.99119	50	
51	9.30033	37	9.30885	39	0.69115	9.99118	49	
52	9.30040	37	9.30924	39	0.69076	9.99116	48	
53	9.30077	37	9.30963	38	0.69037	9.99115	47	
54	9.30114	37	9.31001	39	0.68999	9.99113	46	38
55	9.30151	37	9.31040	38	0.68960	9.99112	45	1 3.8
56	9.30188	38	9.31078	39	0.68922	9.99110	44	2 7.6
57	9.30226	37	9.31117	39	0.68883	9.99108	43	3 11.4
58	9.30263	36	9.31156	38	0.68844	9.99107	42	4 15.2
59	9.30299	37	9.31194	39	0.68806	9.99105	41	5 19.0
60	9.30336	37	9.31233	38	0.68767	9.99104	40	6 22.8
61	9.30373	37	9.31271	39	0.68729	9.99102	39	7 26.6
62	9.30410	37	9.31310	38	0.68690	9.99101	38	8 30.4
63	9.30447	37	9.31348	38	0.68652	9.99099	37	9 34.2
64	9.30484	37	9.31386	39	0.68614	9.99098	36	
65	9.30521	36	9.31425	38	0.68575	9.99096	35	37
66	9.30557	37	9.31463	38	0.68537	9.99094	34	1 3.7
67	9.30594	37	9.31501	39	0.68499	9.99093	33	2 7.4
68	9.30631	36	9.31540	38	0.68460	9.99091	32	3 11.1
69	9.30667	37	9.31578	38	0.68422	9.99090	31	4 14.8
70	9.30704	37	9.31616	38	0.68384	9.99088	30	5 18.5
71	9.30741	36	9.31654	38	0.68346	9.99087	29	6 22.2
72	9.30777	37	9.31692	38	0.68308	9.99085	28	7 25.9
73	9.30814	36	9.31730	38	0.68270	9.99083	27	8 29.6
74	9.30850	37	9.31768	38	0.68232	9.99082	26	9 33.3
75	9.30887	36	9.31806	38	0.68194	9.99080	25	
76	9.30923	37	9.31844	38	0.68156	9.99079	24	
77	9.30960	36	9.31882	38	0.68118	9.99077	23	36
78	9.30996	36	9.31920	38	0.68080	9.99076	22	1 3.6
79	9.31032	36	9.31958	38	0.68042	9.99074	21	2 7.2
80	9.31068	37	9.31996	38	0.68004	9.99072	20	3 10.8
81	9.31105	36	9.32034	38	0.67966	9.99071	19	4 14.4
82	9.31141	36	9.32072	38	0.67928	9.99069	18	5 18.0
83	9.31177	36	9.32110	37	0.67890	9.99068	17	6 21.6
84	9.31213	37	9.32147	38	0.67853	9.99066	16	7 25.2
85	9.31250	36	9.32185	38	0.67815	9.99064	15	8 28.8
86	9.31286	36	9.32223	37	0.67777	9.99063	14	9 32.4
87	9.31322	36	9.32260	38	0.67740	9.99061	13	
88	9.31358	36	9.32298	38	0.67702	9.99060	12	
89	9.31394	36	9.32336	37	0.67664	9.99058	11	35
90	9.31430	36	9.32373	38	0.67627	9.99056	10	1 3.5
91	9.31466	36	9.32411	37	0.67589	9.99055	09	2 7.0
92	9.31502	36	9.32448	38	0.67552	9.99053	08	3 10.5
93	9.31538	35	9.32486	37	0.67514	9.99052	07	4 14.0
94	9.31573	36	9.32523	38	0.67477	9.99050	06	5 17.5
95	9.31609	36	9.32561	37	0.67439	9.99048	05	6 21.0
96	9.31645	36	9.32598	38	0.67402	9.99047	04	7 24.5
97	9.31681	36	9.32636	37	0.67364	9.99045	03	8 28.0
98	9.31717	35	9.32673	37	0.67327	9.99044	02	9 31.5
99	9.31752	36	9.32710	37	0.67290	9.99042	01	
100	9.31788		9.32747		0.67253	9.99040	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

78°

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TABLE LII.—*Common logarithms of circular functions*—Continued

	12°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.31788	36	9.32747	38	0.67253	9.99040	100	
01	9.31824	35	9.32785	37	0.67215	9.99039	99	
02	9.31859	36	9.32822	37	0.67178	9.99037	98	
03	9.31895	35	9.32859	37	0.67141	9.99036	97	
04	9.31930	36	9.32896	37	0.67104	9.99034	96	38
05	9.31966	35	9.32933	38	0.67067	9.99032	95	1 | 3.8
06	9.32001	36	9.32971	37	0.67029	9.99031	94	2 | 7.6
07	9.32037	35	9.33008	37	0.66992	9.99029	93	3 | 11.4
08	9.32072	36	9.33045	37	0.66955	9.99028	92	4 | 15.2
09	9.32108	35	9.33082	37	0.66918	9.99026	91	5 | 19.0
10	9.32143	35	9.33119	37	0.66881	9.99024	90	6 | 22.8
11	9.32178	36	9.33156	37	0.66844	9.99023	89	7 | 26.6
12	9.32214	35	9.33193	37	0.66807	9.99021	88	8 | 30.4
13	9.32249	35	9.33230	36	0.66770	9.99019	87	9 | 34.2
14	9.32284	35	9.33266	37	0.66734	9.99018	86	
15	9.32319	36	9.33303	37	0.66697	9.99016	85	37
16	9.32355	35	9.33340	37	0.66660	9.99014	84	
17	9.32390	35	9.33377	37	0.66623	9.99013	83	1 | 3.7
18	9.32425	35	9.33414	36	0.66586	9.99011	82	2 | 7.4
19	9.32460	35	9.33450	37	0.66550	9.99010	81	3 | 11.1
20	9.32495	35	9.33487	37	0.66513	9.99008	80	4 | 14.8
21	9.32530	35	9.33524	36	0.66476	9.99006	79	5 | 18.5
22	9.32565	35	9.33560	37	0.66440	9.99005	78	6 | 22.2
23	9.32600	35	9.33597	37	0.66403	9.99003	77	7 | 25.9
24	9.32635	35	9.33634	36	0.66366	9.99001	76	8 | 29.6
25	9.32670	35	9.33670	37	0.66330	9.99000	75	9 | 33.3
26	9.32705	35	9.33707	36	0.66293	9.98998	74	
27	9.32740	35	9.33743	37	0.66257	9.98996	73	36
28	9.32775	34	9.33780	36	0.66220	9.98995	72	1 | 3.6
29	9.32809	35	9.33816	37	0.66184	9.98993	71	2 | 7.2
30	9.32844	35	9.33853	36	0.66147	9.98991	70	3 | 10.8
31	9.32879	35	9.33889	36	0.66111	9.98990	69	4 | 14.4
32	9.32914	34	9.33925	37	0.66075	9.98988	68	5 | 18.0
33	9.32948	35	9.33962	36	0.66038	9.98987	67	6 | 21.6
34	9.32983	35	9.33998	36	0.66002	9.98985	66	7 | 25.2
35	9.33018	34	9.34034	37	0.65966	9.98983	65	8 | 28.8
36	9.33052	35	9.34071	36	0.65929	9.98982	64	9 | 32.4
37	9.33087	34	9.34107	36	0.65893	9.98980	63	
38	9.33121	35	9.34143	36	0.65857	9.98978	62	
39	9.33156	34	9.34179	36	0.65821	9.98977	61	35
40	9.33190	35	9.34215	37	0.65785	9.98975	60	1 | 3.5
41	9.33225	34	9.34252	36	0.65748	9.98973	59	2 | 7.0
42	9.33259	35	9.34288	36	0.65712	9.98972	58	3 | 10.5
43	9.33294	34	9.34324	36	0.65676	9.98970	57	4 | 14.0
44	9.33328	34	9.34360	36	0.65640	9.98968	56	5 | 17.5
45	9.33362	35	9.34396	36	0.65604	9.98967	55	6 | 21.0
46	9.33397	34	9.34432	36	0.65568	9.98965	54	7 | 24.5
47	9.33431	34	9.34468	36	0.65532	9.98963	53	8 | 28.0
48	9.33465	34	9.34504	36	0.65496	9.98962	52	9 | 31.5
49	9.33499	35	9.34540	36	0.65460	9.98960	51	
50	9.33534		9.34576		0.65424	9.98958	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
	77°							

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TABLE LII.—*Common logarithms of circular functions*—Continued

12°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	
50	9.33534	34	9.34576	35	0.65424	9.98958	50
51	9.33568	34	9.34611	36	0.65389	9.98956	49
52	9.33602	34	9.34647	36	0.65353	9.98955	48
53	9.33636	34	9.34683	36	0.65317	9.98953	47
54	9.33670	34	9.34719	36	0.65281	9.98951	46
55	9.33704	34	9.34755	35	0.65245	9.98950	45
56	9.33738	34	9.34790	36	0.65210	9.98948	44
57	9.33772	34	9.34826	36	0.65174	9.98946	43
58	9.33806	34	9.34862	35	0.65138	9.98945	42
59	9.33840	34	9.34897	36	0.65103	9.98943	41
60	9.33874	34	9.34933	35	0.65067	9.98941	40
61	9.33908	34	9.34968	36	0.65032	9.98940	39
62	9.33942	34	9.35004	36	0.64996	9.98938	38
63	9.33976	34	9.35040	35	0.64960	9.98936	37
64	9.34010	33	9.35075	36	0.64925	9.98934	36
65	9.34043	34	9.35111	35	0.64889	9.98933	35
66	9.34077	34	9.35146	35	0.64854	9.98931	34
67	9.34111	34	9.35181	36	0.64819	9.98929	33
68	9.34145	33	9.35217	35	0.64783	9.98928	32
69	9.34178	34	9.35252	36	0.64748	9.98926	31
70	9.34212	34	9.35288	35	0.64712	9.98924	30
71	9.34246	33	9.35323	35	0.64677	9.98923	29
72	9.34279	34	9.35358	36	0.64642	9.98921	28
73	9.34313	33	9.35394	35	0.64606	9.98919	27
74	9.34346	34	9.35429	35	0.64571	9.98917	26
75	9.34380	33	9.35464	35	0.64536	9.98916	25
76	9.34413	34	9.35499	35	0.64501	9.98914	24
77	9.34447	33	9.35534	36	0.64466	9.98912	23
78	9.34480	34	9.35570	35	0.64430	9.98911	22
79	9.34514	33	9.35605	35	0.64395	9.98909	21
80	9.34547	33	9.35640	35	0.64360	9.98907	20
81	9.34580	34	9.35675	35	0.64325	9.98905	19
82	9.34614	33	9.35710	35	0.64290	9.98904	18
83	9.34647	33	9.35745	35	0.64255	9.98902	17
84	9.34680	33	9.35780	35	0.64220	9.98900	16
85	9.34713	34	9.35815	35	0.64185	9.98898	15
86	9.34747	33	9.35850	35	0.64150	0.98897	14
87	9.34780	33	9.35885	35	0.64115	9.98895	13
88	9.34813	33	9.35920	35	0.64080	9.98893	12
89	9.34846	33	9.35955	34	0.64045	9.98892	11
90	9.34879	33	9.35989	35	0.64011	9.98890	10
91	9.34912	33	9.36024	35	0.63976	9.98888	09
92	9.34945	33	9.36059	35	0.63941	9.98886	08
93	9.34978	33	9.36094	34	0.63906	9.98885	07
94	9.35011	33	9.36128	35	0.63872	9.98883	06
95	9.35044	33	9.36163	35	0.63837	9.98881	05
96	9.35077	33	9.36198	35	0.63802	9.98879	04
97	9.35110	33	9.36233	34	0.63767	9.98878	03
98	9.35143	33	9.36267	35	0.63733	9.98876	02
99	9.35176	33	9.36302	34	0.63698	9.98874	01
100	9.35209		9.36336		0.63664	9.98872	00
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	
77°							

Prop. Pts.	
	36
1	3.6
2	7.2
3	10.8
4	14.4
5	18.0
6	21.6
7	25.2
8	28.8
9	32.4
	35
1	3.5
2	7.0
3	10.5
4	14.0
5	17.5
6	21.0
7	24.5
8	28.0
9	31.5
	34
1	3.4
2	6.8
3	10.2
4	13.6
5	17.0
6	20.4
7	23.8
8	27.2
9	30.6
	33
1	3.3
2	6.6
3	9.9
4	13.2
5	16.5
6	19.8
7	23.1
8	26.4
9	29.7

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TABLE LII.—*Common logarithms of circular functions*—Continued

13°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.35209	33	9.36336	35	0.63664	9.98872	100	
01	9.35242	32	9.36371	35	0.63629	9.98871	99	
02	9.35274	33	9.36406	34	0.63594	9.98869	98	
03	9.35307	33	9.36440	35	0.63560	9.98867	97	
								35
04	9.35340	33	9.36475	34	0.63525	9.98865	96	1 | 3.5
05	9.35373	32	9.36509	34	0.63491	9.98864	95	2 | 7.0
06	9.35405	33	9.36543	35	0.63457	9.98862	94	3 | 10.5
								4 | 14.0
07	9.35438	33	9.36578	34	0.63422	9.98860	93	5 | 17.5
08	9.35471	32	9.36612	35	0.63388	9.98858	92	6 | 21.0
09	9.35503	33	9.36647	34	0.63353	9.98857	91	7 | 24.5
								8 | 28.0
10	9.35536	32	9.36681	34	0.63319	9.98855	90	9 | 31.5
11	9.35568	33	9.36715	35	0.63285	9.98853	89	
12	9.35601	32	9.36750	34	0.63250	9.98851	88	
13	9.35633	33	9.36784	34	0.63216	9.98850	87	
14	9.35666	32	9.36818	34	0.63182	9.98848	86	
15	9.35698	33	9.36852	35	0.63148	9.98846	85	34
16	9.35731	32	9.36887	34	0.63113	9.98844	84	1 | 3.4
								2 | 6.8
17	9.35763	33	9.36921	34	0.63079	9.98842	83	3 | 10.2
18	9.35796	32	9.36955	34	0.63045	9.98841	82	4 | 13.6
19	9.35828	32	9.36989	34	0.63011	9.98839	81	5 | 17.0
								6 | 20.4
20	9.35860	33	9.37023	34	0.62977	9.98837	80	7 | 23.8
								8 | 27.2
21	9.35893	32	9.37057	34	0.62943	9.98835	79	9 | 30.6
22	9.35925	32	9.37091	34	0.62909	9.98834	78	
23	9.35957	32	9.37125	34	0.62875	9.98832	77	
24	9.35989	33	9.37159	34	0.62841	9.98830	76	
25	9.36022	32	9.37193	34	0.62807	9.98828	75	
26	9.36054	32	9.37227	34	0.62773	9.98826	74	
								33
27	9.36086	32	9.37261	34	0.62739	9.98825	73	1 | 3.3
28	9.36118	32	9.37295	34	0.62705	9.98823	72	2 | 6.6
29	9.36150	32	9.37329	34	0.62671	9.98821	71	3 | 9.9
								4 | 13.2
30	9.36182	32	9.37363	34	0.62637	9.98819	70	5 | 16.5
								6 | 19.8
31	9.36214	32	9.37397	34	0.62603	9.98817	69	7 | 23.1
32	9.36246	32	9.37431	33	0.62569	9.98816	68	8 | 26.4
33	9.36278	32	9.37464	34	0.62536	9.98814	67	9 | 29.7
34	9.36310	32	9.37498	34	0.62502	9.98812	66	
35	9.36342	32	9.37532	34	0.62468	9.98810	65	
36	9.36374	32	9.37566	33	0.62434	9.98808	64	
37	9.36406	32	9.37599	34	0.62401	9.98807	63	
38	9.36438	32	9.37633	34	0.62367	9.98805	62	32
39	9.36470	32	9.37667	33	0.62333	9.98803	61	1 | 3.2
								2 | 6.4
40	9.36502	31	9.37700	34	0.62300	9.98801	60	3 | 9.6
								4 | 12.8
41	9.36533	32	9.37734	34	0.62266	9.98799	59	5 | 16.0
42	9.36565	32	9.37768	33	0.62232	9.98798	58	6 | 19.2
43	9.36597	32	9.37801	34	0.62199	9.98796	57	7 | 22.4
								8 | 25.6
44	9.36629	31	9.37835	33	0.62165	9.98794	56	9 | 28.8
45	9.36660	32	9.37868	34	0.62132	9.98792	55	
46	9.36692	32	9.37902	33	0.62098	9.98790	54	
47	9.36724	31	9.37935	34	0.62065	9.98789	53	
48	9.36755	32	9.37969	33	0.62031	9.98787	52	
49	9.36787	32	9.38002	33	0.61998	9.98785	51	
50	9.36819		9.38035		0.61965	9.98783	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
76°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

13°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.36819		9.38035		0.61965	9.98783	50	
		31		34				
51	9.36850		9.38069		0.61931	9.98781	49	
52	9.36882	32	9.38102	33	0.61898	9.98780	48	
53	9.36913	31	9.38135	33	0.61865	9.98778	47	
		32		34				33
54	9.36945		9.38169		0.61831	9.98776	46	
55	9.36976	31	9.38202	33	0.61798	9.98774	45	1 | 3.3
56	9.37008	32	9.38235	33	0.61765	9.98772	44	2 | 6.6
		31		34				3 | 9.9
57	9.37039		9.38269		0.61731	9.98770	43	4 | 13.2
58	9.37070	31	9.38302	33	0.61698	9.98769	42	5 | 16.5
59	9.37102	32	9.38335	33	0.61665	9.98767	41	6 | 19.8
		31		33				7 | 23.1
60	9.37133		9.38368		0.61632	9.98765	40	8 | 26.4
		31		33				9 | 29.7
61	9.37164		9.38401		0.61599	9.98763	39	
62	9.37196	32	9.38434	33	0.61566	9.98761	38	
63	9.37227	31	9.38468	34	0.61532	9.98759	37	
		31		33				
64	9.37258		9.38501		0.61499	9.98758	36	
65	9.37289	31	9.38534	33	0.61466	9.98756	35	
66	9.37321	32	9.38567	33	0.61433	9.98754	34	
		31		33				32
67	9.37352		9.38600		0.61400	9.98752	33	
68	9.37383	31	9.38633	33	0.61367	9.98750	32	1 | 3.2
69	9.37414	31	9.38666	33	0.61334	9.98748	31	2 | 6.4
		31		33				3 | 9.6
70	9.37445		9.38699		0.61301	9.98746	30	4 | 12.8
		31		33				5 | 16.0
71	9.37476		9.38732		0.61268	9.98745	29	6 | 19.2
72	9.37507	31	9.38765	33	0.61235	9.98743	28	7 | 22.4
73	9.37538	31	9.38797	32	0.61203	9.98741	27	8 | 25.6
		31		33				9 | 28.8
74	9.37569		9.38830		0.61170	9.98739	26	
75	9.37600	31	9.38863	33	0.61137	9.98737	25	
76	9.37631	31	9.38896	33	0.61104	9.98735	24	
		31		33				
77	9.37662		9.38929		0.61071	9.98734	23	31
78	9.37693	31	9.38962	33	0.61038	9.98732	22	
79	9.37724	31	9.38994	32	0.61006	9.98730	21	1 | 3.1
		31		33				2 | 6.2
80	9.37755		9.39027		0.60973	9.98728	20	3 | 9.3
		31		33				4 | 12.4
81	9.37786		9.39060		0.60940	9.98726	19	5 | 15.5
82	9.37817	31	9.39092	32	0.60908	9.98724	18	6 | 18.6
83	9.37847	30	9.39125	33	0.60875	9.98722	17	7 | 21.7
		31		33				8 | 24.8
84	9.37878		9.39158		0.60842	9.98720	16	9 | 27.9
85	9.37909	31	9.39190	32	0.60810	9.98719	15	
86	9.37940	31	9.39223	33	0.60777	9.98717	14	
		30		33				
87	9.37970		9.39256		0.60744	9.98715	13	
88	9.38001	31	9.39288	32	0.60712	9.98713	12	
89	9.38032	31	9.39321	33	0.60679	9.98711	11	30
		30		32				
90	9.38062		9.39353		0.60647	9.98709	10	1 | 3.0
		31		33				2 | 6.0
91	9.38093		9.39386		0.60614	9.98707	09	3 | 9.0
92	9.38124	31	9.39418	32	0.60582	9.98705	08	4 | 12.0
93	9.38154	30	9.39451	33	0.60549	9.98704	07	5 | 15.0
		31		32				6 | 18.0
94	9.38185		9.39483		0.60517	9.98702	06	7 | 21.0
95	9.38215	30	9.39515	32	0.60485	9.98700	05	8 | 24.0
96	9.38246	31	9.39548	33	0.60452	9.98698	04	9 | 27.0
		30		32				
97	9.38276		9.39580		0.60420	9.98696	03	
98	9.38307	31	9.39612	32	0.60388	9.98694	02	
99	9.38337	30	9.39645	33	0.60355	9.98692	01	
		31		32				
100	9.38368		9.39677		0.60323	9.98690	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

76°

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TABLE LII.—*Common logarithms of circular functions*—Continued

14°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	
00	9.38368	30	9.39677	32	0.60323	9.98690	100
01	9.38398	30	9.39709	33	0.60291	9.98689	99
02	9.38428	31	9.39742	32	0.60258	9.98687	98
03	9.38459	30	9.39774	32	0.60226	9.98685	97
04	9.38489	30	9.39806	32	0.60194	9.98683	96
05	9.38519	31	9.39838	32	0.60162	9.98681	95
06	9.38550	30	9.39870	33	0.60130	9.98679	94
07	9.38580	30	9.39903	32	0.60097	9.98677	93
08	9.38610	30	9.39935	32	0.60065	9.98675	92
09	9.38640	30	9.39967	32	0.60033	9.98673	91
10	9.38670	31	9.39999	32	0.60001	9.98671	90
11	9.38701	30	9.40031	32	0.59969	9.98670	89
12	9.38731	30	9.40063	32	0.59937	9.98668	88
13	9.38761	30	9.40095	32	0.59905	9.98666	87
14	9.38791	30	9.40127	32	0.59873	9.98664	86
15	9.38821	30	9.40159	32	0.59841	9.98662	85
16	9.38851	30	9.40191	32	0.59809	9.98660	84
17	9.38881	30	9.40223	32	0.59777	9.98658	83
18	9.38911	30	9.40255	32	0.59745	9.98656	82
19	9.38941	30	9.40287	32	0.59713	9.98654	81
20	9.38971	30	9.40319	32	0.59681	9.98652	80
21	9.39001	30	9.40351	31	0.59649	9.98650	79
22	9.39031	30	9.40382	32	0.59618	9.98648	78
23	9.39061	30	9.40414	32	0.59586	9.98647	77
24	9.39091	30	9.40446	32	0.59554	9.98645	76
25	9.39121	29	9.40478	32	0.59522	9.98643	75
26	9.39150	30	9.40510	31	0.59490	9.98641	74
27	9.39180	30	9.40541	32	0.59459	9.98639	73
28	9.39210	30	9.40573	32	0.59427	9.98637	72
29	9.39240	30	9.40605	31	0.59395	9.98635	71
30	9.39270	29	9.40636	32	0.59364	9.98633	70
31	9.39299	30	9.40668	32	0.59332	9.98631	69
32	9.39329	30	9.40700	31	0.59300	9.98629	68
33	9.39359	29	9.40731	32	0.59269	9.98627	67
34	9.39388	30	9.40763	32	0.59237	9.98625	66
35	9.39418	30	9.40795	31	0.59205	9.98623	65
36	9.39448	29	9.40826	32	0.59174	9.98621	64
37	9.39477	30	9.40858	31	0.59142	9.98620	63
38	9.39507	29	9.40889	32	0.59111	9.98618	62
39	9.39536	30	9.40921	31	0.59079	9.98616	61
40	9.39566	29	9.40952	32	0.59048	9.98614	60
41	9.39595	30	9.40984	31	0.59016	9.98612	59
42	9.39625	29	9.41015	31	0.58985	9.98610	58
43	9.39654	30	9.41046	32	0.58954	9.98608	57
44	9.39684	29	9.41078	31	0.58922	9.98606	56
45	9.39713	30	9.41109	32	0.58891	9.98604	55
46	9.39743	29	9.41141	31	0.58859	9.98602	54
47	9.39772	29	9.41172	31	0.58828	9.98600	53
48	9.39801	30	9.41203	32	0.58797	9.98598	52
49	9.39831	29	9.41235	31	0.58765	9.98596	51
50	9.39860		9.41266		0.58734	9.98594	50
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	
75°							

Prop. Pts.	
	33
1	3.3
2	6.6
3	9.9
4	13.2
5	16.5
6	19.8
7	23.1
8	26.4
9	29.7
	32
1	3.2
2	6.4
3	9.6
4	12.8
5	16.0
6	19.2
7	22.4
8	25.6
9	28.8
	31
1	3.1
2	6.2
3	9.3
4	12.4
5	15.5
6	18.6
7	21.7
8	24.8
9	27.9
	30
1	3.0
2	6.0
3	9.0
4	12.0
5	15.0
6	18.0
7	21.0
8	24.0
9	27.0

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TABLE LII.—*Common logarithms of circular functions*—Continued

14°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.39860	29	9.41266	31	0.58734	9.98594	50	
51	9.39889	30	9.41297	31	0.58703	9.98592	49	
52	9.39919	29	9.41328	32	0.58672	9.98590	48	
53	9.39948	29	9.41360	31	0.58640	9.98588	47	
54	9.39977	29	9.41391	31	0.58609	9.98586	46	31
55	9.40006	29	9.41422	31	0.58578	9.98584	45	1 3.1
56	9.40035	30	9.41453	31	0.58547	9.98582	44	2 6.2
57	9.40065	29	9.41484	31	0.58516	9.98580	43	3 9.3
58	9.40094	29	9.41515	31	0.58485	9.98578	42	4 12.4
59	9.40123	29	9.41546	32	0.58454	9.98576	41	5 15.5
60	9.40152	29	9.41578	31	0.58422	9.98574	40	6 18.6
61	9.40181	29	9.41609	31	0.58391	9.98573	39	7 21.7
62	9.40210	29	9.41640	31	0.58360	9.98571	38	8 24.8
63	9.40239	29	9.41671	31	0.58329	9.98569	37	9 27.9
64	9.40268	29	9.41702	31	0.58298	9.98567	36	
65	9.40297	29	9.41733	31	0.58267	9.98565	35	30
66	9.40326	29	9.41764	31	0.58236	9.98563	34	1 3.0
67	9.40355	29	9.41795	30	0.58205	9.98561	33	2 6.0
68	9.40384	29	9.41825	31	0.58175	9.98559	32	3 9.0
69	9.40413	29	9.41856	31	0.58144	9.98557	31	4 12.0
70	9.40442	29	9.41887	31	0.58113	9.98555	30	5 15.0
71	9.40471	29	9.41918	31	0.58082	9.98553	29	6 18.0
72	9.40500	29	9.41949	31	0.58051	9.98551	28	7 21.0
73	9.40529	28	9.41980	31	0.58020	9.98549	27	8 24.0
74	9.40557	29	9.42011	30	0.57989	9.98547	26	9 27.0
75	9.40586	29	9.42041	31	0.57959	9.98545	25	
76	9.40615	29	9.42072	31	0.57928	9.98543	24	
77	9.40644	28	9.42103	31	0.57897	9.98541	23	29
78	9.40672	29	9.42134	30	0.57866	9.98539	22	1 2.9
79	9.40701	29	9.42164	31	0.57836	9.98537	21	2 5.8
80	9.40730	29	9.42195	31	0.57805	9.98535	20	3 8.7
81	9.40759	28	9.42226	30	0.57774	9.98533	19	4 11.6
82	9.40787	29	9.42256	31	0.57744	9.98531	18	5 14.5
83	9.40816	28	9.42287	31	0.57713	9.98529	17	6 17.4
84	9.40844	29	9.42318	30	0.57682	9.98527	16	7 20.3
85	9.40873	29	9.42348	31	0.57652	9.98525	15	8 23.2
86	9.40902	28	9.42379	31	0.57621	9.98523	14	9 26.1
87	9.40930	29	9.42410	30	0.57590	9.98521	13	
88	9.40959	28	9.42440	31	0.57560	9.98519	12	28
89	9.40987	29	9.42471	30	0.57529	9.98517	11	1 2.8
90	9.41016	28	9.42501	31	0.57499	9.98515	10	2 5.6
91	9.41044	29	9.42532	30	0.57468	9.98513	09	3 8.4
92	9.41073	28	9.42562	31	0.57438	9.98511	08	4 11.2
93	9.41101	29	9.42593	30	0.57407	9.98509	07	5 14.0
94	9.41130	28	9.42623	30	0.57377	9.98507	06	6 16.8
95	9.41158	28	9.42653	31	0.57347	9.98505	05	7 19.6
96	9.41186	29	9.42684	30	0.57316	9.98502	04	8 22.4
97	9.41215	28	9.42714	31	0.57286	9.98500	03	9 25.2
98	9.41243	28	9.42745	30	0.57255	9.98498	02	
99	9.41271	29	9.42775	30	0.57225	9.98496	01	
100	9.41300		9.42805		0.57195	9.98494	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
75°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

15°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.41300	28	9.42805	31	0.57195	9.98494	100	
01	9.41328	28	9.42836	30	0.57164	9.98492	99	
02	9.41356	28	9.42866	30	0.57134	9.98490	98	
03	9.41384	29	9.42896	30	0.57104	9.98488	97	31
04	9.41413	28	9.42926	31	0.57074	9.98486	96	1 3.1
05	9.41441	28	9.42957	30	0.57043	9.98484	95	2 6.2
06	9.41469	28	9.42987	30	0.57013	9.98482	94	3 9.3
07	9.41497	28	9.43017	30	0.56983	9.98480	93	4 12.4
08	9.41525	28	9.43047	30	0.56953	9.98478	92	5 15.5
09	9.41553	29	9.43077	31	0.56923	9.98476	91	6 18.6
10	9.41582	28	9.43108	30	0.56892	9.98474	90	7 21.7
11	9.41610	28	9.43138	30	0.56862	9.98472	89	8 24.8
12	9.41638	28	9.43168	30	0.56832	9.98470	88	9 27.9
13	9.41666	28	9.43198	30	0.56802	9.98468	87	
14	9.41694	28	9.43228	30	0.56772	9.98466	86	
15	9.41722	28	9.43258	30	0.56742	9.98464	85	
16	9.41750	28	9.43288	30	0.56712	9.98462	84	30
17	9.41778	28	9.43318	30	0.56682	9.98460	83	1 3.0
18	9.41806	28	9.43348	30	0.56652	9.98458	82	2 6.0
19	9.41834	27	9.43378	30	0.56622	9.98456	81	3 9.0
20	9.41861	28	9.43408	30	0.56592	9.98453	80	4 12.0
21	9.41889	28	9.43438	30	0.56562	9.98451	79	5 15.0
22	9.41917	28	9.43468	30	0.56532	9.98449	78	6 18.0
23	9.41945	28	9.43498	30	0.56502	9.98447	77	7 21.0
24	9.41973	28	9.43528	30	0.56472	9.98445	76	8 24.0
25	9.42001	28	9.43558	29	0.56442	9.98443	75	9 27.0
26	9.42029	27	9.43587	30	0.56413	9.98441	74	
27	9.42056	28	9.43617	30	0.56383	9.98439	73	29
28	9.42084	28	9.43647	30	0.56353	9.98437	72	1 2.9
29	9.42112	28	9.43677	30	0.56323	9.98435	71	2 5.8
30	9.42140	27	9.43707	29	0.56293	9.98433	70	3 8.7
31	9.42167	28	9.43736	30	0.56264	9.98431	69	4 11.6
32	9.42195	28	9.43766	30	0.56234	9.98429	68	5 14.5
33	9.42223	27	9.43796	30	0.56204	9.98427	67	6 17.4
34	9.42250	28	9.43826	29	0.56174	9.98425	66	7 20.3
35	9.42278	27	9.43855	30	0.56145	9.98422	65	8 23.2
36	9.42305	28	9.43885	30	0.56115	9.98420	64	9 26.1
37	9.42333	28	9.43915	29	0.56085	9.98418	63	
38	9.42361	27	9.43944	30	0.56056	9.98416	62	
39	9.42388	28	9.43974	30	0.56026	9.98414	61	28
40	9.42416	27	9.44004	29	0.55996	9.98412	60	1 2.8
41	9.42443	28	9.44033	30	0.55967	9.98410	59	2 5.6
42	9.42471	27	9.44063	29	0.55937	9.98408	58	3 8.4
43	9.42498	28	9.44092	30	0.55908	9.98406	57	4 11.2
44	9.42526	27	9.44122	29	0.55878	9.98404	56	5 14.0
45	9.42553	27	9.44151	30	0.55849	9.98402	55	6 16.8
46	9.42580	28	9.44181	29	0.55819	9.98399	54	7 19.6
47	9.42608	27	9.44210	30	0.55790	9.98397	53	8 22.4
48	9.42635	28	9.44240	29	0.55760	9.98395	52	9 25.2
49	9.42663	27	9.44269	30	0.55731	9.98393	51	
50	9.42690		9.44299		0.55701	9.98391	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

74°

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TABLE LII.—*Common logarithms of circular functions*—Continued

15°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.42690	27	9.44299	29	0.55701	9.98391	50	
51	9.42717	28	9.44328	30	0.55672	9.98389	49	
52	9.42745	27	9.44358	29	0.55642	9.98387	48	
53	9.42772	27	9.44387	29	0.55613	9.98385	47	
54	9.42799	27	9.44416	30	0.55584	9.98383	46	29
55	9.42826	28	9.44446	29	0.55554	9.98381	45	1 2.9
56	9.42854	27	9.44475	29	0.55525	9.98378	44	2 5.8
57	9.42881	27	9.44504	30	0.55496	9.98376	43	3 8.7
58	9.42908	27	9.44534	29	0.55466	9.98374	42	4 11.6
59	9.42935	27	9.44563	29	0.55437	9.98372	41	5 14.5
60	9.42962	27	9.44592	30	0.55408	9.98370	40	6 17.4
61	9.42989	28	9.44622	29	0.55378	9.98368	39	7 20.3
62	9.43017	27	9.44651	29	0.55349	9.98366	38	8 23.2
63	9.43044	27	9.44680	29	0.55320	9.98364	37	9 26.1
64	9.43071	27	9.44709	29	0.55291	9 98361	36	
65	9 43098	27	9.44738	30	0.55262	9.98359	35	
66	9.43125	27	9 44768	29	0.55232	9.98357	34	28
67	9.43152	27	9.44797	29	0.55203	9.98355	33	1 2.8
68	9.43179	27	9.44826	29	0.55174	9.98353	32	2 5.6
69	9.43206	27	9.44855	29	0.55145	9.98351	31	3 8.4
70	9.43233	27	9.44884	29	0.55116	9.98349	30	4 11.2
71	9.43260	27	9.44913	29	0.55087	9.98347	29	5 14.0
72	9.43287	27	9.44942	29	0.55058	9.98344	28	6 16.8
73	9.43314	27	9.44971	29	0.55029	9.98342	27	7 19.6
74	9.43341	26	9.45000	29	0.55000	9.98340	26	8 22.4
75	9.43367	27	9.45029	29	0.54971	9.98338	25	9 25.2
76	9.43394	27	9.45058	29	0.54942	9.98336	24	
77	9.43421	27	9.45087	29	0.54913	9.98334	23	
78	9.43448	27	9.45116	29	0.54884	9.98332	22	27
79	9.43475	27	9.45145	29	0.54855	9.98329	21	1 2.7
80	9.43502	26	9.45174	29	0.54826	9.98327	20	2 5.4
81	9.43528	27	9.45203	29	0.54797	9.98325	19	3 8.1
82	9.43555	27	9.45232	29	0.54768	9.98323	18	4 10.8
83	9.43582	27	9.45261	29	0.54739	9.98321	17	5 13.5
84	9.43609	26	9.45290	29	0.54710	9.98319	16	6 16.2
85	9.43635	27	9.45319	29	0.54681	9.98317	15	7 18.9
86	9.43662	27	9.45348	28	0.54652	9.98314	14	8 21.6
87	9.43689	26	9.45376	29	0.54624	9.98312	13	9 24.3
88	9.43715	27	9.45405	29	0.54595	9.98310	12	
89	9.43742	27	9.45434	29	0.54566	9.98308	11	
90	9.43769	26	9.45463	29	0.54537	9.98306	10	26
91	9.43795	27	9.45492	28	0.54508	9.98304	09	1 2.6
92	9.43822	26	9.45520	29	0.54480	9.98302	08	2 5.2
93	9.43848	27	9.45549	29	0.54451	9.98299	07	3 7.8
94	9.43875	26	9.45578	28	0.54422	9.98297	06	4 10.4
95	9.43901	27	9.45606	29	0.54394	9.98295	05	5 13.0
96	9.43928	26	9.45635	29	0.54365	9.98293	04	6 15.6
97	9.43954	27	9.45664	28	0.54336	9.98291	03	7 18.2
98	9.43981	26	9.45692	29	0.54308	9.98289	02	8 20.8
99	9.44007	27	9.45721	29	0.54279	9.98286	01	9 23.4
100	9.44034		9.45750		0.54250	9.98284	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
74°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
			16°					
00	9.44034	26	9.45750	28	0.54250	9.98284	100	
01	9.44060	27	9.45778	29	0.54222	9.98282	99	
02	9.44087	26	9.45807	28	0.54193	9.98280	98	
03	9.44113	26	9.45835	29	0.54165	9.98278	97	29
04	9.44139	27	9.45864	28	0.54136	9.98275	96	1 2.9
05	9.44166	26	9.45892	29	0.54108	9.98273	95	2 5.8
06	9.44192	26	9.45921	29	0.54079	9.98271	94	3 8.7
07	9.44218	27	9.45950	28	0.54050	9.98269	93	4 11.6
08	9.44245	26	9.45978	28	0.54022	9.98267	92	5 14.5
09	9.44271	26	9.46006	29	0.53994	9.98265	91	6 17.4
10	9.44297	27	9.46035	28	0.53965	9.98262	90	7 20.3
11	9.44324	26	9.46063	29	0.53937	9.98260	89	8 23.2
12	9.44350	26	9.46092	28	0.53908	9.98258	88	9 26.1
13	9.44376	26	9.46120	29	0.53880	9.98256	87	
14	9.44402	26	9.46149	28	0.53851	9.98254	86	28
15	9.44428	27	9.46177	28	0.53823	9.98251	85	1 2.8
16	9.44455	26	9.46205	29	0.53795	9.98249	84	2 5.6
17	9.44481	26	9.46234	28	0.53766	9.98247	83	3 8.4
18	9.44507	26	9.46262	28	0.53738	9.98245	82	4 11.2
19	9.44533	26	9.46290	29	0.53710	9.98243	81	5 14.0
20	9.44559	26	9.46319	28	0.53681	9.98240	80	6 16.8
21	9.44585	26	9.46347	28	0.53653	9.98238	79	7 19.6
22	9.44611	26	9.46375	28	0.53625	9.98236	78	8 22.4
23	9.44637	26	9.46403	29	0.53597	9.98234	77	9 25.2
24	9.44663	26	9.46432	28	0.53568	9.98232	76	
25	9.44689	26	9.46460	28	0.53540	9.98229	75	
26	9.44715	26	9.46488	28	0.53512	9.98227	74	
27	9.44741	26	9.46516	28	0.53484	9.98225	73	
28	9.44767	26	9.46544	29	0.53456	9.98223	72	
29	9.44793	26	9.46573	28	0.53427	9.98221	71	27
30	9.44819	26	9.46601	28	0.53399	9.98218	70	1 2.7
31	9.44845	26	9.46629	28	0.53371	9.98216	69	2 5.4
32	9.44871	26	9.46657	28	0.53343	9.98214	68	3 8.1
33	9.44897	26	9.46685	28	0.53315	9.98212	67	4 10.8
34	9.44923	25	9.46713	28	0.53287	9.98209	66	5 13.5
35	9.44948	26	9.46741	28	0.53259	9.98207	65	6 16.2
36	9.44974	26	9.46769	28	0.53231	9.98205	64	7 18.9
37	9.45000	26	9.46797	28	0.53203	9.98203	63	8 21.6
38	9.45026	26	9.46825	28	0.53175	9.98201	62	9 24.3
39	9.45052	25	9.46853	28	0.53147	9.98198	61	
40	9.45077	26	9.46881	28	0.53119	9.98196	60	26
41	9.45103	26	9.46909	28	0.53091	9.98194	59	1 2.6
42	9.45129	26	9.46937	28	0.53063	9.98192	58	2 5.2
43	9.45155	25	9.46965	28	0.53035	9.98189	57	3 7.8
44	9.45180	26	9.46993	28	0.53007	9.98187	56	4 10.4
45	9.45206	26	9.47021	28	0.52979	9.98185	55	5 13.0
46	9.45232	25	9.47049	28	0.52951	9.98183	54	6 15.6
47	9.45257	26	9.47077	28	0.52923	9.98180	53	7 18.2
48	9.45283	26	9.47105	28	0.52895	9.98178	52	8 20.8
49	9.45309	25	9.47133	27	0.52867	9.98176	51	9 23.4
50	9.45334		9.47160		0.52840	9.98174	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
			73°					

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TABLE LII.—*Common logarithms of circular functions*—Continued

16°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	
50	9.45334	26	9.47160	28	0.52840	9.98174	50
51	9.45360	25	9.47188	28	0.52812	9.98171	49
52	9.45385	26	9.47216	28	0.52784	9.98169	48
53	9.45411	25	9.47244	28	0.52756	9.98167	47
54	9.45436	26	9.47272	27	0.52728	9.98165	46
55	9.45462	25	9.47299	28	0.52701	9.98162	45
56	9.45487	26	9.47327	28	0.52673	9.98160	44
57	9.45513	25	9.47355	28	0.52645	9.98158	43
58	9.45538	26	9.47383	27	0.52617	9.98156	42
59	9.45564	25	9.47410	28	0.52590	9.98153	41
60	9.45589	26	9.47438	28	0.52562	9.98151	40
61	9.45615	25	9.47466	27	0.52534	9.98149	39
62	9.45640	25	9.47493	28	0.52507	9.98147	38
63	9.45665	26	9.47521	28	0.52479	9.98144	37
64	9.45691	25	9.47549	27	0.52451	9.98142	36
65	9.45716	26	9.47576	28	0.52424	9.98140	35
66	9.45742	25	9.47604	28	0.52396	9.98138	34
67	9.45767	25	9.47632	27	0.52368	9.98135	33
68	9.45792	25	9.47659	28	0.52341	9.98133	32
69	9.45817	26	9.47687	27	0.52313	9.98131	31
70	9.45843	25	9.47714	28	0.52286	9.98129	30
71	9.45868	25	9.47742	27	0.52258	9.98126	29
72	9.45893	25	9.47769	28	0.52231	9.98124	28
73	9.45918	26	9.47797	27	0.52203	9.98122	27
74	9.45944	25	9.47824	28	0.52176	9.98119	26
75	9.45969	25	9.47852	27	0.52148	9.98117	25
76	9.45994	25	9.47879	28	0.52121	9.98115	24
77	9.46019	25	9.47907	27	0.52093	9.98113	23
78	9.46044	25	9.47934	27	0.52066	9.98110	22
79	9.46069	26	9.47961	28	0.52039	9.98108	21
80	9.46095	25	9.47989	27	0.52011	9.98106	20
81	9.46120	25	9.48016	28	0.51984	9.98103	19
82	9.46145	25	9.48044	27	0.51956	9.98101	18
83	9.46170	25	9.48071	27	0.51929	9.98099	17
84	9.46195	25	9.48098	28	0.51902	9.98097	16
85	9.46220	25	9.48126	27	0.51874	9.98094	15
86	9.46245	25	9.48153	27	0.51847	9.98092	14
87	9.46370	25	9.48180	28	0.51820	9.98090	13
88	9.46295	25	9.48208	27	0.51792	9.98087	12
89	9.46320	25	9.48235	27	0.51765	9.98085	11
90	9.46345	25	9.48262	27	0.51738	9.98083	10
91	9.46370	25	9.48289	28	0.51711	9.98080	09
92	9.46395	25	9.48317	27	0.51683	9.98078	08
93	9.46420	24	9.48344	27	0.51656	9.98076	07
94	9.46444	25	9.48371	27	0.51629	9.98074	06
95	9.46469	25	9.48398	27	0.51602	9.98071	05
96	9.46494	25	9.48425	28	0.51575	9.98069	04
97	9.46519	25	9.48453	27	0.51547	9.98067	03
98	9.46544	25	9.48480	27	0.51520	9.98064	02
99	9.46569	25	9.48507	27	0.51493	9.98062	01
100	9.46594		9.48534		0.51466	9.98060	00
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	

Prop. Pts.	
	28
1	2.8
2	5.6
3	8.4
4	11.2
5	14.0
6	16.8
7	19.6
8	22.4
9	25.2
	27
1	2.7
2	5.4
3	8.1
4	10.8
5	13.5
6	16.2
7	18.9
8	21.6
9	24.3
	25
1	2.5
2	5.0
3	7.5
4	10.0
5	12.5
6	15.0
7	17.5
8	20.0
9	22.5
	24
1	2.4
2	4.8
3	7.2
4	9.6
5	12.0
6	14.4
7	16.8
8	19.2
9	21.6

Prop. Pts.

73°

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TABLE LII.—*Common logarithms of circular functions*—Continued

17°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.46594	24	9.48534	27	0.51466	9.98060	100	
01	9.46618	25	9.48561	27	0.51439	9.98057	99	
02	9.46643	25	9.48588	27	0.51412	9.98055	98	
03	9.46668	25	9.48615	27	0.51385	9.98053	97	
04	9.46693	24	9.48642	27	0.51358	9.98050	96	27
05	9.46717	25	9.48669	27	0.51331	9.98048	95	1 2.7
06	9.46742	25	9.48696	27	0.51304	9.98046	94	2 5.4
07	9.46767	24	9.48723	27	0.51277	9.98043	93	3 8.1
08	9.46791	25	9.48750	27	0.51250	9.98041	92	4 10.8
09	9.46816	25	9.48777	27	0.51223	9.98039	91	5 13.5
10	9.46841	24	9.48804	27	0.51196	9.98036	90	6 16.2
11	9.46865	25	9.48831	27	0.51169	9.98034	89	7 18.9
12	9.46890	25	9.48858	27	0.51142	9.98032	88	8 21.6
13	9.46915	24	9.48885	27	0.51115	9.98029	87	9 24.3
14	9.46939	25	9.48912	27	0.51088	9.98027	86	
15	9.46964	24	9.48939	27	0.51061	9.98025	85	26
16	9.46988	25	9.48966	27	0.51034	9.98022	84	1 2.6
17	9.47013	24	9.48993	27	0.51007	9.98020	83	2 5.2
18	9.47037	25	9.49020	26	0.50980	9.98018	82	3 7.8
19	9.47062	24	9.49046	27	0.50954	9.98015	81	4 10.4
20	9.47086	25	9.49073	27	0.50927	9.98013	80	5 13.0
21	9.47111	24	9.49100	27	0.50900	9.98011	79	6 15.6
22	9.47135	25	9.49127	27	0.50873	9.98008	78	7 18.2
23	9.47160	24	9.49154	27	0.50846	9.98006	77	8 20.8
24	9.47184	25	9.49181	26	0.50819	9.98004	76	9 23.4
25	9.47209	24	9.49207	27	0.50793	9.98001	75	
26	9.47233	24	9.49234	27	0.50766	9.97999	74	
27	9.47257	25	9.49261	27	0.50739	9.97997	73	
28	9.47282	24	9.49288	26	0.50712	9.97994	72	
29	9.47306	24	9.49314	27	0.50686	9.97992	71	25
30	9.47330	25	9.49341	27	0.50659	9.97989	70	1 2.5
31	9.47355	24	9.49368	26	0.50632	9.97987	69	2 5.0
32	9.47379	24	9.49394	27	0.50606	9.97985	68	3 7.5
33	9.47403	25	9.49421	27	0.50579	9.97982	67	4 10.0
34	9.47428	24	9.49448	26	0.50552	9.97980	66	5 12.5
35	9.47452	24	9.49474	27	0.50526	9.97978	65	6 15.0
36	9.47476	24	9.49501	27	0.50499	9.97975	64	7 17.5
37	9.47500	25	9.49528	26	0.50472	9.97973	63	8 20.0
38	9.47525	24	9.49554	27	0.50446	9.97971	62	9 22.5
39	9.47549	24	9.49581	26	0.50419	9.97968	61	
40	9.47573	24	9.49607	27	0.50393	9.97966	60	24
41	9.47597	24	9.49634	26	0.50366	9.97963	59	1 2.4
42	9.47621	25	9.49660	27	0.50340	9.97961	58	2 4.8
43	9.47646	24	9.49687	26	0.50313	9.97959	57	3 7.2
44	9.47670	24	9.49713	27	0.50287	9.97956	56	4 9.6
45	9.47694	24	9.49740	26	0.50260	9.97954	55	5 12.0
46	9.47718	24	9.49766	27	0.50234	9.97951	54	6 14.4
47	9.47742	24	9.49793	26	0.50207	9.97949	53	7 16.8
48	9.47766	24	9.49819	27	0.50181	9.97947	52	8 19.2
49	9.47790	24	9.49846	26	0.50154	9.97944	51	9 21.6
50	9.47814		9.49872		0.50128	9.97942	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

72°

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TABLE LII.—*Common logarithms of circular functions*—Continued

17°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9.47814	24	9.49872	27	0.50128	9.97942	50	
51	9.47838	24	9.49899	26	0.50101	9.97940	49	
52	9.47862	24	9.49925	26	0.50075	9.97937	48	
53	9.47886	24	9.49951	27	0.50049	9.97935	47	27
54	9.47910	24	9.49978	26	0.50022	9.97932	46	1 2.7
55	9.47934	24	9.50004	27	0.49996	9.97930	45	2 5.4
56	9.47958	24	9.50031	26	0.49969	9.97928	44	3 8.1
57	9.47982	24	9.50057	26	0.49943	9.97925	43	4 10.8
58	9.48006	24	9.50083	27	0.49917	9.97923	42	5 13.5
59	9.48030	24	9.50110	26	0.49890	9.97920	41	6 16.2
60	9.48054	24	9.50136	26	0.49864	9.97918	40	7 18.9
61	9.48078	24	9.50162	26	0.49838	9.97916	39	8 21.6
62	9.48102	23	9.50188	27	0.49812	9.97913	38	9 24.3
63	9.48125	24	9.50215	26	0.49785	9.97911	37	
64	9.48149	24	9.50241	26	0.49759	9.97908	36	26
65	9.48173	24	9.50267	26	0.49733	9.97906	35	1 2.6
66	9.48197	24	9.50293	27	0.49707	9.97904	34	2 5.2
67	9.48221	24	9.50320	26	0.49680	9.97901	33	3 7.8
68	9.48245	23	9.50346	26	0.49654	9.97899	32	4 10.4
69	9.48268	24	9.50372	26	0.49628	9.97896	31	5 13.0
70	9.48292	24	9.50398	26	0.49602	9.97894	30	6 15.6
71	9.48316	24	9.50424	27	0.49576	9.97891	29	7 18.2
72	9.48340	23	9.50451	26	0.49549	9.97889	28	8 20.8
73	9.48363	24	9.50477	26	0.49523	9.97887	27	9 23.4
74	9.48387	24	9.50503	26	0.49497	9.97884	26	
75	9.48411	23	9.50529	26	0.49471	9.97882	25	
76	9.48434	24	9.50555	26	0.49445	9.97879	24	
77	9.48458	24	9.50581	26	0.49419	9.97877	23	
78	9.48482	23	9.50607	26	0.49393	9.97874	22	
79	9.48505	24	9.50633	26	0.49367	9.97872	21	24
80	9.48529	23	9.50659	26	0.49341	9.97870	20	1 2.4
81	9.48552	24	9.50685	26	0.49315	9.97867	19	2 4.8
82	9.48576	24	9.50711	26	0.49289	9.97865	18	3 7.2
83	9.48600	23	9.50737	26	0.49263	9.97862	17	4 9.6
84	9.48623	24	9.50763	26	0.49237	9.97860	16	5 12.0
85	9.48647	23	9.50789	26	0.49211	9.97857	15	6 14.4
86	9.48670	24	9.50815	26	0.49185	9.97855	14	7 16.8
87	9.48694	23	9.50841	26	0.49159	9.97853	13	8 19.2
88	9.48717	24	9.50867	26	0.49133	9.97850	12	9 21.6
89	9.48741	23	9.50893	26	0.49107	9.97848	11	
90	9.48764	24	9.50919	26	0.49081	9.97845	10	23
91	9.48788	23	9.50945	26	0.49055	9.97843	09	1 2.3
92	9.48811	24	9.50971	26	0.49029	9.97840	08	2 4.6
93	9.48835	23	9.50997	26	0.49003	9.97838	07	3 6.9
94	9.48858	23	9.51023	25	0.48977	9.97835	06	4 9.2
95	9.48881	24	9.51048	26	0.48952	9.97833	05	5 11.5
96	9.48905	23	9.51074	26	0.48926	9.97830	04	6 13.8
97	9.48928	24	9.51100	26	0.48900	9.97828	03	7 16.1
98	9.48952	23	9.51126	26	0.48874	9.97826	02	8 18.4
99	9.48975	23	9.51152	26	0.48848	9.97823	01	9 20.7
100	9.48998		9.51178		0.48822	9.97821	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
72°								5

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TABLE LII.—*Common logarithms of circular functions*—Continued

18°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.48998	24	9.51178	25	0.48822	9.97821	100	
01	9.49022	23	9.51203	26	0.48797	9.97818	99	
02	9.49045	23	9.51229	26	0.48771	9.97816	98	
03	9.49068	23	9.51255	26	0.48745	9.97813	97	26
04	9.49091	24	9.51281	25	0.48719	9.97811	96	1 2.6
05	9.49115	23	9.51306	26	0.48694	9.97808	95	2 5.2
06	9.49138	23	9.51332	26	0.48668	9.97806	94	3 7.8
07	9.49161	23	9.51358	26	0.48642	9.97803	93	4 10.4
08	9.49184	24	9.51384	25	0.48616	9.97801	92	5 13.0
09	9.49208	23	9.51409	26	0.48591	9.97798	91	6 15.6
10	9.49231	23	9.51435	26	0.48565	9.97796	90	7 18.2
11	9.49254	23	9.51461	25	0.48539	9.97793	89	8 20.8
12	9.49277	23	9.51486	26	0.48514	9.97791	88	9 23.4
13	9.49300	23	9.51512	25	0.48488	9.97788	87	
14	9.49323	24	9.51537	26	0.48463	9.97786	86	25
15	9.49347	23	9.51563	26	0.48437	9.97784	85	1 2.5
16	9.49370	23	9.51589	25	0.48411	9.97781	84	2 5.0
17	9.49393	23	9.51614	26	0.48386	9.97779	83	3 7.5
18	9.49416	23	9.51640	25	0.48360	9.97776	82	4 10.0
19	9.49439	23	9.51665	26	0.48335	9.97774	81	5 12.5
20	9.49462	23	9.51691	26	0.48309	9.97771	80	6 15.0
21	9.49485	23	9.51717	25	0.48283	9.97769	79	7 17.5
22	9.49508	23	9.51742	26	0.48258	9.97766	78	8 20.0
23	9.49531	23	9.51768	25	0.48232	9.97764	77	9 22.5
24	9.49554	23	9.51793	26	0.48207	9.97761	76	
25	9.49577	23	9.51819	25	0.48181	9.97759	75	
26	9.49600	23	9.51844	26	0.48156	9.97756	74	
27	9.49623	23	9.51870	25	0.48130	9.97754	73	
28	9.49646	23	9.51895	25	0.48105	9.97751	72	
29	9.49669	23	9.51920	26	0.48080	9.97749	71	
30	9.49692	23	9.51946	25	0.48054	9.97746	70	24
31	9.49715	23	9.51971	26	0.48029	9.97744	69	1 2.4
32	9.49738	23	9.51997	25	0.48003	9.97741	68	2 4.8
33	9.49761	22	9.52022	25	0.47978	9.97739	67	3 7.2
34	9.49783	23	9.52047	26	0.47953	9.97736	66	4 9.6
35	9.49806	23	9.52073	25	0.47927	9.97734	65	5 12.0
36	9.49829	23	9.52098	26	0.47902	9.97731	64	6 14.4
37	9.49852	23	9.52124	25	0.47876	9.97729	63	7 16.8
38	9.49875	23	9.52149	25	0.47851	9.97726	62	8 19.2
39	9.49898	22	9.52174	26	0.47826	9.97723	61	9 21.6
40	9.49920	23	9.52200	25	0.47800	9.97721	60	23
41	9.49943	23	9.52225	25	0.47775	9.97718	59	1 2.3
42	9.49966	23	9.52250	25	0.47750	9.97716	58	2 4.6
43	9.49989	22	9.52275	26	0.47725	9.97713	57	3 6.9
44	9.50011	23	9.52301	25	0.47699	9.97711	56	4 9.2
45	9.50034	23	9.52326	25	0.47674	9.97708	55	5 11.5
46	9.50057	23	9.52351	25	0.47649	9.97706	54	6 13.8
47	9.50080	22	9.52376	26	0.47624	9.97703	53	7 16.1
48	9.50102	23	9.52402	25	0.47598	9.97701	52	8 18.4
49	9.50125	23	9.52427	25	0.47573	9.97698	51	9 20.7
50	9.50148		9.52452		0.47548	9.97696	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.

71°

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
			18°					
50	9. 50148	22	9. 52452	25	0. 47548	9. 97696	50	
51	9. 50170	23	9. 52477	25	0. 47523	9. 97693	49	
52	9. 50193	23	9. 52502	26	0. 47498	9. 97691	48	
53	9. 50216	22	9. 52528	25	0. 47472	9. 97688	47	
54	9. 50238	23	9. 52553	25	0. 47447	9. 97686	46	25
55	9. 50261	22	9. 52578	25	0. 47422	9. 97683	45	1 2. 5
56	9. 50283	23	9. 52603	25	0. 47397	9. 97680	44	2 5. 0
57	9. 50306	22	9. 52628	25	0. 47372	9. 97678	43	3 7. 5
58	9. 50328	23	9. 52653	25	0. 47347	9. 97675	42	4 10. 0
59	9. 50351	23	9. 52678	25	0. 47322	9. 97673	41	5 12. 5
60	9. 50374	22	9. 52703	25	0. 47297	9. 97670	40	6 15. 0
61	9. 50396	23	9. 52728	25	0. 47272	9. 97668	39	7 17. 5
62	9. 50419	22	9. 52753	25	0. 47247	9. 97665	38	8 20. 0
63	9. 50441	23	9. 52778	26	0. 47222	9. 97663	37	9 22. 5
64	9. 50464	22	9. 52804	25	0. 47196	9. 97660	36	
65	9. 50486	22	9. 52829	25	0. 47171	9. 97657	35	
66	9. 50508	23	9. 52854	25	0. 47146	9. 97655	34	24
67	9. 50531	22	9. 52879	25	0. 47121	9. 97652	33	1 2. 4
68	9. 50553	23	9. 52904	25	0. 47096	9. 97650	32	2 4. 8
69	9. 50576	22	9. 52929	24	0. 47071	9. 97647	31	3 7. 2
70	9. 50598	22	9. 52953	25	0. 47047	9. 97645	30	4 9. 6
71	9. 50620	23	9. 52978	25	0. 47022	9. 97642	29	5 12. 0
72	9. 50643	22	9. 53003	25	0. 46997	9. 97640	28	6 14. 4
73	9. 50665	23	9. 53028	25	0. 46972	9. 97637	27	7 16. 8
74	9. 50688	22	9. 53053	25	0. 46947	9. 97634	26	8 19. 2
75	9. 50710	22	9. 53078	25	0. 46922	9. 97632	25	9 21. 6
76	9. 50732	23	9. 53103	25	0. 46897	9. 97629	24	
77	9. 50755	22	9. 53128	25	0. 46872	9. 97627	23	
78	9. 50777	22	9. 53153	25	0. 46847	9. 97624	22	23
79	9. 50799	22	9. 53178	24	0. 46822	9. 97621	21	1 2. 3
80	9. 50821	23	9. 53202	25	0. 46798	9. 97619	20	2 4. 6
81	9. 50844	22	9. 53227	25	0. 46773	9. 97616	19	3 6. 9
82	9. 50866	22	9. 53252	25	0. 46748	9. 97614	18	4 9. 2
83	9. 50888	22	9. 53277	25	0. 46723	9. 97611	17	5 11. 5
84	9. 50910	23	9. 53302	25	0. 46698	9. 97609	16	6 13. 8
85	9. 50933	22	9. 53327	24	0. 46673	9. 97606	15	7 16. 1
86	9. 50955	22	9. 53351	25	0. 46649	9. 97603	14	8 18. 4
87	9. 50977	22	9. 53376	25	0. 46624	9. 97601	13	9 20. 7
88	9. 50999	22	9. 53401	25	0. 46599	9. 97598	12	
89	9. 51021	22	9. 53426	24	0. 46574	9. 97596	11	
90	9. 51043	23	9. 53450	25	0. 46550	9. 97593	10	22
91	9. 51066	22	9. 53475	25	0. 46525	9. 97590	09	1 2. 2
92	9. 51088	22	9. 53500	25	0. 46500	9. 97588	08	2 4. 4
93	9. 51110	22	9. 53525	24	0. 46475	9. 97585	07	3 6. 6
94	9. 51132	22	9. 53549	25	0. 46451	9. 97583	06	4 8. 8
95	9. 51154	22	9. 53574	25	0. 46426	9. 97580	05	5 11. 0
96	9. 51176	22	9. 53599	24	0. 46401	9. 97577	04	6 13. 2
97	9. 51198	22	9. 53623	25	0. 46377	9. 97575	03	7 15. 4
98	9. 51220	22	9. 53648	25	0. 46352	9. 97572	02	8 17. 6
99	9. 51242	22	9. 53673	24	0. 46327	9. 97570	01	9 19. 8
100	9. 51264		9. 53697		0. 46303	9. 97567	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
			71°					

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TABLE LII.—*Common logarithms of circular functions*—Continued

	19°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.51264	22	9.53697	25	0.46303	9.97567	100	
01	9.51286	22	9.53722	24	0.46278	9.97564	99	
02	9.51308	22	9.53746	25	0.46254	9.97562	98	
03	9.51330	22	9.53771	25	0.46229	9.97559	97	
04	9.51352	22	9.53796	24	0.46204	9.97557	96	25
05	9.51374	22	9.53820	25	0.46180	9.97554	95	1 2.5
06	9.51396	22	9.53845	24	0.46155	9.97551	94	2 5.0
07	9.51418	22	9.53869	25	0.46131	9.97549	93	3 7.5
08	9.51440	22	9.53894	24	0.46106	9.97546	92	4 10.0
09	9.51462	22	9.53918	25	0.46082	9.97543	91	5 12.5
10	9.51484	22	9.53943	24	0.46057	9.97541	90	6 15.0
11	9.51506	21	9.53967	25	0.46033	9.97538	89	7 17.5
12	9.51527	22	9.53992	24	0.46008	9.97536	88	8 20.0
13	9.51549	22	9.54016	25	0.45984	9.97533	87	9 22.5
14	9.51571	22	9.54041	24	0.45959	9.97530	86	
15	9.51593	22	9.54065	25	0.45935	9.97528	85	24
16	9.51615	22	9.54090	24	0.45910	9.97525	84	1 2.4
17	9.51637	21	9.54114	25	0.45886	9.97522	83	2 4.8
18	9.51658	22	9.54139	24	0.45861	9.97520	82	3 7.2
19	9.51680	22	9.54163	24	0.45837	9.97517	81	4 9.6
20	9.51702	22	9.54187	25	0.45813	9.97515	80	5 12.0
21	9.51724	21	9.54212	24	0.45788	9.97512	79	6 14.4
22	9.51745	22	9.54236	25	0.45764	9.97509	78	7 16.8
23	9.51767	22	9.54261	24	0.45739	9.97507	77	8 19.2
24	9.51789	22	9.54285	24	0.45715	9.97504	76	9 21.6
25	9.51811	21	9.54309	25	0.45691	9.97501	75	
26	9.51832	22	9.54334	24	0.45666	9.97499	74	
27	9.51854	22	9.54358	24	0.45642	9.97496	73	
28	9.51876	21	9.54382	25	0.45618	9.97493	72	
29	9.51897	22	9.54407	24	0.45593	9.97491	71	22
30	9.51919	22	9.54431	24	0.45569	9.97488	70	1 2.2
31	9.51941	21	9.54455	25	0.45545	9.97485	69	2 4.4
32	9.51962	22	9.54480	24	0.45520	9.97483	68	3 6.6
33	9.51984	22	9.54504	24	0.45496	9.97480	67	4 8.8
34	9.52006	21	9.54528	24	0.45472	9.97477	66	5 11.0
35	9.52027	22	9.54552	25	0.45448	9.97475	65	6 13.2
36	9.52049	21	9.54577	24	0.45423	9.97472	64	7 15.4
37	9.52070	22	9.54601	24	0.45399	9.97469	63	8 17.6
38	9.52092	21	9.54625	24	0.45375	9.97467	62	9 19.8
39	9.52113	22	9.54649	24	0.45351	9.97464	61	
40	9.52135	21	9.54673	25	0.45327	9.97461	60	21
41	9.52156	22	9.54698	24	0.45302	9.97459	59	1 2.1
42	9.52178	21	9.54722	24	0.45278	9.97456	58	2 4.2
43	9.52199	22	9.54746	24	0.45254	9.97453	57	3 6.3
44	9.52221	21	9.54770	24	0.45230	9.97451	56	4 8.4
45	9.52242	22	9.54794	24	0.45206	9.97448	55	5 10.5
46	9.52264	21	9.54818	25	0.45182	9.97445	54	6 12.6
47	9.52285	22	9.54843	24	0.45157	9.97443	53	7 14.7
48	9.52307	21	9.54867	24	0.45133	9.97440	52	8 16.8
49	9.52328	22	9.54891	24	0.45109	9.97437	51	9 18.9
50	9.52350		9.54915		0.45085	9.97435	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
	70°							

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
					19°			
50	9. 52350	21	9. 54915	24	0. 45085	9. 97435	50	
51	9. 52371	21	9. 54939	24	0. 45061	9. 97432	49	
52	9. 52392	22	9. 54963	24	0. 45037	9. 97429	48	
53	9. 52414	21	9. 54987	24	0. 45013	9. 97427	47	24
54	9. 52435	21	9. 55011	24	0. 44989	9. 97424	46	1 2. 4
55	9. 52456	22	9. 55035	24	0. 44965	9. 97421	45	2 4. 8
56	9. 52478	21	9. 55059	24	0. 44941	9. 97419	44	3 7. 2
57	9. 52499	21	9. 55083	24	0. 44917	9. 97416	43	4 9. 6 5 12. 0
58	9. 52520	22	9. 55107	24	0. 44893	9. 97413	42	6 14. 4
59	9. 52542	21	9. 55131	24	0. 44869	9. 97410	41	7 16. 8 8 19. 2
60	9. 52563	21	9. 55155	24	0. 44845	9 97408	40	9 21. 6
61	9. 52584	22	9. 55179	24	0. 44821	9. 97405	39	
62	9. 52606	21	9. 55203	24	0. 44797	9. 97402	38	
63	9. 52627	21	9. 55227	24	0. 44773	9. 97400	37	
64	9. 52648	21	9. 55251	24	0. 44749	9. 97397	36	23
65	9. 52669	21	9. 55275	24	0. 44725	9. 97394	35	1 2. 3
66	9. 52690	22	9. 55299	24	0. 44701	9. 97392	34	2 4. 6 3 6. 9
67	9. 52712	21	9. 55323	24	0. 44677	9. 97389	33	4 9. 2
68	9. 52733	21	9. 55347	24	0. 44653	9. 97386	32	5 11. 5
69	9. 52754	21	9. 55371	24	0. 44629	9. 97383	31	6 13. 8 7 16. 1
70	9. 52775	21	9. 55395	23	0. 44605	9. 97381	30	8 18. 4 9 20. 7
71	9. 52796	22	9. 55418	24	0. 44582	9. 97378	29	
72	9. 52818	21	9. 55442	24	0. 44558	9. 97375	28	
73	9. 52839	21	9. 55466	24	0. 44534	9. 97373	27	
74	9. 52860	21	9. 55490	24	0. 44510	9. 97370	26	
75	9. 52881	21	9. 55514	24	0. 44486	9. 97367	25	
76	9. 52902	21	9. 55538	24	0. 44462	9. 97364	24	
77	9. 52923	21	9. 55562	23	0. 44438	9. 97362	23	
78	9. 52944	21	9. 55585	24	0. 44415	9. 97359	22	21
79	9. 52965	21	9. 55609	24	0. 44391	9. 97356	21	1 2. 1
80	9. 52986	21	9. 55633	24	0. 44367	9. 97353	20	2 4. 2 3 6. 3
81	9. 53007	21	9. 55657	23	0. 44343	9. 97351	19	4 8. 4
82	9. 53028	21	9. 55680	24	0. 44320	9. 97348	18	5 10. 5
83	9. 53049	22	9. 55704	24	0. 44296	9. 97345	17	6 12. 6 7 14. 7
84	9. 53071	21	9. 55728	24	0. 44272	9. 97343	16	8 16. 8
85	9. 53092	20	9. 55752	23	0. 44248	9. 97340	15	9 18. 9
86	9. 53112	21	9. 55775	24	0. 44225	9. 97337	14	
87	9. 53133	21	9. 55799	24	0. 44201	9. 97334	13	
88	9. 53154	21	9. 55823	24	0. 44177	9. 97332	12	
89	9. 53175	21	9. 55847	23	0. 44153	9. 97329	11	20
90	9. 53196	21	9. 55870	24	0. 44130	9. 97326	10	1 2. 0
91	9. 53217	21	9. 55894	24	0. 44106	9. 97323	09	2 4. 0 3 6. 0
92	9. 53238	21	9. 55918	23	0. 44082	9. 97321	08	4 8. 0
93	9. 53259	21	9. 55941	24	0. 44059	9. 97318	07	5 10. 0 6 12. 0
94	9. 53280	21	9. 55965	24	0. 44035	9. 97315	06	7 14. 0
95	9. 53301	21	9. 55989	23	0. 44011	9. 97312	05	8 16. 0
96	9. 53322	21	9. 56012	24	0. 43988	9. 97310	04	9 18. 0
97	9. 53343	20	9. 56036	23	0. 43964	9. 97307	03	
98	9. 53363	21	9. 56059	24	0. 43941	9. 97304	02	
99	9. 53384	21	9. 56083	24	0. 43917	9. 97301	01	
100	9. 53405		9. 56107		0. 43893	9. 97299	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
					70°			

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TABLE LII.—*Common logarithms of circular functions*—Continued

20°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
00	9.53405	21	9.56107	23	0.43893	9.97299	100	
01	9.53426	21	9.56130	24	0.43870	9.97296	99	
02	9.53447	21	9.56154	23	0.43846	9.97293	98	
03	9.53468	20	9.56177	24	0.43823	9.97290	97	24
04	9.53488	21	9.56201	23	0.43799	9.97288	96	1 2.4
05	9.53509	21	9.56224	24	0.43776	9.97285	95	2 4.8
06	9.53530	21	9.56248	23	0.43752	9.97282	94	3 7.2
07	9.53551	20	9.56271	24	0.43729	9.97279	93	4 9.6
08	9.53571	21	9.56295	23	0.43705	9.97276	92	5 12.0
09	9.53592	21	9.56318	24	0.43682	9.97274	91	6 14.4
10	9.53613	21	9.56342	23	0.43658	9.97271	90	7 16.8
11	9.53634	20	9.56365	24	0.43635	9.97268	89	8 19.2
12	9.53654	21	9.56389	23	0.43611	9.97265	88	9 21.6
13	9.53675	21	9.56412	24	0.43588	9.97263	87	
14	9.53696	20	9.56436	23	0.43564	9.97260	86	23
15	9.53716	21	9.56459	24	0.43541	9.97257	85	1 2.3
16	9.53737	21	9.56483	23	0.43517	9.97254	84	2 4.6
17	9.53758	20	9.56506	24	0.43494	9.97251	83	3 6.9
18	9.53778	21	9.56530	23	0.43470	9.97249	82	4 9.2
19	9.53799	20	9.56553	23	0.43447	9.97246	81	5 11.5
20	9.53819	21	9.56576	24	0.43424	9.97243	80	6 13.8
21	9.53840	21	9.56600	23	0.43400	9.97240	79	7 16.1
22	9.53861	20	9.56623	23	0.43377	9.97238	78	8 18.4
23	9.53881	21	9.56646	24	0.43354	9.97235	77	9 20.7
24	9.53902	20	9.56670	23	0.43330	9.97232	76	
25	9.53922	21	9.56693	23	0.43307	9.97229	75	
26	9.53943	20	9.56716	24	0.43284	9.97226	74	
27	9.53963	21	9.56740	23	0.43260	9.97224	73	
28	9.53984	20	9.56763	23	0.43237	9.97221	72	
29	9.54004	21	9.56786	24	0.43214	9.97218	71	21
30	9.54025	20	9.56810	23	0.43190	9.97215	70	1 2.1
31	9.54045	21	9.56833	23	0.43167	9.97212	69	2 4.2
32	9.54066	20	9.56856	24	0.43144	9.97210	68	3 6.3
33	9.54086	21	9.56880	23	0.43120	9.97207	67	4 8.4
34	9.54107	20	9.56903	23	0.43097	9.97204	66	5 10.5
35	9.54127	21	9.56926	23	0.43074	9.97201	65	6 12.6
36	9.54148	20	9.56949	24	0.43051	9.97198	64	7 14.7
37	9.54168	20	9.56973	23	0.43027	9.97195	63	8 16.8
38	9.54188	21	9.56996	23	0.43004	9.97193	62	9 18.9
39	9.54209	20	9.57019	23	0.42981	9.97190	61	
40	9.54229	21	9.57042	23	0.42958	9.97187	60	20
41	9.54250	20	9.57065	24	0.42935	9.97184	59	1 2.0
42	9.54270	20	9.57089	23	0.42911	9.97181	58	2 4.0
43	9.54290	21	9.57112	23	0.42888	9.97179	57	3 6.0
44	9.54311	20	9.57135	23	0.42865	9.97176	56	4 8.0
45	9.54331	20	9.57158	23	0.42842	9.97173	55	5 10.0
46	9.54351	21	9.57181	23	0.42819	9.97170	54	6 12.0
47	9.54372	20	9.57204	24	0.42796	9.97167	53	7 14.0
48	9.54392	20	9.57228	23	0.42772	9.97164	52	8 16.0
49	9.54412	21	9.57251	23	0.42749	9.97162	51	9 18.0
50	9.54433		9.57274		0.42726	9.97159	50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
69°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

20°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.		Prop. Pts.
50	9. 54433	20	9. 57274	23	0. 42726	9. 97159	50	
51	9. 54453	20	9. 57297	23	0. 42703	9. 97156	49	
52	9. 54473	20	9. 57320	23	0. 42680	9. 97153	48	
53	9. 54493	21	9. 57343	23	0. 42657	9. 97150	47	23
54	9. 54514	20	9. 57366	23	0. 42634	9. 97147	46	1 2. 3
55	9. 54534	20	9. 57389	23	0. 42611	9. 97145	45	2 4. 6
56	9. 54554	20	9. 57412	23	0. 42588	9. 97142	44	3 6. 9
57	9. 54574	20	9. 57435	23	0. 42565	9. 97139	43	4 9. 2
58	9. 54594	21	9. 57458	23	0. 42542	9. 97136	42	5 11. 5
59	9. 54615	20	9. 57481	23	0. 42519	9. 97133	41	6 13. 8
60	9. 54635	20	9. 57504	23	0. 42496	9. 97130	40	7 16. 1 8 18. 4 9 20. 7
61	9. 54655	20	9. 57527	23	0. 42473	9. 97127	39	
62	9. 54675	20	9. 57550	23	0. 42450	9. 97125	38	
63	9. 54695	20	9. 57573	23	0. 42427	9. 97122	37	
64	9. 54715	20	9. 57596	23	0. 42404	9. 97119	36	22
65	9. 54735	21	9. 57619	23	0. 42381	9. 97116	35	1 2. 2
66	9. 54756	20	9. 57642	23	0. 42358	9. 97113	34	2 4. 4
67	9. 54776	20	9. 57665	23	0. 42335	9. 97110	33	3 6. 6 4 8. 8
68	9. 54796	20	9. 57688	23	0. 42312	9. 97108	32	5 11. 0
69	9. 54816	20	9. 57711	23	0. 42289	9. 97105	31	6 13. 2
70	9. 54836	20	9. 57734	23	0. 42266	9. 97102	30	7 15. 4 8 17. 6 9 19. 8
71	9. 54856	20	9. 57757	23	0. 42243	9. 97099	29	
72	9. 54876	20	9. 57780	23	0. 42220	9. 97096	28	
73	9. 54896	20	9. 57803	23	0. 42197	9. 97093	27	
74	9. 54916	20	9. 57826	23	0. 42174	9. 97090	26	
75	9. 54936	20	9. 57849	22	0. 42151	9. 97087	25	
76	9. 54956	20	9. 57871	23	0. 42129	9. 97085	24	
77	9. 54976	20	9. 57894	23	0. 42106	9. 97082	23	
78	9. 54996	20	9. 57917	23	0. 42083	9. 97079	22	
79	9. 55016	20	9. 57940	23	0. 42060	9. 97076	21	20
80	9. 55036	20	9. 57963	23	0. 42037	9. 97073	20	1 2. 0 2 4. 0 3 6. 0
81	9. 55056	20	9. 57986	23	0. 42014	9. 97070	19	4 8. 0
82	9. 55076	20	9. 58009	22	0. 41991	9. 97067	18	5 10. 0
83	9. 55096	20	9. 58031	23	0. 41969	9. 97064	17	6 12. 0 7 14. 0
84	9. 55116	20	9. 58054	23	0. 41946	9. 97062	16	8 16. 0
85	9. 55136	19	9. 58077	23	0. 41923	9. 97059	15	9 18. 0
86	9. 55155	20	9. 58100	22	0. 41900	9. 97056	14	
87	9. 55175	20	9. 58122	23	0. 41878	9. 97053	13	
88	9. 55195	20	9. 58145	23	0. 41855	9. 97050	12	
89	9. 55215	20	9. 58168	23	0. 41832	9. 97047	11	19
90	9. 55235	20	9. 58191	22	0. 41809	9. 97044	10	1 1. 9 2 3. 8
91	9. 55255	20	9. 58213	23	0. 41787	9. 97041	09	3 5. 7
92	9. 55275	19	9. 58236	23	0. 41764	9. 97038	08	4 7. 6
93	9. 55294	20	9. 58259	23	0. 41741	9. 97036	07	5 9. 5 6 11. 4
94	9. 55314	20	9. 58282	22	0. 41718	9. 97033	06	7 13. 3
95	9. 55334	20	9. 58304	23	0. 41696	9. 97030	05	8 15. 2
96	9. 55354	20	9. 58327	23	0. 41673	9. 97027	04	9 17. 1
97	9. 55374	19	9. 58350	22	0. 41650	9. 97024	03	
98	9. 55393	20	9. 58372	23	0. 41628	9. 97021	02	
99	9. 55413	20	9. 58395	23	0. 41605	9. 97018	01	
100	9. 55433		9. 58418		0. 41582	9. 97015	00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.		Prop. Pts.
69°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
				21°					
00	9. 55433	20	9. 58418	22	0. 41582	9. 97015	3	100	
01	9. 55453	19	9. 58440	23	0. 41560	9. 97012	3	99	23
02	9. 55472	20	9. 58463	23	0. 41537	9. 97009	3	98	1 | 2. 3
03	9. 55492	20	9. 58486	22	0. 41514	9. 97006	2	97	2 | 4. 6
04	9. 55512	20	9. 58508	23	0. 41492	9. 97004	3	96	3 | 6. 9
05	9. 55532	19	9. 58531	23	0. 41469	9. 97001	3	95	4 | 9. 2
06	9. 55551	20	9. 58554	22	0. 41446	9. 96998	3	94	5 | 11. 5
07	9. 55571	20	9. 58576	23	0. 41424	9. 96995	3	93	6 | 13. 8
08	9. 55591	19	9. 58599	22	0. 41401	9. 96992	3	92	7 | 16. 1
09	9. 55610	20	9. 58621	23	0. 41379	9. 96989	3	91	8 | 18. 4
10	9. 55630	20	9. 58644	22	0. 41356	9. 96986	3	90	9 | 20. 7
11	9. 55650	19	9. 58666	23	0. 41334	9. 96983	3	89	22
12	9. 55669	20	9. 58689	23	0. 41311	9. 96980	3	88	1 | 2. 2
13	9. 55689	19	9. 58712	22	0. 41288	9. 96977	3	87	2 | 4. 4
14	9. 55708	20	9. 58734	23	0. 41266	9. 96974	3	86	3 | 6. 6
15	9. 55728	20	9. 58757	22	0. 41243	9. 96971	3	85	4 | 8. 8
16	9. 55748	19	9. 58779	23	0. 41221	9. 96968	3	84	5 | 11. 0
17	9. 55767	20	9. 58802	22	0. 41198	9. 96965	2	83	6 | 13. 2
18	9. 55787	19	9. 58824	23	0. 41176	9. 96963	3	82	7 | 15. 4
19	9. 55806	20	9. 58847	22	0. 41153	9. 96960	3	81	8 | 17. 6
20	9. 55826	19	9. 58869	23	0. 41131	9. 96957	3	80	9 | 19. 8
21	9. 55845	20	9. 58892	22	0. 41108	9. 96954	3	79	20
22	9. 55865	19	9. 58914	23	0. 41086	9. 96951	3	78	1 | 2. 0
23	9. 55884	20	9. 58937	22	0. 41063	9. 96948	3	77	2 | 4. 0
24	9. 55904	19	9. 58959	22	0. 41041	9. 96945	3	76	3 | 6. 0
25	9. 55923	20	9. 58981	23	0. 41019	9. 96942	3	75	4 | 8. 0
26	9. 55943	19	9. 59004	22	0. 40996	9. 96939	3	74	5 | 10. 0
27	9. 55962	20	9. 59026	23	0. 40974	9. 96936	3	73	6 | 12. 0
28	9. 55982	19	9. 59049	22	0. 40951	9. 96933	3	72	7 | 14. 0
29	9. 56001	20	9. 59071	23	0. 40929	9. 96930	3	71	8 | 16. 0
30	9. 56021	19	9. 59094	22	0. 40906	9. 96927	3	70	9 | 18. 0
31	9. 56040	20	9. 59116	22	0. 40884	9. 96924	3	69	19
32	9. 56060	19	9. 59138	23	0. 40862	9. 96921	3	68	1 | 1. 9
33	9. 56079	19	9. 59161	22	0. 40839	9. 96918	3	67	2 | 3. 8
34	9. 56098	20	9. 59183	22	0. 40817	9. 96915	3	66	3 | 5. 7
35	9. 56118	19	9. 59205	23	0. 40795	9. 96912	3	65	4 | 7. 6
36	9. 56137	20	9. 59228	22	0. 40772	9. 96909	3	64	5 | 9. 5
37	9. 56157	19	9. 59250	22	0. 40750	9. 96906	2	63	6 | 11. 4
38	9. 56176	19	9. 59272	23	0. 40728	9. 96904	3	62	7 | 13. 3
39	9. 56195	20	9. 59295	22	0. 40705	9. 96901	3	61	8 | 15. 2
40	9. 56215	19	9. 59317	22	0. 40683	9. 96898	3	60	9 | 17. 1
41	9. 56234	19	9. 59339	23	0. 40661	9. 96895	3	59	*
42	9. 56253	20	9. 59362	22	0. 40638	9. 96892	3	58	3
43	9. 56273	19	9. 59384	22	0. 40616	9. 96889	3	57	1 | 0. 3
44	9. 56292	19	9. 59406	23	0. 40594	9. 96886	3	56	2 | 0. 6
45	9. 56311	19	9. 59429	22	0. 40571	9. 96883	3	55	3 | 0. 9
46	9. 56330	20	9. 59451	22	0. 40549	9. 96880	3	54	4 | 1. 2
47	9. 56350	19	9. 59473	22	0. 40527	9. 96877	3	53	5 | 1. 5
48	9. 56369	19	9. 59495	23	0. 40505	9. 96874	3	52	6 | 1. 8
49	9. 56388	20	9. 59518	22	0. 40482	9. 96871	3	51	7 | 2. 1
50	9. 56408		9. 59540		0. 40460	9. 96868		50	8 | 2. 4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		9 | 2. 7
				68°					Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

21°									
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9. 56408	19	9. 59540	22	0. 40460	9. 96868	3	50	
51	9. 56427	19	9. 59562	22	0. 40438	9. 96865	3	49	22
52	9. 56446	19	9. 59584	22	0. 40416	9. 96862	3	48	1 | 2. 2
53	9. 56465	19	9. 59606	23	0. 40394	9. 96859	3	47	2 | 4. 4
54	9. 56484	20	9. 59629	22	0. 40371	9. 96856	3	46	3 | 6. 6
55	9. 56504	19	9. 59651	22	0. 40349	9. 96853	3	45	4 | 8. 8
56	9. 56523	19	9. 59673	22	0. 40327	9. 96850	3	44	5 | 11. 0
57	9. 56542	19	9. 59695	22	0. 40305	9. 96847	3	43	6 | 13. 2
58	9. 56561	19	9. 59717	22	0. 40283	9. 96844	3	42	7 | 15. 4
59	9. 56580	19	9. 59739	23	0. 40261	9. 96841	3	41	8 | 17. 6
60	9. 56599	20	9. 59762	22	0. 40238	9. 96838	3	40	9 | 19. 8
61	9. 56619	19	9. 59784	22	0. 40216	9. 96835	3	39	21
62	9. 56638	19	9. 59806	22	0. 40194	9. 96832	3	38	1 | 2. 1
63	9. 56657	19	9. 59828	22	0. 40172	9. 96829	3	37	2 | 4. 2
64	9. 56676	19	9. 59850	22	0. 40150	9. 96826	3	36	3 | 6. 3
65	9. 56695	19	9. 59872	22	0. 40128	9. 96823	3	35	4 | 8. 4
66	9. 56714	19	9. 59894	22	0. 40106	9. 96820	3	34	5 | 10. 5
67	9. 56733	19	9. 59916	23	0. 40084	9. 96817	3	33	6 | 12. 6
68	9. 56752	19	9. 59939	22	0. 40061	9. 96814	3	32	7 | 14. 7
69	9. 56771	19	9. 59961	22	0. 40039	9. 96811	3	31	8 | 16. 8
70	9. 56790	19	9. 59983	22	0. 40017	9. 96808	3	30	9 | 18. 9
71	9. 56809	20	9. 60005	22	0. 39995	9. 96805	3	29	19
72	9. 56829	19	9. 60027	22	0. 39973	9. 96802	3	28	1 | 1. 9
73	9. 56848	19	9. 60049	22	0. 39951	9. 96799	3	27	2 | 3. 8
74	9. 56867	19	9. 60071	22	0. 39929	9. 96796	3	26	3 | 5. 7
75	9. 56886	19	9. 60093	22	0. 39907	9. 96793	3	25	4 | 7. 6
76	9. 56905	19	9. 60115	22	0. 39885	9. 96790	3	24	5 | 9. 5
77	9. 56924	19	9. 60137	22	0. 39863	9. 96787	3	23	6 | 11. 4
78	9. 56943	19	9. 60159	22	0. 39841	9. 96784	3	22	7 | 13. 3
79	9. 56961	18	9. 60181	22	0. 39819	9. 96781	3	21	8 | 15. 2
80	9. 56980	19	9. 60203	22	0. 39797	9. 96778	4	20	9 | 17. 1
81	9. 56999	19	9. 60225	22	0. 39775	9. 96774	3	19	18
82	9. 57018	19	9. 60247	22	0. 39753	9. 96771	3	18	1 | 1. 8
83	9. 57037	19	9. 60269	22	0. 39731	9. 96768	3	17	2 | 3. 6
84	9. 57056	19	9. 60291	22	0. 39709	9. 96765	3	16	3 | 5. 4
85	9. 57075	19	9. 60313	22	0. 39687	9. 96762	3	15	4 | 7. 2
86	9. 57094	19	9. 60335	22	0. 39665	9. 96759	3	14	5 | 9. 0
87	9. 57113	19	9. 60357	22	0. 39643	9. 96756	3	13	6 | 10. 8
88	9. 57132	19	9. 60379	21	0. 39621	9. 96753	3	12	7 | 12. 6
89	9. 57151	18	9. 60400	22	0. 39600	9. 96750	3	11	8 | 14. 4
90	9. 57169	19	9. 60422	22	0. 39578	9. 96747	3	10	9 | 16. 2
91	9. 57188	19	9. 60444	22	0. 39556	9. 96744	3	09	4
92	9. 57207	19	9. 60466	22	0. 39534	9. 96741	3	08	
93	9. 57226	19	9. 60488	22	0. 39512	9. 96738	3	07	1 | 0. 4
94	9. 57245	19	9. 60510	22	0. 39490	9. 96735	3	06	2 | 0. 8
95	9. 57264	18	9. 60532	22	0. 39468	9. 96732	3	05	3 | 1. 2
96	9. 57282	19	9. 60554	21	0. 39446	9. 96729	3	04	4 | 1. 6
97	9. 57301	19	9. 60575	22	0. 39425	9. 96726	3	03	5 | 2. 0
98	9. 57320	19	9. 60597	22	0. 39403	9. 96723	3	02	6 | 2. 4
99	9. 57339	19	9. 60619	22	0. 39381	9. 96720	3	01	7 | 2. 8
100	9. 57358		9. 60641		0. 39359	9. 96717		00	8 | 3. 2
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		9 | 3. 6
									Prop. Pts.
68°									

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TABLE LII.—*Common logarithms of circular functions*—Continued

22°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9. 57358	18	9. 60641	22	0. 39359	9. 96717	3	100	
01	9. 57376	19	9. 60663	22	0. 39337	9. 96714	4	99	22
02	9. 57395	19	9. 60685	21	0. 39315	9. 96710	3	98	1 | 2. 2
03	9. 57414	19	9. 60706	22	0. 39294	9. 96707	3	97	2 | 4. 4
04	9. 57433	18	9. 60728	22	0. 39272	9. 96704	3	96	3 | 6. 6
05	9. 57451	19	9. 60750	22	0. 39250	9. 96701	3	95	4 | 8. 8
06	9. 57470	19	9. 60772	22	0. 39228	9. 96698	3	94	5 | 11. 0
07	9. 57489	18	9. 60794	21	0. 39206	9. 96695	3	93	6 | 13. 2
08	9. 57507	19	9. 60815	22	0. 39185	9. 96692	3	92	7 | 15. 4
09	9. 57526	19	9. 60837	22	0. 39163	9. 96689	3	91	8 | 17. 6
10	9. 57545	18	9. 60859	22	0. 39141	9. 96686	3	90	9 | 19. 8
11	9. 57563	19	9. 60881	21	0. 39119	9. 96683	3	89	21
12	9. 57582	19	9. 60902	22	0. 39098	9. 96680	3	88	1 | 2. 1
13	9. 57601	18	9. 60924	22	0. 39076	9. 96677	3	87	2 | 4. 2
14	9. 57619	19	9. 60946	21	0. 39054	9. 96674	4	86	3 | 6. 3
15	9. 57638	19	9. 60967	22	0. 39033	9. 96670	3	85	4 | 8. 4
16	9. 57657	18	9. 60989	22	0. 39011	9. 96667	3	84	5 | 10. 5
17	9. 57675	19	9. 61011	22	0. 38989	9. 96664	3	83	6 | 12. 6
18	9. 57694	18	9. 61033	21	0. 38967	9. 96661	3	82	7 | 14. 7
19	9. 57712	19	9. 61054	22	0. 38946	9. 96658	3	81	8 | 16. 8
20	9. 57731	18	9. 61076	22	0. 38924	9. 96655	3	80	9 | 18. 9
21	9. 57749	19	9. 61098	21	0. 38902	9. 96652	3	79	19
22	9. 57768	19	9. 61119	22	0. 38881	9. 96649	3	78	1 | 1. 9
23	9. 57787	18	9. 61141	21	0. 38859	9. 96646	3	77	2 | 3. 8
24	9. 57805	19	9. 61162	22	0. 38838	9. 96643	3	76	3 | 5. 7
25	9. 57824	18	9. 61184	22	0. 38816	9. 96640	4	75	4 | 7. 6
26	9. 57842	19	9. 61206	21	0. 38794	9. 96636	3	74	5 | 9. 5
27	9. 57861	18	9. 61227	22	0. 38773	9. 96633	3	73	6 | 11. 4
28	9. 57879	19	9. 61249	22	0. 38751	9. 96630	3	72	7 | 13. 3
29	9. 57898	18	9. 61271	21	0. 38729	9. 96627	3	71	8 | 15. 2
30	9. 57916	19	9. 61292	22	0. 38708	9. 96624	3	70	9 | 17. 1
31	9. 57935	18	9. 61314	21	0. 38686	9. 96621	3	69	18
32	9. 57953	19	9. 61335	22	0. 38665	9. 96618	3	68	1 | 1. 8
33	9. 57972	18	9. 61357	21	0. 38643	9. 96615	3	67	2 | 3. 6
34	9. 57990	18	9. 61378	22	0. 38622	9. 96612	4	66	3 | 5. 4
35	9. 58008	19	9. 61400	22	0. 38600	9. 96608	3	65	4 | 7. 2
36	9. 58027	18	9. 61422	21	0. 38578	9. 96605	3	64	5 | 9. 0
37	9. 58045	19	9. 61443	22	0. 38557	9. 96602	3	63	6 | 10. 8
38	9. 58064	18	9. 61465	21	0. 38535	9. 96599	3	62	7 | 12. 6
39	9. 58082	19	9. 61486	22	0. 38514	9. 96596	3	61	8 | 14. 4
40	9. 58101	18	9. 61508	21	0. 38492	9. 96593	3	60	9 | 16. 2
41	9. 58119	18	9. 61529	22	0. 38471	9. 96590	3	59	3
42	9. 58137	19	9. 61551	21	0. 38449	9. 96587	4	58	1 | 0. 3
43	9. 58156	18	9. 61572	22	0. 38428	9. 96583	3	57	2 | 0. 6
44	9. 58174	18	9. 61594	21	0. 38406	9. 96580	3	56	3 | 0. 9
45	9. 58192	19	9. 61615	22	0. 38385	9. 96577	3	55	4 | 1. 2
46	9. 58211	18	9. 61637	21	0. 38363	9. 96574	3	54	5 | 1. 5
47	9. 58229	18	9. 61658	22	0. 38342	9. 96571	3	53	6 | 1. 8
48	9. 58247	19	9. 61680	21	0. 38320	9. 96568	3	52	7 | 2. 1
49	9. 58266	18	9. 61701	21	0. 38299	9. 96565	3	51	8 | 2. 4
50	9. 58284		9. 61722		0. 38278	9. 96562		50	9 | 2. 7
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

22°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9. 58284	18	9. 61722	22	0. 38278	9. 96562	4	50	
51	9. 58302	19	9. 61744	21	0. 38256	9. 96558	3	49	22
52	9. 58321	18	9. 61765	22	0. 38235	9. 96555	3	48	1 2. 2
53	9. 58339	18	9. 61787	21	0. 38213	9. 96552	3	47	2 4. 4
54	9. 58357	18	9. 61808	22	0. 38192	9. 96549	3	46	3 6. 6
55	9. 58375	19	9. 61830	21	0. 38170	9. 96546	3	45	4 8. 8
56	9. 58394	18	9. 61851	21	0. 38149	9. 96543	3	44	5 11. 0
57	9. 58412	18	9. 61872	22	0. 38128	9. 96540	4	43	6 13. 2
58	9. 58430	18	9. 61894	21	0. 38106	9. 96536	3	42	7 15. 4
59	9. 58448	19	9. 61915	21	0. 38085	9. 96533	3	41	8 17. 6
60	9. 58467	18	9. 61936	22	0. 38064	9. 96530	3	40	9 19. 8
61	9. 58485	18	9. 61958	21	0. 38042	9. 96527	3	39	21
62	9. 58503	18	9. 61979	22	0. 38021	9. 96524	3	38	1 2. 1
63	9. 58521	18	9. 62001	21	0. 37999	9. 96521	4	37	2 4. 2
64	9. 58539	18	9. 62022	21	0. 37978	9. 96517	3	36	3 6. 3
65	9. 58557	19	9. 62043	22	0. 37957	9. 96514	3	35	4 8. 4
66	9. 58576	18	9. 62065	21	0. 37935	9. 96511	3	34	5 10. 5
67	9. 58594	18	9. 62086	21	0. 37914	9. 96508	3	33	6 12. 6
68	9. 58612	18	9. 62107	21	0. 37893	9. 96505	3	32	7 14. 7
69	9. 58630	18	9. 62128	22	0. 37872	9. 96502	4	31	8 16. 8
70	9. 58648	18	9. 62150	21	0. 37850	9. 96498	3	30	9 18. 9
71	9. 58666	18	9. 62171	21	0. 37829	9. 96495	3	29	18
72	9. 58684	18	9. 62192	22	0. 37808	9. 96492	3	28	1 1. 8
73	9. 58702	19	9. 62214	21	0. 37786	9. 96489	3	27	2 3. 6
74	9. 58721	18	9. 62235	21	0. 37765	9. 96486	3	26	3 5. 4
75	9. 58739	18	9. 62256	21	0. 37744	9. 96483	4	25	4 7. 2
76	9. 58757	18	9. 62277	22	0. 37723	9. 96479	3	24	5 9. 0
77	9. 58775	18	9. 62299	21	0. 37701	9. 96476	3	23	6 10. 8
78	9. 58793	18	9. 62320	21	0. 37680	9. 96473	3	22	7 12. 6
79	9. 58811	18	9. 62341	21	0. 37659	9. 96470	3	21	8 14. 4
80	9. 58829	18	9. 62362	21	0. 37638	9. 96467	4	20	9 16. 2
81	9. 58847	18	9. 62383	22	0. 37617	9. 96463	3	19	17
82	9. 58865	18	9. 62405	21	0. 37595	9. 96460	3	18	1 1. 7
83	9. 58883	18	9. 62426	21	0. 37574	9. 96457	3	17	2 3. 4
84	9. 58901	18	9. 62447	21	0. 37553	9. 96454	3	16	3 5. 1
85	9. 58919	18	9. 62468	21	0. 37532	9. 96451	4	15	4 6. 8
86	9. 58937	18	9. 62489	22	0. 37511	9. 96447	3	14	5 8. 5
87	9. 58955	18	9. 62511	21	0. 37489	9. 96444	3	13	6 10. 2
88	9. 58973	18	9. 62532	21	0. 37468	9. 96441	3	12	7 11. 9
89	9. 58991	18	9. 62553	21	0. 37447	9. 96438	3	11	8 13. 6
90	9. 59009	18	9. 62574	21	0. 37426	9. 96435	3	10	9 15. 3
91	9. 59027	18	9. 62595	21	0. 37405	9. 96432	4	09	4
92	9. 59045	18	9. 62616	21	0. 37384	9. 96428	3	08	1 0. 4
93	9. 59063	18	9. 62637	22	0. 37363	9. 96425	3	07	2 0. 8
94	9. 59081	17	9. 62659	21	0. 37341	9. 96422	3	06	3 1. 2
95	9. 59098	18	9. 62680	21	0. 37320	9. 96419	4	05	4 1. 6
96	9. 59116	18	9. 62701	21	0. 37299	9. 96415	3	04	5 2. 0
97	9. 59134	18	9. 62722	21	0. 37278	9. 96412	3	03	6 2. 4
98	9. 59152	18	9. 62743	21	0. 37257	9. 96409	3	02	7 2. 8
99	9. 59170	18	9. 62764	21	0. 37236	9. 96406	3	01	8 3. 2
100	9. 59188		9. 62785		0. 37215	9. 96403		00	9 3. 6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

23°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9. 59188	18	9. 62785	21	0. 37215	9. 96403	4	100	
01	9. 59206	17	9. 62806	21	0. 37194	9. 96399	3	99	21
02	9. 59223	18	9. 62827	21	0. 37173	9. 96396	3	98	1 | 2. 1
03	9. 59241	18	9. 62848	21	0. 37152	9. 96393	3	97	2 | 4. 2
04	9. 59259	18	9. 62869	21	0. 37131	9. 96390	3	96	3 | 6. 3
05	9. 59277	18	9. 62890	22	0. 37110	9. 96387	4	95	4 | 8. 4
06	9. 59295	18	9. 62912	21	0. 37088	9. 96383	3	94	5 | 10. 5
07	9. 59313	17	9. 62933	21	0. 37067	9. 96380	3	93	6 | 12. 6
08	9. 59330	18	9. 62954	21	0. 37046	9. 96377	3	92	7 | 14. 7
09	9. 59348	18	9. 62975	21	0. 37025	9. 96374	4	91	8 | 16. 8
10	9. 59366	18	9. 62996	21	0. 37004	9. 96370	3	90	9 | 18. 9
11	9. 59384	17	9. 63017	21	0. 36983	9. 96367	3	89	20
12	9. 59401	18	9. 63038	21	0. 36962	9. 96364	3	88	1 | 2. 0
13	9. 59419	18	9. 63059	21	0. 36941	9. 96361	4	87	2 | 4. 0
14	9. 59437	18	9. 63080	21	0. 36920	9. 96357	3	86	3 | 6. 0
15	9. 59455	17	9. 63101	20	0. 36899	9. 96354	3	85	4 | 8. 0
16	9. 59472	18	9. 63121	21	0. 36879	9. 96351	3	84	5 | 10. 0
17	9. 59490	18	9. 63142	21	0. 36858	9. 96348	4	83	6 | 12. 0
18	9. 59508	18	9. 63163	21	0. 36837	9. 96344	3	82	7 | 14. 0
19	9. 59526	17	9. 63184	21	0. 36816	9. 96341	3	81	8 | 16. 0
20	9. 59543	18	9. 63205	21	0. 36795	9. 96338	3	80	9 | 18. 0
21	9. 59561	18	9. 63226	21	0. 36774	9. 96335	4	79	18
22	9. 59579	17	9. 63247	21	0. 36753	9. 96331	3	78	1 | 1. 8
23	9. 59596	18	9. 63268	21	0. 36732	9. 96328	3	77	2 | 3. 6
24	9. 59614	18	9. 63289	21	0. 36711	9. 96325	3	76	3 | 5. 4
25	9. 59632	17	9. 63310	21	0. 33690	9. 96322	4	75	4 | 7. 2
26	9. 59649	18	9. 63331	21	0. 36669	9. 96318	3	74	5 | 9. 0
27	9. 59667	17	9. 63352	21	0. 36648	9. 96315	3	73	6 | 10. 8
28	9. 59684	18	9. 63373	20	0. 36627	9. 96312	3	72	7 | 12. 6
29	9. 59702	18	9. 63393	21	0. 36607	9. 96309	4	71	8 | 14. 4
30	9. 59720	17	9. 63414	21	0. 36586	9. 96305	3	70	9 | 16. 2
31	9. 59737	18	9. 63435	21	0. 36565	9. 96302	3	69	17
32	9. 59755	17	9. 63456	21	0. 36544	9. 96299	3	68	1 | 1. 7
33	9. 59772	18	9. 63477	21	0. 36523	9. 96296	4	67	2 | 3. 4
34	9. 59790	18	9. 63498	21	0. 36502	9. 96292	3	66	3 | 5. 1
35	9. 59808	17	9. 63519	20	0. 36481	9. 96289	3	65	4 | 6. 8
36	9. 59825	18	9. 63539	21	0. 36461	9. 96286	4	64	5 | 8. 5
37	9. 59843	17	9. 63560	21	0. 36440	9. 96282	3	63	6 | 10. 2
38	9. 59860	18	9. 63581	21	0. 36419	9. 96279	3	62	7 | 11. 9
39	9. 59878	17	9. 63602	21	0. 36398	9. 96276	3	61	8 | 13. 6
40	9. 59895	18	9. 63623	20	0. 36377	9. 96273	4	60	9 | 15. 3
41	9. 59913	17	9. 63643	21	0. 36357	9. 96269	3	59	3
42	9. 59930	18	9. 63664	21	0. 36336	9. 96266	3	58	1 | 0. 3
43	9. 59948	17	9. 63685	21	0. 36315	9. 96263	3	57	2 | 0. 6
44	9. 59965	18	9. 63706	20	0. 36294	9. 96260	4	56	3 | 0. 9
45	9. 59983	17	9. 63726	21	0. 36274	9. 96256	3	55	4 | 1. 2
46	9. 60000	18	9. 63747	21	0. 36253	9. 96253	3	54	5 | 1. 5
47	9. 60018	17	9. 63768	21	0. 36232	9. 96250	4	53	6 | 1. 8
48	9. 60035	18	9. 63789	20	0. 36211	9. 96246	3	52	7 | 2. 1
49	9. 60053	17	9. 63809	21	0. 36191	9. 96243	3	51	8 | 2. 4
50	9. 60070		9. 63830		0. 36170	9. 96240		50	9 | 2. 7
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

23°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.	
50	9. 60070	17	9. 63830	21	0. 36170	9. 96240	4	50
51	9. 60087	18	9. 63851	21	0. 36149	9. 96236	3	49
52	9. 60105	17	9. 63872	20	0. 36128	9. 96233	3	48
53	9. 60122	18	9. 63892	21	0. 36108	9. 96230	3	47
54	9. 60140	17	9. 63913	21	0. 36087	9. 96227	4	46
55	9. 60157	17	9. 63934	20	0. 36066	9. 96223	3	45
56	9. 60174	18	9. 63954	21	0. 36046	9. 96220	3	44
57	9. 60192	17	9. 63975	21	0. 36025	9. 96217	4	43
58	9. 60209	18	9. 63996	20	0. 36004	9. 96213	3	42
59	9. 60227	17	9. 64016	21	0. 35984	9. 96210	3	41
60	9. 60244	17	9. 64037	21	0. 35963	9. 96207	4	40
61	9. 60261	18	9. 64058	20	0. 35942	9. 96203	3	39
62	9. 60279	17	9. 64078	21	0. 35922	9. 96200	3	38
63	9. 60296	17	9. 64099	21	0. 35901	9. 96197	4	37
64	9. 60313	18	9. 64120	20	6. 35880	9. 96193	3	36
65	9. 60331	17	9. 64140	21	0. 35860	9. 96190	3	35
66	9. 60348	17	9. 64161	21	0. 35839	9. 96187	3	34
67	9. 60365	17	9. 64182	20	0. 35818	9. 96184	4	33
68	9. 60382	18	9. 64202	21	0. 35798	9. 96180	3	32
69	9. 60400	17	9. 64223	20	0. 35777	9. 96177	3	31
70	9. 60417	17	9. 64243	21	0. 35757	9. 96174	4	30
71	9. 60434	17	9. 64264	21	0. 35736	9. 96170	3	29
72	9. 60451	18	9. 64285	20	0. 35715	9. 96167	3	28
73	9. 60469	17	9. 64305	21	0. 35695	9. 96164	4	27
74	9. 60486	17	9. 64326	20	0. 35674	9. 96160	3	26
75	9. 60503	17	9. 64346	21	0. 35654	9. 96157	3	25
76	9. 60520	18	9. 64367	20	0. 35633	9. 96154	4	24
77	9. 60538	17	9. 64387	21	0. 35613	9. 96150	3	23
78	9. 60555	17	9. 64408	21	0. 35592	9. 96147	3	22
79	9. 60572	17	9. 64429	20	0. 35571	9. 96144	4	21
80	9. 60589	17	9. 64449	21	0. 35551	9. 96140	3	20
81	9. 60606	18	9. 64470	20	0. 35530	9. 96137	3	19
82	9. 60624	17	9. 64490	21	0. 35510	9. 96134	4	18
83	9. 60641	17	9. 64511	20	0. 35489	9. 96130	3	17
84	9. 60658	17	9. 64531	21	0. 35469	9. 96127	4	16
85	9. 60675	17	9. 64552	20	0. 35448	9. 96123	3	15
86	9. 60692	17	9. 64572	21	0. 35428	9. 96120	3	14
87	9. 60709	17	9. 64593	20	0. 35407	9. 96117	4	13
88	9. 60726	18	9. 64613	21	0. 35387	9. 96113	3	12
89	9. 60744	17	9. 64634	20	0. 35366	9. 96110	3	11
90	9. 60761	17	9. 64654	20	0. 35346	9. 96107	4	10
91	9. 60778	17	9. 64674	21	0. 35326	9. 96103	3	09
92	9. 60795	17	9. 64695	20	0. 35305	9. 96100	3	08
93	9. 60812	17	9. 64715	21	0. 35285	9. 96097	4	07
94	9. 60829	17	9. 64736	20	0. 35264	9. 96093	3	06
95	9. 60846	17	9. 64756	21	0. 35244	9. 96090	3	05
96	9. 60863	17	9. 64777	20	0. 35223	9. 96087	4	04
97	9. 60880	17	9. 64797	21	0. 35203	9. 96083	3	03
98	9. 60897	17	9. 64818	20	0. 35182	9. 96080	4	02
99	9. 60914	17	9. 64838	20	0. 35162	9. 96076	3	01
100	9. 60931		9. 64858		0. 35142	9. 96073		00
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.	
66°								

Prop. Pts.	
	21
1	2. 1
2	4. 2
3	6. 3
4	8. 4
5	10. 5
6	12. 6
7	14. 7
8	16. 8
9	18. 9
	20
1	2. 0
2	4. 0
3	6. 0
4	8. 0
5	10. 0
6	12. 0
7	14. 0
8	16. 0
9	18. 0
	18
1	1. 8
2	3. 6
3	5. 4
4	7. 2
5	9. 0
6	10. 8
7	12. 6
8	14. 4
9	16. 2
	17
1	1. 7
2	3. 4
3	5. 1
4	6. 8
5	8. 5
6	10. 2
7	11. 9
8	13. 6
9	15. 3
	4
1	0. 4
2	0. 8
3	1. 2
4	1. 6
5	2. 0
6	2. 4
7	2. 8
8	3. 2
9	3. 6

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					24°				
00	9.60931	17	9.64858	21	0.35142	9.96073	3	100	
01	9.60948	17	9.64879	20	0.35121	9.96070	4	99	21
02	9.60965	17	9.64899	20	0.35101	9.96066	3	98	1 2.1
03	9.60982	17	9.64919	21	0.35081	9.96063	3	97	2 4.2
04	9.60999	17	9.64940	20	0.35060	9.96060	4	96	3 6.3
05	9.61016	17	9.64960	21	0.35040	9.96056	3	95	4 8.4
06	9.61033	17	9.64981	20	0.35019	9.96053	4	94	5 10.5
07	9.61050	17	9.65001	20	0.34999	9.96049	3	93	6 12.6
08	9.61067	17	9.65021	21	0.34979	9.96046	3	92	7 14.7
09	9.61084	17	9.65042	20	0.34958	9.96043	4	91	8 16.8
10	9.61101	17	9.65062	20	0.34938	9.96039	3	90	9 18.9
11	9.61118	17	9.65082	21	0.34918	9.96036	4	89	20
12	9.61135	17	9.65103	20	0.34897	9.96032	3	88	1 2.0
13	9.61152	17	9.65123	20	0.34877	9.96029	3	87	2 4.0
14	9.61169	17	9.65143	21	0.34857	9.96026	4	86	3 6.0
15	9.61186	17	9.65164	20	0.34836	9.96022	3	85	4 8.0
16	9.61203	17	9.65184	20	0.34816	9.96019	4	84	5 10.0
17	9.61220	16	9.65204	20	0.34796	9.96015	3	83	6 12.0
18	9.61236	17	9.65224	21	0.34776	9.96012	3	82	7 14.0
19	9.61253	17	9.65245	20	0.34755	9.96009	4	81	8 16.0
20	9.61270	17	9.65265	20	0.34735	9.96005	3	80	9 18.0
21	9.61287	17	9.65285	21	0.34715	9.96002	4	79	17
22	9.61304	17	9.65306	20	0.34694	9.95998	3	78	1 1.7
23	9.61321	17	9.65326	20	0.34674	9.95995	3	77	2 3.4
24	9.61338	16	9.65346	20	0.34654	9.95992	4	76	3 5.1
25	9.61354	17	9.65366	21	0.34634	9.95988	3	75	4 6.8
26	9.61371	17	9.65387	20	0.34613	9.95985	4	74	5 8.5
27	9.61388	17	9.65407	20	0.34593	9.95981	3	73	6 10.2
28	9.61405	17	9.65427	20	0.34573	9.95978	4	72	7 11.9
29	9.61422	16	9.65447	20	0.34553	9.95974	3	71	8 13.6
30	9.61438	17	9.65467	21	0.34533	9.95971	3	70	9 15.3
31	9.61455	17	9.65488	20	0.34512	9.95968	4	69	16
32	9.61472	17	9.65508	20	0.34492	9.95964	3	68	1 1.6
33	9.61489	17	9.65528	20	0.34472	9.95961	4	67	2 3.2
34	9.61506	16	9.65548	20	0.34452	9.95957	3	66	3 4.8
35	9.61522	17	9.65568	21	0.34432	9.95954	4	65	4 6.4
36	9.61539	17	9.65589	20	0.34411	9.95950	3	64	5 8.0
37	9.61556	17	9.65609	20	0.34391	9.95947	3	63	6 9.6
38	9.61573	16	9.65629	20	0.34371	9.95944	4	62	7 11.2
39	9.61589	17	9.65649	20	0.34351	9.95940	3	61	8 12.8
40	9.61606	17	9.65669	20	0.34331	9.95937	4	60	9 14.4
41	9.61623	16	9.65689	21	0.34311	9.95933	3	59	
42	9.61639	17	9.65710	20	0.34290	9.95930	4	58	3
43	9.61656	17	9.65730	20	0.34270	9.95926	3	57	1 0.3
44	9.61673	16	9.65750	20	0.34250	9.95923	3	56	2 0.6
45	9.61689	17	9.65770	20	0.34230	9.95920	4	55	3 0.9
46	9.61706	17	9.65790	20	0.34210	9.95916	3	54	4 1.2
47	9.61723	16	9.65810	20	0.34190	9.95913	4	53	5 1.5
48	9.61739	17	9.65830	20	0.34170	9.95909	3	52	6 1.8
49	9.61756	17	9.65850	20	0.34150	9.95906	4	51	7 2.1
50	9.61773		9.65870		0.34130	9.95902		50	8 2.4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		9 2.7
					65°				Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

24°									
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.61773	16	9.65870	20	0.34130	9.95902	3	50	
51	9.61789	17	9.65890	21	0.34110	9.95899	4	49	20
52	9.61806	17	9.65911	20	0.34089	9.95895	3	48	1 2.0
53	9.61823	16	9.65931	20	0.34069	9.95892	4	47	2 4.0
									3 6.0
54	9.61839	17	9.65951	20	0.34049	9.95888	3	46	4 8.0
55	9.61856	16	9.65971	20	0.34029	9.95885	3	45	5 10.0
56	9.61872	17	9.65991	20	0.34009	9.95882	4	44	6 12.0
									7 14.0
57	9.61889	17	9.66011	20	0.33989	9.95878	3	43	8 16.0
58	9.61906	16	9.66031	20	0.33969	9.95875	4	42	9 18.0
59	9.61922	17	9.66051	20	0.33949	9.95871	3	41	
60	9.61939	16	9.66071	20	0.33929	9.95868	4	40	
61	9.61955	17	9.66091	20	0.33909	9.95864	3	39	19
62	9.61972	16	9.66111	20	0.33889	9.95861	4	38	1 1.9
63	9.61988	17	9.66131	20	0.33869	9.95857	3	37	2 3.8
									3 5.7
64	9.62005	16	9.66151	20	0.33849	9.95854	4	36	4 7.6
65	9.62021	17	9.66171	20	0.33829	9.95850	3	35	5 9.5
66	9.62038	16	9.66191	20	0.33809	9.95847	4	34	6 11.4
									7 13.3
67	9.62054	17	9.66211	20	0.33789	9.95843	3	33	8 15.2
68	9.62071	16	9.66231	20	0.33769	9.95840	4	32	9 17.1
69	9.62087	17	9.66251	20	0.33749	9.95836	3	31	
70	9.62104	16	9.66271	20	0.33729	9.95833	4	30	
71	9.62120	17	9.66291	20	0.33709	9.95829	3	29	17
72	9.62137	16	9.66311	20	0.33689	9.95826	4	28	1 1.7
73	9.62153	17	9.66331	20	0.33669	9.95822	3	27	2 3.4
									3 5.1
74	9.62170	16	9.66351	20	0.33649	9.95819	4	26	4 6.8
75	9.62186	17	9.66371	20	0.33629	9.95815	3	25	5 8.5
76	9.62203	16	9.66391	20	0.33609	9.95812	4	24	6 10.2
									7 11.9
77	9.62219	16	9.66411	19	0.33589	9.95808	3	23	8 13.6
78	9.62235	17	9.66430	20	0.33570	9.95805	4	22	9 15.3
79	9.62252	16	9.66450	20	0.33550	9.95801	3	21	
80	9.62268	17	9.66470	20	0.33530	9.95798	4	20	
81	9.62285	16	9.66490	20	0.33510	9.95794	3	19	16
82	9.62301	16	9.66510	20	0.33490	9.95791	4	18	1 1.6
83	9.62317	17	9.66530	20	0.33470	9.95787	3	17	2 3.2
									3 4.8
84	9.62334	16	9.66550	20	0.33450	9.95784	4	16	4 6.4
85	9.62350	17	9.66570	20	0.33430	9.95780	3	15	5 8.0
86	9.62367	16	9.66590	19	0.33410	9.95777	4	14	6 9.6
									7 11.2
87	9.62383	16	9.66609	20	0.33391	9.95773	3	13	8 12.8
88	9.62399	17	9.66629	20	0.33371	9.95770	4	12	9 14.4
89	9.62416	16	9.66649	20	0.33351	9.95766	3	11	
90	9.62432	16	9.66669	20	0.33331	9.95763	4	10	
91	9.62448	17	9.66689	20	0.33311	9.95759	3	09	4
92	9.62465	16	9.66709	20	0.33291	9.95756	4	08	1 0.4
93	9.62481	16	9.66729	19	0.33271	9.95752	3	07	2 0.8
									3 1.2
94	9.62497	16	9.66748	20	0.33252	9.95749	4	06	4 1.6
95	9.62513	17	9.66768	20	0.33232	9.95745	3	05	5 2.0
96	9.62530	16	9.66788	20	0.33212	9.95742	4	04	6 2.4
									7 2.8
97	9.62546	16	9.66808	20	0.33192	9.95738	3	03	8 3.2
98	9.62562	17	9.66828	19	0.33172	9.95735	4	02	9 3.6
99	9.62579	16	9.66847	20	0.33153	9.95731	3	01	
100	9.62595		9.66867		0.33133	9.95728		00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
65°									

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TABLE LII.—*Common logarithms of circular functions*—Continued

25°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9. 62595	16	9. 66867	20	0. 33133	9. 95728	4	100	
01	9. 62611	16	9. 66887	20	0. 33113	9. 95724	4	99	
02	9. 62627	17	9. 66907	20	0. 33093	9. 95720	3	98	20
03	9. 62644	16	9. 66927	19	0. 33073	9. 95717	4	97	1 | 2. 0
04	9. 62660	16	9. 66946	20	0. 33054	9. 95713	3	96	2 | 4. 0
05	9. 62676	16	9. 66966	20	0. 33034	9. 95710	4	95	3 | 6. 0
06	9. 62692	16	9. 66986	20	0. 33014	9. 95706	3	94	4 | 8. 0
07	9. 62708	17	9. 67006	19	0. 32994	9. 95703	4	93	5 | 10. 0
08	9. 62725	16	9. 67025	20	0. 32975	9. 95699	3	92	6 | 12. 0
09	9. 62741	16	9. 67045	20	0. 32955	9. 95696	4	91	7 | 14. 0
10	9. 62757	16	9. 67065	20	0. 32935	9. 95692	3	90	8 | 16. 0
11	9. 62773	16	9. 67085	19	0. 32915	9. 95689	4	89	9 | 18. 0
12	9. 62789	17	9. 67104	20	0. 32896	9. 95685	4	88	
13	9. 62806	16	9. 67124	20	0. 32876	9. 95681	3	87	19
14	9. 62822	16	9. 67144	19	0. 32856	9. 95678	4	86	1 | 1. 9
15	9. 62838	16	9. 67163	20	0. 32837	9. 95674	3	85	2 | 3. 8
16	9. 62854	16	9. 67183	20	0. 32817	9. 95671	4	84	3 | 5. 7
17	9. 62870	16	9. 67203	20	0. 32797	9. 95667	3	83	4 | 7. 6
18	9. 62886	16	9. 67223	19	0. 32777	9. 95664	4	82	5 | 9. 5
19	9. 62902	16	9. 67242	20	0. 32758	9. 95660	3	81	6 | 11. 4
20	9. 62918	17	9. 67262	20	0. 32738	9. 95657	4	80	7 | 13. 3
21	9. 62935	16	9. 67282	19	0. 32718	9. 95653	4	79	8 | 15. 2
22	9. 62951	16	9. 67301	20	0. 32699	9. 95649	3	78	9 | 17. 1
23	9. 62967	16	9. 67321	20	0. 32679	9. 95646	4	77	
24	9. 62983	16	9. 67341	19	0. 32659	9. 95642	3	76	17
25	9. 62999	16	9. 67360	20	0. 32640	9. 95639	4	75	1 | 1. 7
26	9. 63015	16	9. 67380	19	0. 32626	9. 95635	3	74	2 | 3. 4
27	9. 63031	16	9. 67399	20	0. 32601	9. 95632	4	73	3 | 5. 1
28	9. 63047	16	9. 67419	20	0. 32581	9. 95628	4	72	4 | 6. 8
29	9. 63063	16	9. 67439	19	0. 32561	9. 95624	3	71	5 | 8. 5
30	9. 63079	16	9. 67458	20	0. 32542	9. 95621	4	70	6 | 10. 2
31	9. 63095	16	9. 67478	20	0. 32522	9. 95617	3	69	7 | 11. 9
32	9. 63111	16	9. 67498	19	0. 32502	9. 95614	4	68	8 | 13. 6
33	9. 63127	16	9. 67517	20	0. 32483	9. 95610	4	67	9 | 15. 3
34	9. 63143	16	9. 67537	19	0. 32463	9. 95606	3	66	
35	9. 63159	16	9. 67556	20	0. 32444	9. 95603	4	65	16
36	9. 63175	16	9. 67576	20	0. 32424	9. 95599	3	64	1 | 1. 6
37	9. 63191	16	9. 67596	19	0. 32404	9. 95596	4	63	2 | 3. 2
38	9. 63207	16	9. 67615	20	0. 32385	9. 95592	4	62	3 | 4. 8
39	9. 63223	16	9. 67635	19	0. 32365	9. 95588	3	61	4 | 6. 4
40	9. 63239	16	9. 67654	20	0. 32346	9. 95585	4	60	5 | 8. 0
41	9. 63255	16	9. 67674	19	0. 32326	9. 95581	3	59	6 | 9. 6
42	9. 63271	16	9. 67693	20	0. 32307	9. 95578	4	58	7 | 11. 2
43	9. 63287	16	9. 67713	19	0. 32287	9. 95574	4	57	8 | 12. 8
44	9. 63303	16	9. 67732	20	0. 32268	9. 95570	3	56	9 | 14. 4
45	9. 63319	16	9. 67752	20	0. 32248	9. 95567	4	55	
46	9. 63335	16	9. 67772	19	0. 32228	9. 95563	3	54	3
47	9. 63351	16	9. 67791	20	0. 32209	9. 95560	4	53	1 | 0. 3
48	9. 63367	16	9. 67811	19	0. 32189	9. 95556	4	52	2 | 0. 6
49	9. 63383	15	9. 67830	20	0. 32170	9. 95552	3	51	3 | 0. 9
50	9. 63398		9. 67850		0. 32150	9. 95549		50	4 | 1. 2
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

25°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.63398		9.67850		0.32150	9.95549	4	50	
		16		19					20
51	9.63414	16	9.67869	20	0.32131	9.95545	3	49	1 2.0
52	9.63430	16	9.67889	19	0.32111	9.95542	4	48	2 4.0
53	9.63446	16	9.67908	20	0.32092	9.95538	4	47	3 6.0
54	9.63462	16	9.67928	19	0.32072	9.95534	3	46	4 8.0
55	9.63478	16	9.67947	20	0.32053	9.95531	4	45	5 10.0
56	9.63494	16	9.67967	19	0.32033	9.95527	4	44	6 12.0
									7 14.0
57	9.63510	15	9.67986	19	0.32014	9.95523	3	43	8 16.0
58	9.63525	16	9.68005	20	0.31995	9.95520	4	42	9 18.0
59	9.63541	16	9.68025	19	0.31975	9.95516	3	41	
60	9.63557	16	9.68044	20	0.31956	9.95513	4	40	19
61	9.63573	16	9.68064	19	0.31936	9.95509	4	39	1 1.9
62	9.63589	15	9.68083	20	0.31917	9.95505	3	38	2 3.8
63	9.63604	16	9.68103	19	0.31897	9.95502	4	37	3 5.7
									4 7.6
64	9.63620	16	9.68122	20	0.31878	9.95498	4	36	5 9.5
65	9.63636	16	9.68142	19	0.31858	9.95494	3	35	6 11.4
66	9.63652	16	9.68161	19	0.31839	9.95491	4	34	7 13.3
									8 15.2
67	9.63668	15	9.68180	20	0.31820	9.95487	4	33	9 17.1
68	9.63683	16	9.68200	19	0.31800	9.95483	3	32	
69	9.63699	16	9.68219	20	0.31781	9.95480	4	31	
70	9.63715	16	9.68239	19	0.31761	9.95476	3	30	
71	9.63731	15	9.68258	19	0.31742	9.95473	4	29	16
72	9.63746	16	9.68277	20	0.31723	9.95469	4	28	1 1.6
73	9.63762	16	9.68297	19	0.31703	9.95465	3	27	2 3.2
									3 4.8
74	9.63778	16	9.68316	20	0.31684	9.95462	4	26	4 6.4
75	9.63794	15	9.68336	19	0.31664	9.95458	4	25	5 8.0
76	9.63809	16	9.68355	19	0.31645	9.95454	3	24	6 9.6
									7 11.2
77	9.63825	16	9.68374	20	0.31626	9.95451	4	23	8 12.8
78	9.63841	15	9.68394	19	0.31606	9.95447	4	22	9 14.4
79	9.63856	16	9.68413	19	0.31587	9.95443	3	21	
80	9.63872	16	9.68432	20	0.31568	9.95440	4	20	15
81	9.63888	15	9.68452	19	0.31548	9.95436	4	19	1 1.5
82	9.63903	16	9.68471	19	0.31529	9.95432	3	18	2 3.0
83	9.63919	16	9.68490	20	0.31510	9.95429	4	17	3 4.5
									4 6.0
84	9.63935	15	9.68510	19	0.31490	9.95425	4	16	5 7.5
85	9.63950	16	9.68529	19	0.31471	9.95421	3	15	6 9.0
86	9.63966	16	9.68548	20	0.31452	9.95418	4	14	7 10.5
									8 12.0
87	9.63982	15	9.68568	19	0.31432	9.95414	4	13	9 13.5
88	9.63997	16	9.68587	19	0.31413	9.95410	3	12	
89	9.64013	15	9.68606	20	0.31394	9.95407	4	11	
90	9.64028	16	9.68626	19	0.31374	9.95403	4	10	
									4
91	9.64044	16	9.68645	19	0.31355	9.95399	3	09	
92	9.64060	15	9.68664	19	0.31336	9.95396	4	08	1 0.4
93	9.64075	16	9.68683	20	0.31317	9.95392	4	07	2 0.8
									3 1.2
94	9.64091	15	9.68703	19	0.31297	9.95388	4	06	4 1.6
95	9.64106	16	9.68722	19	0.31278	9.95384	3	05	5 2.0
96	9.64122	16	9.68741	19	0.31259	9.95381	4	04	6 2.4
									7 2.8
97	9.64138	15	9.68760	20	0.31240	9.95377	4	03	8 3.2
98	9.64153	16	9.68780	19	0.31220	9.95373	4	02	9 3.6
99	9.64169	15	9.68799	19	0.31201	9.95369	3	01	
100	9.64184		9.68818		0.31182	9.95366		00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

26°									
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.64184	16	9.68818	19	0.31182	9.95366	4	100	
									20
01	9.64200	15	9.68837	20	0.31163	9.95362	3	99	
02	9.64215	16	9.68857	19	0.31143	9.95359	4	98	1 2.0
03	9.64231	15	9.68876	19	0.31124	9.95355	4	97	2 4.0
									3 6.0
04	9.64246	16	9.68895	19	0.31105	9.95351	3	96	4 8.0
05	9.64262	15	9.68914	20	0.31086	9.95348	4	95	5 10.0
06	9.64277	16	9.68934	19	0.31066	9.95344	4	94	6 12.0
									7 14.0
07	9.64293	15	9.68953	19	0.31047	9.95340	4	93	8 16.0
08	9.64308	16	9.68972	19	0.31028	9.95336	3	92	9 18.0
09	9.64324	15	9.68991	19	0.31009	9.95333	4	91	
10	9.64339	16	9.69010	19	0.30990	9.95329	4	90	19
11	9.64355	15	9.69029	20	0.30971	9.95325	3	89	1 1.9
12	9.64370	16	9.69049	19	0.30951	9.95322	4	88	2 3.8
13	9.64386	15	9.69068	19	0.30932	9.95318	4	87	3 5.7
									4 7.6
14	9.64401	16	9.69087	19	0.30913	9.95314	4	86	5 9.5
15	9.64417	15	9.69106	19	0.30894	9.95310	3	85	6 11.4
16	9.64432	15	9.69125	19	0.30875	9.95307	4	84	7 13.3
									8 15.2
17	9.64447	16	9.69144	20	0.30856	9.95303	4	83	9 17.1
18	9.64463	15	9.69164	19	0.30836	9.95299	4	82	
19	9.64478	16	9.69183	19	0.30817	9.95295	3	81	
20	9.64494	15	9.69202	19	0.30798	9.95292	4	80	16
21	9.64509	15	9.69221	19	0.30779	9.95288	4	79	
22	9.64524	16	9.69240	19	0.30760	9.95284	3	78	1 1.6
23	9.64540	15	9.69259	19	0.30741	9.95281	4	77	2 3.2
									3 4.8
24	9.64555	16	9.69278	20	0.30722	9.95277	4	76	4 6.4
25	9.64571	15	9.69298	19	0.30702	9.95273	4	75	5 8.0
26	9.64586	15	9.69317	19	0.30683	9.95269	3	74	6 9.6
									7 11.2
27	9.64601	16	9.69336	19	0.30664	9.95266	4	73	8 12.8
28	9.64617	15	9.69355	19	0.30645	9.95262	4	72	9 14.4
29	9.64632	15	9.69374	19	0.30626	9.95258	4	71	
30	9.64647	16	9.69393	19	0.30607	9.95254	3	70	15
31	9.64663	15	9.69412	19	0.30588	9.95251	4	69	1 1.5
32	9.64678	15	9.69431	19	0.30569	9.95247	4	68	2 3.0
33	9.64693	16	9.69450	19	0.30550	9.95243	4	67	3 4.5
									4 6.0
34	9.64709	15	9.69469	19	0.30531	9.95239	3	66	5 7.5
35	9.64724	15	9.69488	19	0.30512	9.95236	4	65	6 9.0
36	9.64739	16	9.69507	19	0.30493	9.95232	4	64	7 10.5
									8 12.0
37	9.64755	15	9.69526	19	0.30474	9.95228	4	63	9 13.5
38	9.64770	15	9.69545	20	0.30455	9.95224	3	62	
39	9.64785	15	9.69565	19	0.30435	9.95221	4	61	
40	9.64800	16	9.69584	19	0.30416	9.95217	4	60	3
41	9.64816	15	9.69603	19	0.30397	9.95213	4	59	
42	9.64831	15	9.69622	19	0.30378	9.95209	3	58	1 0.3
43	9.64846	15	9.69641	19	0.30359	9.95206	4	57	2 0.6
									3 0.9
44	9.64861	16	9.69660	19	0.30340	9.95202	4	56	4 1.2
45	9.64877	15	9.69679	19	0.30321	9.95198	4	55	5 1.5
46	9.64892	15	9.69698	19	0.30302	9.95194	4	54	6 1.8
									7 2.1
47	9.64907	15	9.69717	19	0.30283	9.95190	3	53	8 2.4
48	9.64922	16	9.69736	19	0.30264	9.95187	4	52	9 2.7
49	9.64938	15	9.69755	19	0.30245	9.95183	4	51	
50	9.64953		9.69774		0.30226	9.95179		50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
				26°					
50	9.64953	15	9.69774	19	0.30226	9.95179	4	50	
51	9.64968	15	9.69793	19	0.30207	9.95175	3	49	19
52	9.64983	15	9.69812	19	0.30188	9.95172	4	48	1 | 1.9
53	9.64998	16	9.69831	19	0.30169	9.95168	4	47	2 | 3.8
54	9.65014	15	9.69850	18	0.30150	9.95164	4	46	3 | 5.7
55	9.65029	15	9.69868	19	0.30132	9.95160	4	45	4 | 7.6
56	9.65044	15	9.69887	19	0.30113	9.95156	3	44	5 | 9.5
57	9.65059	15	9.69906	19	0.30094	9.95153	4	43	6 | 11.4
58	9.65074	15	9.69925	19	0.30075	9.95149	4	42	7 | 13.3
59	9.65089	15	9.69944	19	0.30056	9.95145	4	41	8 | 15.2
60	9.65104	16	9.69963	19	0.30037	9.95141	4	40	9 | 17.1
61	9.65120	15	9.69982	19	0.30018	9.95137	3	39	18
62	9.65135	15	9.70001	19	0.29999	9.95134	4	38	1 | 1.8
63	9.65150	15	9.70020	19	0.29980	9.95130	4	37	2 | 3.6
64	9.65165	15	9.70039	19	0.29961	9.95126	4	36	3 | 5.4
65	9.65180	15	9.70058	19	0.29942	9.95122	4	35	4 | 7.2
66	9.65195	15	9.70077	19	0.29923	9.95118	3	34	5 | 9.0
67	9.65210	15	9.70096	18	0.29904	9.95115	4	33	6 | 10.8
68	9.65225	15	9.70114	19	0.29886	9.95111	4	32	7 | 12.6
69	9.65240	15	9.70133	19	0.29867	9.95107	4	31	8 | 14.4
70	9.65255	16	9.70152	19	0.29848	9.95103	4	30	9 | 16.2
71	9.65271	15	9.70171	19	0.29829	9.95099	3	29	15
72	9.65286	15	9.70190	19	0.29810	9.95096	4	28	1 | 1.5
73	9.65301	15	9.70209	19	0.29791	9.95092	4	27	2 | 3.0
74	9.65316	15	9.70228	19	0.29772	9.95088	4	26	3 | 4.5
75	9.65331	15	9.70247	18	0.29753	9.95084	4	25	4 | 6.0
76	9.65346	15	9.70265	19	0.29735	9.95080	4	24	5 | 7.5
77	9.65361	15	9.70284	19	0.29716	9.95076	3	23	6 | 9.0
78	9.65376	15	9.70303	19	0.29697	9.95073	4	22	7 | 10.5
79	9.65391	15	9.70322	19	0.29678	9.95069	4	21	8 | 12.0
80	9.65406	15	9.70341	19	0.29659	9.95065	4	20	9 | 13.5
81	9.65421	15	9.70360	19	0.29640	9.95061	4	19	14
82	9.65436	15	9.70379	18	0.29621	9.95057	3	18	1 | 1.4
83	9.65451	15	9.70397	19	0.29603	9.95054	4	17	2 | 2.8
84	9.65466	15	9.70416	19	0.29584	9.95050	4	16	3 | 4.2
85	9.65481	15	9.70435	19	0.29565	9.95046	4	15	4 | 5.6
86	9.65496	15	9.70454	19	0.29546	9.95042	4	14	5 | 7.0
87	9.65511	15	9.70473	18	0.29527	9.95038	4	13	6 | 8.4
88	9.65526	15	9.70491	19	0.29509	9.95034	4	12	7 | 9.8
89	9.65541	15	9.70510	19	0.29490	9.95030	3	11	8 | 11.2
90	9.65556	15	9.70529	19	0.29471	9.95027	4	10	9 | 12.6
91	9.65571	14	9.70548	19	0.29452	9.95023	4	09	4
92	9.65585	15	9.70567	18	0.29433	9.95019	4	08	1 | 0.4
93	9.65600	15	9.70585	19	0.29415	9.95015	4	07	2 | 0.8
94	9.65615	15	9.70604	19	0.29396	9.95011	4	06	3 | 1.2
95	9.65630	15	9.70623	19	0.29377	9.95007	3	05	4 | 1.6
96	9.65645	15	9.70642	18	0.29358	9.95004	4	04	5 | 2.0
97	9.65660	15	9.70660	19	0.29340	9.95000	4	03	6 | 2.4
98	9.65675	15	9.70679	19	0.29321	9.94996	4	02	7 | 2.8
99	9.65690	15	9.70698	19	0.29302	9.94992	4	01	8 | 3.2
100	9.65705		9.70717		0.29283	9.94988		00	9 | 3.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
				63°					

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					27°				
00	9.65705	15	9.70717	18	0.29283	9.94988	4	100	
01	9.65720	14	9.70735	19	0.29265	9.94984	4	99	19
02	9.65734	15	9.70754	19	0.29246	9.94980	4	98	1 | 1.9
03	9.65749	15	9.70773	19	0.29227	9.94976	3	97	2 | 3.8
04	9.65764	15	9.70792	18	0.29208	9.94973	4	96	3 | 5.7
05	9.65779	15	9.70810	19	0.29190	9.94969	4	95	4 | 7.6
06	9.65794	15	9.70829	19	0.29171	9.94965	4	94	5 | 9.5
07	9.65809	14	9.70848	18	0.29152	9.94961	4	93	6 | 11.4
08	9.65823	15	9.70866	19	0.29134	9.94957	4	92	7 | 13.3
09	9.65838	15	9.70885	19	0.29115	9.94953	4	91	8 | 15.2
10	9.65853	15	9.70904	18	0.29096	9.94949	3	90	9 | 17.1
11	9.65868	15	9.70922	19	0.29078	9.94946	4	89	18
12	9.65883	15	9.70941	19	0.29059	9.94942	4	88	1 | 1.8
13	9.65898	14	9.70960	18	0.29040	9.94938	4	87	2 | 3.6
14	9.65912	15	9.70978	19	0.29022	9.94934	4	86	3 | 5.4
15	9.65927	15	9.70997	19	0.29003	9.94930	4	85	4 | 7.2
16	9.65942	15	9.71016	18	0.28984	9.94926	4	84	5 | 9.0
17	9.65957	14	9.71034	19	0.28966	9.94922	4	83	6 | 10.8
18	9.65971	15	9.71053	19	0.28947	9.94918	4	82	7 | 12.6
19	9.65986	15	9.71072	18	0.28928	9.94914	3	81	8 | 14.4
20	9.66001	15	9.71090	19	0.28910	9.94911	4	80	9 | 16.2
21	9.66016	14	9.71109	19	0.28891	9.94907	4	79	15
22	9.66030	15	9.71128	18	0.28872	9.94903	4	78	1 | 1.5
23	9.66045	15	9.71146	19	0.28854	9.94899	4	77	2 | 3.0
24	9.66060	15	9.71165	19	0.28835	9.94895	4	76	3 | 4.5
25	9.66075	14	9.71184	18	0.28816	9.94891	4	75	4 | 6.0
26	9.66089	15	9.71202	19	0.28798	9.94887	4	74	5 | 7.5
27	9.66104	15	9.71221	18	0.28779	9.94883	4	73	6 | 9.0
28	9.66119	14	9.71239	19	0.28761	9.94879	4	72	7 | 10.5
29	9.66133	15	9.71258	19	0.28742	9.94875	4	71	8 | 12.0
30	9.66148	15	9.71277	18	0.28723	9.94871	3	70	9 | 13.5
31	9.66163	14	9.71295	19	0.28705	9.94868	4	69	14
32	9.66177	15	9.71314	18	0.28686	9.94864	4	68	1 | 1.4
33	9.66192	15	9.71332	19	0.28668	9.94860	4	67	2 | 2.8
34	9.66207	14	9.71351	19	0.28649	9.94856	4	66	3 | 4.2
35	9.66221	15	9.71370	18	0.28630	9.94852	4	65	4 | 5.6
36	9.66236	15	9.71388	19	0.28612	9.94848	4	64	5 | 7.0
37	9.66251	14	9.71407	18	0.28593	9.94844	4	63	6 | 8.4
38	9.66265	15	9.71425	19	0.28575	9.94840	4	62	7 | 9.8
39	9.66280	15	9.71444	18	0.28556	9.94836	4	61	8 | 11.2
40	9.66295	14	9.71462	19	0.28538	9.94832	4	60	9 | 12.6
41	9.66309	15	9.71481	18	0.28519	9.94828	4	59	8
42	9.66324	14	9.71499	19	0.28501	9.94824	4	58	1 | 0.3
43	9.66338	15	9.71518	19	0.28482	9.94820	3	57	2 | 0.6
44	9.66353	15	9.71537	18	0.28463	9.94817	4	56	3 | 0.9
45	9.66368	14	9.71555	19	0.28445	9.94813	4	55	4 | 1.2
46	9.66382	15	9.71574	18	0.28426	9.94809	4	54	5 | 1.5
47	9.66397	14	9.71592	19	0.28408	9.94805	4	53	6 | 1.8
48	9.66411	15	9.71611	18	0.28389	9.94801	4	52	7 | 2.1
49	9.66426	15	9.71629	19	0.28371	9.94797	4	51	8 | 2.4
50	9.66441		9.71648		0.28352	9.94793		50	9 | 2.7
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
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TABLE LII.—*Common logarithms of circular functions*—Continued

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	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.66441	14	9.71648	18	0.28352	9.94793	4	50	
51	9.66455	15	9.71666	19	0.28334	9.94789	4	49	19
52	9.66470	14	9.71685	18	0.28315	9.94785	4	48	1 | 1.9
53	9.66484	15	9.71703	19	0.28297	9.94781	4	47	2 | 3.8
54	9.66499	14	9.71722	18	0.28278	9.94777	4	46	3 | 5.7
55	9.66513	15	9.71740	19	0.28260	9.94773	4	45	4 | 7.6
56	9.66528	14	9.71759	18	0.28241	9.94769	4	44	5 | 9.5
57	9.66542	15	9.71777	19	0.28223	9.94765	4	43	6 | 11.4
58	9.66557	14	9.71796	18	0.28204	9.94761	4	42	7 | 13.3
59	9.66571	15	9.71814	19	0.28186	9.94757	4	41	8 | 15.2
60	9.66586	14	9.71833	18	0.28167	9.94753	4	40	9 | 17.1
61	9.66600	15	9.71851	18	0.28149	9.94749	4	39	18
62	9.66615	14	9.71869	19	0.28131	9.94745	4	38	1 | 1.8
63	9.66629	15	9.71888	18	0.28112	9.94741	4	37	2 | 3.6
64	9.66644	14	9.71906	19	0.28094	9.94737	3	36	3 | 5.4
65	9.66658	15	9.71925	18	0.28075	9.94734	4	35	4 | 7.2
66	9.66673	14	9.71943	19	0.28057	9.94730	4	34	5 | 9.0
67	9.66687	15	9.71962	18	0.28038	9.94726	4	33	6 | 10.8
68	9.66702	14	9.71980	18	0.28020	9.94722	4	32	7 | 12.6
69	9.66716	15	9.71998	19	0.28002	9.94718	4	31	8 | 14.4
70	9.66731	14	9.72017	18	0.27983	9.94714	4	30	9 | 16.2
71	9.66745	14	9.72035	19	0.27965	9.94710	4	29	15
72	9.66759	15	9.72054	18	0.27946	9.94706	4	28	1 | 1.5
73	9.66774	14	9.72072	19	0.27928	9.94702	4	27	2 | 3.0
74	9.66788	15	9.72091	18	0.27909	9.94698	4	26	3 | 4.5
75	9.66803	14	9.72109	18	0.27891	9.94694	4	25	4 | 6.0
76	9.66817	14	9.72127	19	0.27873	9.94690	4	24	5 | 7.5
77	9.66831	15	9.72146	18	0.27854	9.94686	4	23	6 | 9.0
78	9.66846	14	9.72164	18	0.27836	9.94682	4	22	7 | 10.5
79	9.66860	15	9.72182	19	0.27818	9.94678	4	21	8 | 12.0
80	9.66875	14	9.72201	18	0.27799	9.94674	4	20	9 | 13.5
81	9.66889	14	9.72219	19	0.27781	9.94670	4	19	14
82	9.66903	15	9.72238	18	0.27762	9.94666	4	18	1 | 1.4
83	9.66918	14	9.72256	18	0.27744	9.94662	4	17	2 | 2.8
84	9.66932	14	9.72274	19	0.27726	9.94658	4	16	3 | 4.2
85	9.66946	15	9.72293	18	0.27707	9.94654	4	15	4 | 5.6
86	9.66961	14	9.72311	18	0.27689	9.94650	4	14	5 | 7.0
87	9.66975	14	9.72329	19	0.27671	9.94646	4	13	6 | 8.4
88	9.66989	15	9.72348	18	0.27652	9.94642	4	12	7 | 9.8
89	9.67004	14	9.72366	18	0.27634	9.94638	4	11	8 | 11.2
90	9.67018	14	9.72384	19	0.27616	9.94634	4	10	9 | 12.6
91	9.67032	15	9.72403	18	0.27597	9.94630	4	09	4
92	9.67047	14	9.72421	18	0.27579	9.94626	4	08	1 | 0.4
93	9.67061	14	9.72439	19	0.27561	9.94622	4	07	2 | 0.8
94	9.67075	15	9.72458	18	0.27542	9.94618	4	06	3 | 1.2
95	9.67090	14	9.72476	18	0.27524	9.94614	4	05	4 | 1.6
96	9.67104	14	9.72494	19	0.27506	9.94610	4	04	5 | 2.0
97	9.67118	14	9.72513	18	0.27487	9.94606	4	03	6 | 2.4
98	9.67132	15	9.72531	18	0.27469	9.94602	4	02	7 | 2.8
99	9.67147	14	9.72549	18	0.27451	9.94598	5	01	8 | 3.2
100	9.67161		9.72567		0.27433	9.94593		00	9 | 3.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

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	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.67161	14	9.72567	19	0.27433	9.94593	4	100	
01	9.67175	14	9.72586	18	0.27414	9.94589	4	99	19
02	9.67189	15	9.72604	18	0.27396	9.94585	4	98	1 1.9
03	9.67204	14	9.72622	19	0.27378	9.94581	4	97	2 3.8
04	9.67218	14	9.72641	18	0.27359	9.94577	4	96	3 5.7
05	9.67232	14	9.72659	18	0.27341	9.94573	4	95	4 7.6
06	9.67246	15	9.72677	18	0.27323	9.94569	4	94	5 9.5
07	9.67261	14	9.72695	19	0.27305	9.94565	4	93	6 11.4
08	9.67275	14	9.72714	18	0.27286	9.94561	4	92	7 13.3
09	9.67289	14	9.72732	18	0.27268	9.94557	4	91	8 15.2
10	9.67303	14	9.72750	18	0.27250	9.94553	4	90	9 17.1
11	9.67317	15	9.72768	19	0.27232	9.94549	4	89	18
12	9.67332	14	9.72787	18	0.27213	9.94545	4	88	1 1.8
13	9.67346	14	9.72805	18	0.27195	9.94541	4	87	2 3.6
14	9.67360	14	9.72823	18	0.27177	9.94537	4	86	3 5.4
15	9.67374	14	9.72841	18	0.27159	9.94533	4	85	4 7.2
16	9.67388	14	9.72859	19	0.27141	9.94529	4	84	5 9.0
17	9.67402	15	9.72878	18	0.27122	9.94525	4	83	6 10.8
18	9.67417	14	9.72896	18	0.27104	9.94521	4	82	7 12.6
19	9.67431	14	9.72914	18	0.27086	9.94517	4	81	8 14.4
20	9.67445	14	9.72932	18	0.27068	9.94513	5	80	9 16.2
21	9.67459	14	9.72950	19	0.27050	9.94508	4	79	15
22	9.67473	14	9.72969	18	0.27031	9.94504	4	78	1 1.5
23	9.67487	14	9.72987	18	0.27013	9.04500	4	77	2 3.0
24	9.67501	14	9.73005	18	0.26995	9.94496	4	76	3 4.5
25	9.67515	15	9.73023	18	0.26977	9.94492	4	75	4 6.0
26	9.67530	14	9.73041	19	0.26959	9.94488	4	74	5 7.5
27	9.67544	14	9.73060	18	0.26940	9.94484	4	73	6 9.0
28	9.67558	14	9.73078	18	0.26922	9.94480	4	72	7 10.5
29	9.67572	14	9.73096	18	0.26904	9.94476	4	71	8 12.0
30	9.67586	14	9.73114	18	0.26886	9.94472	4	70	9 13.5
31	9.67600	14	9.73132	18	0.26868	9.94468	4	69	14
32	9.67614	14	9.73150	19	0.26850	9.94464	4	68	1 1.4
33	9.67628	14	9.73169	18	0.26831	9.94460	5	67	2 2.8
34	9.67642	14	9.73187	18	0.26813	9.94455	4	66	3 4.2
35	9.67656	14	9.73205	18	0.26795	9.94451	4	65	4 5.6
36	9.67670	14	9.73223	18	0.26777	9.94447	4	64	5 7.0
37	9.67684	14	9.73241	18	0.26759	9.94443	4	63	6 8.4
38	9.67698	14	9.73259	18	0.26741	9.94439	4	62	7 9.8
39	9.67712	14	9.73277	18	0.26723	9.94435	4	61	8 11.2
40	9.67726	14	9.73295	19	0.26705	9.94431	4	60	9 12.6
41	9.67740	14	9.73314	18	0.26686	9.94427	4	59	4
42	9.67754	14	9.73332	18	0.26668	9.94423	4	58	1 0.4
43	9.67768	14	9.73350	18	0.26650	9.94419	4	57	2 0.8
44	9.67782	14	9.73368	18	0.26632	9.94415	5	56	3 1.2
45	9.67796	14	9.73386	18	0.26614	9.94410	4	55	4 1.6
46	9.67810	14	9.73404	18	0.26596	9.94406	4	54	5 2.0
47	9.67824	14	9.73422	18	0.26578	9.94402	4	53	6 2.4
48	9.67838	14	9.73440	18	0.26560	9.94398	4	52	7 2.8
49	9.67852	14	9.73458	18	0.26542	9.94394	4	51	8 3.2
50	9.67866		9.73476		0.26524	9.94390		50	9 3.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
				28°					
50	9.67866	14	9.73476	19	0.26524	9.94390	4	50	
51	9.67880	14	9.73495	18	0.26505	9.94386	4	49	18
52	9.67894	14	9.73513	18	0.26487	9.94382	5	48	1 1.8
53	9.67908	14	9.73531	18	0.26469	9.94377	4	47	2 3.6
54	9.67922	14	9.73549	18	0.26451	9.94373	4	46	3 5.4
55	9.67936	14	9.73567	18	0.26433	9.94369	4	45	4 7.2
56	9.67950	14	9.73585	18	0.26415	9.94365	4	44	5 9.0
57	9.67964	14	9.73603	18	0.26397	9.94361	4	43	6 10.8
58	9.67978	14	9.73621	18	0.26379	9.94357	4	42	7 12.6
59	9.67992	14	9.73639	18	0.26361	9.94353	4	41	8 14.4
60	9.68006	14	9.73657	18	0.26343	9.94349	5	40	9 16.2
61	9.68020	13	9.73675	18	0.26325	9.94344	4	39	17
62	9.68033	14	9.73693	18	0.26307	9.94340	4	38	1 1.7
63	9.68047	14	9.73711	18	0.26289	9.94336	4	37	2 3.4
64	9.68061	14	9.73729	18	0.26271	9.94332	4	36	3 5.1
65	9.68075	14	9.73747	18	0.26253	9.94328	4	35	4 6.8
66	9.68089	14	9.73765	18	0.26235	9.94324	4	34	5 8.5
67	9.68103	14	9.73783	18	0.26217	9.94320	5	33	6 10.2
68	9.68117	13	9.73801	18	0.26199	9.94315	4	32	7 11.9
69	9.68130	14	9.73819	18	0.26181	9.94311	4	31	8 13.6
70	9.68144	14	9.73837	18	0.26163	9.94307	4	30	9 15.3
71	9.68158	14	9.73855	18	0.26145	9.94303	4	29	14
72	9.68172	14	9.73873	18	0.26127	9.94299	4	28	1 1.4
73	9.68186	14	9.73891	18	0.26109	9.94295	4	27	2 2.8
74	9.68200	13	9.73909	18	0.26091	9.94291	5	26	3 4.2
75	9.68213	14	9.73927	18	0.26073	9.94286	4	25	4 5.6
76	9.68227	14	9.73945	18	0.26055	9.94282	4	24	5 7.0
77	9.68241	14	9.73963	18	0.26037	9.94278	4	23	6 8.4
78	9.68255	14	9.73981	18	0.26019	9.94274	4	22	7 9.8
79	9.68269	14	9.73999	18	0.26001	9.94270	4	21	8 11.2
80	9.68283	13	9.74017	18	0.25983	9.94266	5	20	9 12.6
81	9.68296	14	9.74035	18	0.25965	9.94261	4	19	13
82	9.68310	14	9.74053	18	0.25947	9.94257	4	18	1 1.3
83	9.68324	14	9.74071	18	0.25929	9.94253	4	17	2 2.6
84	9.68338	13	9.74089	18	0.25911	9.94249	4	16	3 3.9
85	9.68351	14	9.74107	18	0.25893	9.94245	4	15	4 5.2
86	9.68365	14	9.74125	17	0.25875	9.94241	5	14	5 6.5
87	9.68379	14	9.74142	18	0.25858	9.94236	4	13	6 7.8
88	9.68393	13	9.74160	18	0.25840	9.94232	4	12	7 9.1
89	9.68406	14	9.74178	18	0.25822	9.94228	4	11	8 10.4
90	9.68420	14	9.74196	18	0.25804	9.94224	4	10	9 11.7
91	9.68434	14	9.74214	18	0.25786	9.94220	5	09	5
92	9.68448	13	9.74232	18	0.25768	9.94215	4	08	1 0.5
93	9.68461	14	9.74250	18	0.25750	9.94211	4	07	2 1.0
94	9.68475	14	9.74268	18	0.25732	9.94207	4	06	3 1.5
95	9.68489	13	9.74286	18	0.25714	9.94203	4	05	4 2.0
96	9.68502	14	9.74304	18	0.25696	9.94199	4	04	5 2.5
97	9.68516	14	9.74322	17	0.25678	9.94195	5	03	6 3.0
98	9.68530	13	9.74339	18	0.25661	9.94190	4	02	7 3.5
99	9.68543	14	9.74357	18	0.25643	9.94186	4	01	8 4.0
100	9.68557		9.74375		0.25625	9.94182		00	9 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
				61°					

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TABLE LII.—*Common logarithms of circular functions*—Continued

29°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.68557	14	9.74375	18	0.25625	9.94182	4	100	
01	9.68571	13	9.74393	18	0.25607	9.94178	4	99	18
02	9.68584	14	9.74411	18	0.25589	9.94174	5	98	1 1.8
03	9.68598	14	9.74429	18	0.25571	9.94169	4	97	2 3.6
04	9.68612	13	9.74447	18	0.25553	9.94165	4	96	3 5.4
05	9.68625	14	9.74465	17	0.25535	9.94161	4	95	4 7.2
06	9.68639	14	9.74482	18	0.25518	9.94157	5	94	5 9.0
07	9.68653	13	9.74500	18	0.25500	9.94152	4	93	6 10.8
08	9.68666	14	9.74518	18	0.25482	9.94148	4	92	7 12.6
09	9.68680	14	9.74536	18	0.25464	9.94144	4	91	8 14.4
10	9.68694	13	9.74554	18	0.25446	9.94140	4	90	9 16.2
11	9.68707	14	9.74572	17	0.25428	9.94136	5	89	17
12	9.68721	13	9.74589	18	0.25411	9.94131	4	88	1 1.7
13	9.68734	14	9.74607	18	0.25393	9.94127	4	87	2 3.4
14	9.68748	14	9.74625	18	0.25375	9.94123	4	86	3 5.1
15	9.68762	13	9.74643	18	0.25357	9.94119	5	85	4 6.8
16	9.68775	14	9.74661	18	0.25339	9.94114	4	84	5 8.5
17	9.68789	13	9.74679	17	0.25321	9.94110	4	83	6 10.2
18	9.68802	14	9.74696	18	0.25304	9.94106	4	82	7 11.9
19	9.68816	13	9.74714	18	0.25286	9.94102	4	81	8 13.6
20	9.68829	14	9.74732	18	0.25268	9.94098	5	80	9 15.3
21	9.68843	14	9.74750	18	0.25250	9.94093	4	79	14
22	9.68857	13	9.74768	17	0.25232	9.94089	4	78	1 1.4
23	9.68870	14	9.74785	18	0.25215	9.94085	4	77	2 2.8
24	9.68884	13	9.74803	18	0.25197	9.94081	5	76	3 4.2
25	9.68897	14	9.74821	18	0.25179	9.94076	4	75	4 5.6
26	9.68911	13	9.74839	17	0.25161	9.94072	4	74	5 7.0
27	9.68924	14	9.74856	18	0.25144	9.94068	4	73	6 8.4
28	9.68938	13	9.74874	18	0.25126	9.94064	5	72	7 9.8
29	9.68951	14	9.74892	18	0.25108	9.94059	4	71	8 11.2
30	9.68965	13	9.74910	17	0.25090	9.94055	4	70	9 12.6
31	9.68978	14	9.74927	18	0.25073	9.94051	4	69	13
32	9.68992	13	9.74945	18	0.25055	9.94047	5	68	1 1.3
33	9.69005	14	9.74963	18	0.25037	9.94042	4	67	2 2.6
34	9.69019	13	9.74981	17	0.25019	9.94038	4	66	3 3.9
35	9.69032	14	9.74998	18	0.25002	9.94034	4	65	4 5.2
36	9.69046	13	9.75016	18	0.24984	9.94030	5	64	5 6.5
37	9.69059	14	9.75034	18	0.24966	9.94025	4	63	6 7.8
38	9.69073	13	9.75052	17	0.24948	9.94021	4	62	7 9.1
39	9.69086	14	9.75069	18	0.24931	9.94017	5	61	8 10.4
40	9.69100	13	9.75087	18	0.24913	9.94012	4	60	9 11.7
41	9.69113	14	9.75105	18	0.24895	9.94008	4	59	4
42	9.69127	13	9.75123	17	0.24877	9.94004	4	58	1 0.4
43	9.69140	13	9.75140	18	0.24860	9.94000	5	57	2 0.8
44	9.69153	14	9.75158	18	0.24842	9.93995	4	56	3 1.2
45	9.69167	13	9.75176	17	0.24824	9.93991	4	55	4 1.6
46	9.69180	14	9.75193	18	0.24807	9.93987	4	54	5 2.0
47	9.69194	13	9.75211	18	0.24789	9.93983	5	53	6 2.4
48	9.69207	13	9.75229	18	0.24771	9.93978	4	52	7 2.8
49	9.69220	14	9.75247	17	0.24753	9.93974	4	51	8 3.2
50	9.69234		9.75264		0.24736	9.93970		50	9 3.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

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	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.69234	13	9.75264	18	0.24736	9.93970	5	50	
51	9.69247	14	9.75282	18	0.24718	9.93965	4	49	18
52	9.69261	13	9.75300	17	0.24700	9.93961	4	48	1 | 1.8
53	9.69274	13	9.75317	18	0.24683	9.93957	4	47	2 | 3.6
54	9.69287	14	9.75335	18	0.24665	9.93953	5	46	3 | 5.4
55	9.69301	13	9.75353	17	0.24647	9.93948	4	45	4 | 7.2
56	9.69314	14	9.75370	18	0.24630	9.93944	4	44	5 | 9.0
57	9.69328	13	9.75388	18	0.24612	9.93940	5	43	6 | 10.8
58	9.69341	13	9.75406	17	0.24594	9.93935	4	42	7 | 12.6
59	9.69354	14	9.75423	18	0.24577	9.93931	4	41	8 | 14.4
60	9.69368	13	9.75441	18	0.24559	9.93927	5	40	9 | 16.2
61	9.69381	13	9.75459	17	0.24541	9.93922	4	39	17
62	9.69394	14	9.75476	18	0.24524	9.93918	4	38	1 | 1.7
63	9.69408	13	9.75494	17	0.24506	9.93914	5	37	2 | 3.4
64	9.69421	13	9.75511	18	0.24489	9.93909	4	36	3 | 5.1
65	9.69434	14	9.75529	18	0.24471	9.93905	4	35	4 | 6.8
66	9.69448	13	9.75547	17	0.24453	9.93901	4	34	5 | 8.5
67	9.69461	13	9.75564	18	0.24436	9.93897	5	33	6 | 10.2
68	9.69474	13	9.75582	18	0.24418	9.93892	4	32	7 | 11.9
69	9.69487	14	9.75600	17	0.24400	9.93888	4	31	8 | 13.6
70	9.69501	13	9.75617	18	0.24383	9.93884	5	30	9 | 15.3
71	9.69514	13	9.75635	17	0.24365	9.93879	4	29	14
72	9.69527	14	9.75652	18	0.24348	9.93875	4	28	1 | 1.4
73	9.69541	13	9.75670	18	0.24330	9.93871	5	27	2 | 2.8
74	9.69554	13	9.75688	17	0.24312	9.93866	4	26	3 | 4.2
75	9.69567	13	9.75705	18	0.24295	9.93862	4	25	4 | 5.6
76	9.69580	14	9.75723	17	0.24277	9.93858	5	24	5 | 7.0
77	9.69594	13	9.75740	18	0.24260	9.93853	4	23	6 | 8.4
78	9.69607	13	9.75758	18	0.24242	9.93849	4	22	7 | 9.8
79	9.69620	13	9.75776	17	0.24224	9.93845	5	21	8 | 11.2
80	9.69633	14	9.75793	18	0.24207	9.93840	4	20	9 | 12.6
81	9.69647	13	9.75811	17	0.24189	9.93836	4	19	13
82	9.69660	13	9.75828	18	0.24172	9.93832	5	18	1 | 1.3
83	9.69673	13	9.75846	17	0.24154	9.93827	4	17	2 | 2.6
84	9.69686	13	9.75863	18	0.24137	9.93823	4	16	3 | 3.9
85	9.69699	14	9.75881	18	0.24119	9.93819	5	15	4 | 5.2
86	9.69713	13	9.75899	17	0.24101	9.93814	4	14	5 | 6.5
87	9.69726	13	9.75916	18	0.24084	9.93810	5	13	6 | 7.8
88	9.69739	13	9.75934	17	0.24066	9.93805	4	12	7 | 9.1
89	9.69752	13	9.75951	18	0.24049	9.93801	4	11	8 | 10.4
90	9.69765	14	9.75969	17	0.24031	9.93797	5	10	9 | 11.7
91	9.69779	13	9.75986	18	0.24014	9.93792	4	09	5
92	9.69792	13	9.76004	17	0.23996	9.93788	4	08	1 | 0.5
93	9.69805	13	9.76021	18	0.23979	9.93784	5	07	2 | 1.0
94	9.69818	13	9.76039	17	0.23961	9.93779	4	06	3 | 1.5
95	9.69831	13	9.76056	18	0.23944	9.93775	4	05	4 | 2.0
96	9.69844	14	9.76074	17	0.23926	9.93771	5	04	5 | 2.5
97	9.69858	13	9.76091	18	0.23909	9.93766	4	03	6 | 3.0
98	9.69871	13	9.76109	17	0.23891	9.93762	5	02	7 | 3.5
99	9.69884	13	9.76126	18	0.23874	9.93757	4	01	8 | 4.0
100	9.69897		9.76144		0.23856	9.93753		00	9 | 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9. 69897	13	9. 76144	17	0. 23856	9. 93753	4	100	
01	9. 69910	13	9. 76161	18	0. 23839	9. 93749	5	99	18
02	9. 69923	13	9. 76179	17	0. 23821	9. 93744	4	98	1 | 1.8
03	9. 69936	13	9. 76196	18	0. 23804	9. 93740	4	97	2 | 3.6
04	9. 69949	14	9. 76214	17	0. 23786	9. 93736	5	96	3 | 5.4
05	9. 69963	13	9. 76231	18	0. 23769	9. 93731	4	95	4 | 7.2
06	9. 69976	13	9. 76249	17	0. 23751	9. 93727	5	94	5 | 9.0
07	9. 69989	13	9. 76266	18	0. 23734	9. 93722	4	93	6 | 10.8
08	9. 70002	13	9. 76284	17	0. 23716	9. 93718	4	92	7 | 12.6
09	9. 70015	13	9. 76301	18	0. 23699	9. 93714	5	91	8 | 14.4
10	9. 70028	13	9. 76319	17	0. 23681	9. 93709	4	90	9 | 16.2
11	9. 70041	13	9. 76336	18	0. 23664	9. 93705	5	89	17
12	9. 70054	13	9. 76354	17	0. 23646	9. 93700	4	88	1 | 1.7
13	9. 70067	13	9. 76371	18	0. 23629	9. 93696	4	87	2 | 3.4
14	9. 70080	13	9. 76389	17	0. 23611	9. 93692	5	86	3 | 5.1
15	9. 70093	13	9. 76406	18	0. 23594	9. 93687	4	85	4 | 6.8
16	9. 70106	13	9. 76424	17	0. 23576	9. 93683	5	84	5 | 8.5
17	9. 70119	13	9. 76441	17	0. 23559	9. 93678	4	83	6 | 10.2
18	9. 70132	13	9. 76458	18	0. 23542	9. 93674	4	82	7 | 11.9
19	9. 70145	14	9. 76476	17	0. 23524	9. 93670	5	81	8 | 13.6
20	9. 70159	13	9. 76493	18	0. 23507	9. 93665	4	80	9 | 15.3
21	9. 70172	13	9. 76511	17	0. 23489	9. 93661	5	79	14
22	9. 70185	13	9. 76528	18	0. 23472	9. 93656	4	78	1 | 1.4
23	9. 70198	13	9. 76546	17	0. 23454	9. 93652	4	77	2 | 2.8
24	9. 70211	13	9. 76563	17	0. 23437	9. 93648	5	76	3 | 4.2
25	9. 70224	13	9. 76580	18	0. 23420	9. 93643	4	75	4 | 5.6
26	9. 70237	13	9. 76598	17	0. 23402	9. 93639	5	74	5 | 7.0
27	9. 70250	13	9. 76615	18	0. 23385	9. 93634	4	73	6 | 8.4
28	9. 70263	13	9. 76633	17	0. 23367	9. 93630	5	72	7 | 9.8
29	9. 70276	12	9. 76650	18	0. 23350	9. 93625	4	71	8 | 11.2
30	9. 70288	13	9. 76668	17	0. 23332	9. 93621	4	70	9 | 12.6
31	9. 70301	13	9. 76685	17	0. 23315	9. 93617	5	69	13
32	9. 70314	13	9. 76702	18	0. 23298	9. 93612	4	68	1 | 1.3
33	9. 70327	13	9. 76720	17	0. 23280	9. 93608	5	67	2 | 2.6
34	9. 70340	13	9. 76737	17	0. 23263	9. 93603	4	66	3 | 3.9
35	9. 70353	13	9. 76754	18	0. 23246	9. 93599	5	65	4 | 5.2
36	9. 70366	13	9. 76772	17	0. 23228	9. 93594	4	64	5 | 6.5
37	9. 70379	13	9. 76789	18	0. 23211	9. 93590	5	63	6 | 7.8
38	9. 70392	13	9. 76807	17	0. 23193	9. 93585	4	62	7 | 9.1
39	9. 70405	13	9. 76824	17	0. 23176	9. 93581	4	61	8 | 10.4
40	9. 70418	13	9. 76841	18	0. 23159	9. 93577	5	60	9 | 11.7
41	9. 70431	13	9. 76859	17	0. 23141	9. 93572	4	59	4
42	9. 70444	13	9. 76876	17	0. 23124	9. 93568	5	58	1 | 0.4
43	9. 70457	13	9. 76893	18	0. 23107	9. 93563	4	57	2 | 0.8
44	9. 70470	12	9. 76911	17	0. 23089	9. 93559	5	56	3 | 1.2
45	9. 70482	13	9. 76928	17	0. 23072	9. 93554	4	55	4 | 1.6
46	9. 70495	13	9. 76945	18	0. 23055	9. 93550	5	54	5 | 2.0
47	9. 70508	13	9. 76963	17	0. 23037	9. 93545	4	53	6 | 2.4
48	9. 70521	13	9. 76980	18	0. 23020	9. 93541	4	52	7 | 2.8
49	9. 70534	13	9. 76998	17	0. 23002	9. 93537	5	51	8 | 3.2
50	9. 70547		9. 77015		0. 22985	9. 93532		50	9 | 3.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

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	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9. 70547	13	9. 77015	17	0. 22985	9. 93532	4	50	
51	9. 70560	13	9. 77032	18	0. 22968	9. 93528	5	49	18
52	9. 70573	12	9. 77050	17	0. 22950	9. 93523	4	48	1 | 1.8
53	9. 70585	13	9. 77067	17	0. 22933	9. 93519	5	47	2 | 3.6
54	9. 70598	13	9. 77084	17	0. 22916	9. 93514	4	46	3 | 5.4
55	9. 70611	13	9. 77101	18	0. 22899	9. 93510	5	45	4 | 7.2
56	9. 70624	13	9. 77119	17	0. 22881	9. 93505	4	44	5 | 9.0
57	9. 70637	13	9. 77136	17	0. 22864	9. 93501	5	43	6 | 10.8
58	9. 70650	12	9. 77153	18	0. 22847	9. 93496	4	42	7 | 12.6
59	9. 70662	13	9. 77171	17	0. 22829	9. 93492	5	41	8 | 14.4
60	9. 70675	13	9. 77188	17	0. 22812	9. 93487	4	40	9 | 16.2
61	9. 70688	13	9. 77205	18	0. 22795	9. 93483	5	39	17
62	9. 70701	13	9. 77223	17	0. 22777	9. 93478	4	38	1 | 1.7
63	9. 70714	13	9. 77240	17	0. 22760	9. 93474	5	37	2 | 3.4
64	9. 70727	12	9. 77257	17	0. 22743	9. 93469	4	36	3 | 5.1
65	9. 70739	13	9. 77274	18	0. 22726	9. 93465	5	35	4 | 6.8
66	9. 70752	13	9. 77292	17	0. 22708	9. 93460	4	34	5 | 8.5
67	9. 70765	13	9. 77309	17	0. 22691	9. 93456	5	33	6 | 10.2
68	9. 70778	12	9. 77326	18	0. 22674	9. 93451	4	32	7 | 11.9
69	9. 70790	13	9. 77344	17	0. 22656	9. 93447	5	31	8 | 13.6
70	9. 70803	13	9. 77361	17	0. 22639	9. 93442	4	30	9 | 15.3
71	9. 70816	13	9. 77378	17	0. 22622	9. 93438	5	29	13
72	9. 70829	13	9. 77395	18	0. 22605	9. 93433	4	28	1 | 1.3
73	9. 70842	12	9. 77413	17	0. 22587	9. 93429	5	27	2 | 2.6
74	9. 70854	13	9. 77430	17	0. 22570	9. 93424	4	26	3 | 3.9
75	9. 70867	13	9. 77447	17	0. 22553	9. 93420	5	25	4 | 5.2
76	9. 70880	12	9. 77464	18	0. 22536	9. 93415	4	24	5 | 6.5
77	9. 70892	13	9. 77482	17	0. 22518	9. 93411	5	23	6 | 7.8
78	9. 70905	13	9. 77499	17	0. 22501	9. 93406	4	22	7 | 9.1
79	9. 70918	13	9. 77516	17	0. 22484	9. 93402	5	21	8 | 10.4
80	9. 70931	12	9. 77533	18	0. 22467	9. 93397	4	20	9 | 11.7
81	9. 70943	13	9. 77551	17	0. 22449	9. 93393	5	19	12
82	9. 70956	13	9. 77568	17	0. 22432	9. 93388	4	18	1 | 1.2
83	9. 70969	12	9. 77585	17	0. 22415	9. 93384	5	17	2 | 2.4
84	9. 70981	13	9. 77602	17	0. 22398	9. 93379	4	16	3 | 3.6
85	9. 70994	13	9. 77619	18	0. 22381	9. 93375	5	15	4 | 4.8
86	9. 71007	13	9. 77637	17	0. 22363	9. 93370	4	14	5 | 6.0
87	9. 71020	12	9. 77654	17	0. 22346	9. 93366	5	13	6 | 7.2
88	9. 71032	13	9. 77671	17	0. 22329	9. 93361	4	12	7 | 8.4
89	9. 71045	13	9. 77688	18	0. 22312	9. 93357	5	11	8 | 9.6
90	9. 71058	12	9. 77706	17	0. 22294	9. 93352	5	10	9 | 10.8
91	9. 71070	13	9. 77723	17	0. 22277	9. 93347	4	09	5
92	9. 71083	13	9. 77740	17	0. 22260	9. 93343	5	08	1 | 0.5
93	9. 71096	12	9. 77757	17	0. 22243	9. 93338	4	07	2 | 1.0
94	9. 71108	13	9. 77774	17	0. 22226	9. 93334	5	06	3 | 1.5
95	9. 71121	12	9. 77791	18	0. 22209	9. 93329	4	05	4 | 2.0
96	9. 71133	13	9. 77809	17	0. 22191	9. 93325	5	04	5 | 2.5
97	9. 71146	13	9. 77826	17	0. 22174	9. 93320	4	03	6 | 3.0
98	9. 71159	12	9. 77843	17	0. 22157	9. 93316	5	02	7 | 3.5
99	9. 71171	13	9. 77860	17	0. 22140	9. 93311	4	01	8 | 4.0
100	9. 71184		9. 77877		0. 22123	9. 93307		00	9 | 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	31°							
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.	
00	9.71184	13	9.77877	18	0.22123	9.93307	5	100
01	9.71197	12	9.77895	17	0.22105	9.93302	5	99
02	9.71209	13	9.77912	17	0.22088	9.93297	4	98
03	9.71222	12	9.77929	17	0.22071	9.93293	5	97
04	9.71234	13	9.77946	17	0.22054	9.93288	4	96
05	9.71247	13	9.77963	17	0.22037	9.93284	5	95
06	9.71260	12	9.77980	17	0.22020	9.93279	4	94
07	9.71272	13	9.77997	18	0.22003	9.93275	5	93
08	9.71285	12	9.78015	17	0.21985	9.93270	5	92
09	9.71297	13	9.78032	17	0.21968	9.93265	4	91
10	9.71310	12	9.78049	17	0.21951	9.93261	5	90
11	9.71322	13	9.78066	17	0.21934	9.93256	4	89
12	9.71335	13	9.78083	17	0.21917	9.93252	5	88
13	9.71348	12	9.78100	17	0.21900	9.93247	4	87
14	9.71360	13	9.78117	18	0.21883	9.93243	5	86
15	9.71373	12	9.78135	17	0.21865	9.93238	5	85
16	9.71385	13	9.78152	17	0.21848	9.93233	4	84
17	9.71398	12	9.78169	17	0.21831	9.93229	5	83
18	9.71410	13	9.78186	17	0.21814	9.93224	4	82
19	9.71423	12	9.78203	17	0.21797	9.93220	5	81
20	9.71435	13	9.78220	17	0.21780	9.93215	4	80
21	9.71448	12	9.78237	17	0.21763	9.93211	5	79
22	9.71460	13	9.78254	17	0.21746	9.93206	5	78
23	9.71473	12	9.78271	18	0.21729	9.93201	4	77
24	9.71485	13	9.78289	17	0.21711	9.93197	5	76
25	9.71498	12	9.78306	17	0.21694	9.93192	4	75
26	9.71510	13	9.78323	17	0.21677	9.93188	5	74
27	9.71523	12	9.78340	17	0.21660	9.93183	5	73
28	9.71535	13	9.78357	17	0.21643	9.93178	4	72
29	9.71548	12	9.78374	17	0.21626	9.93174	5	71
30	9.71560	13	9.78391	17	0.21609	9.93169	4	70
31	9.71573	12	9.78408	17	0.21592	9.93165	5	69
32	9.71585	13	9.78425	17	0.21575	9.93160	5	68
33	9.71598	12	9.78442	17	0.21558	9.93155	4	67
34	9.71610	12	9.78459	17	0.21541	9.93151	5	66
35	9.71622	13	9.78476	17	0.21524	9.93146	5	65
36	9.71635	12	9.78493	17	0.21507	9.93141	4	64
37	9.71647	13	9.78510	18	0.21490	9.93137	5	63
38	9.71660	12	9.78528	17	0.21472	9.93132	4	62
39	9.71672	13	9.78545	17	0.21455	9.93128	5	61
40	9.71685	12	9.78562	17	0.21438	9.93123	5	60
41	9.71697	12	9.78579	17	0.21421	9.93118	4	59
42	9.71709	13	9.78596	17	0.21404	9.93114	5	58
43	9.71722	12	9.78613	17	0.21387	9.93109	5	57
44	9.71734	13	9.78630	17	0.21370	9.93104	4	56
45	9.71747	12	9.78647	17	0.21353	9.93100	5	55
46	9.71759	12	9.78664	17	0.21336	9.93095	4	54
47	9.71771	13	9.78681	17	0.21319	9.93091	5	53
48	9.71784	12	9.78698	17	0.21302	9.93086	5	52
49	9.71796	13	9.78715	17	0.21285	9.93081	4	51
50	9.71809		9.78732		0.21268	9.93077		50
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.	

Prop. Pts.	
	18
1	1.8
2	3.6
3	5.4
4	7.2
5	9.0
6	10.8
7	12.6
8	14.4
9	16.2
	17
1	1.7
2	3.4
3	5.1
4	6.8
5	8.5
6	10.2
7	11.9
8	13.6
9	15.3
	13
1	1.3
2	2.6
3	3.9
4	5.2
5	6.5
6	7.8
7	9.1
8	10.4
9	11.7
	12
1	1.2
2	2.4
3	3.6
4	4.8
5	6.0
6	7.2
7	8.4
8	9.6
9	10.8
	4
1	0.4
2	0.8
3	1.2
4	1.6
5	2.0
6	2.4
7	2.8
8	3.2
9	3.6

Prop. Pts.

58°

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
				31°					
50	9.71809	12	9.78732	17	0.21268	9.93077	5	50	
51	9.71821	12	9.78749	17	0.21251	9.93072	5	49	17
52	9.71833	13	9.78766	17	0.21234	9.93067	4	48	1 1.7
53	9.71846	12	9.78783	17	0.21217	9.93063	5	47	2 3.4
54	9.71858	12	9.78800	17	0.21200	9.93058	5	46	3 5.1
55	9.71870	13	9.78817	17	0.21183	9.93053	4	45	4 6.8
56	9.71883	12	9.78834	17	0.21166	9.93049	5	44	5 8.5
57	9.71895	12	9.78851	17	0.21149	9.93044	5	43	6 10.2
58	9.71907	13	9.78868	17	0.21132	9.93039	4	42	7 11.9
59	9.71920	12	9.78885	17	0.21115	9.93035	5	41	8 13.6
60	9.71932	12	9.78902	17	0.21098	9.93030	5	40	9 15.3
61	9.71944	13	9.78919	17	0.21081	9.93025	4	39	16
62	9.71957	12	9.78936	17	0.21064	9.93021	5	38	1 1.6
63	9.71969	12	9.78953	17	0.21047	9.93016	5	37	2 3.2
64	9.71981	13	9.78970	17	0.21030	9.93011	4	36	3 4.8
65	9.71994	12	9.78987	17	0.21013	9.93007	5	35	4 6.4
66	9.72006	12	9.79004	17	0.20996	9.93002	5	34	5 8.0
67	9.72018	12	9.79021	17	0.20979	9.92997	4	33	6 9.6
68	9.72030	13	9.79038	17	0.20962	9.92993	5	32	7 11.2
69	9.72043	12	9.79055	17	0.20945	9.92988	5	31	8 12.8
70	9.72055	12	9.79072	17	0.20928	9.92983	4	30	9 14.4
71	9.72067	12	9.79089	17	0.20911	9.92979	5	29	13
72	9.72079	13	9.79106	16	0.20894	9.92974	5	28	1 1.3
73	9.72092	12	9.79122	17	0.20878	9.92969	4	27	2 2.6
74	9.72104	12	9.79139	17	0.20861	9.92965	5	26	3 3.9
75	9.72116	12	9.79156	17	0.20844	9.92960	5	25	4 5.2
76	9.72128	13	9.79173	17	0.20827	9.92955	4	24	5 6.5
77	9.72141	12	9.79190	17	0.20810	9.92951	5	23	6 7.8
78	9.72153	12	9.79207	17	0.20793	9.92946	5	22	7 9.1
79	9.72165	12	9.79224	17	0.20776	9.92941	5	21	8 10.4
80	9.72177	13	9.79241	17	0.20759	9.92936	4	20	9 11.7
81	9.72190	12	9.79258	17	0.20742	9.92932	5	19	12
82	9.72202	12	9.79275	17	0.20725	9.92927	5	18	1 1.2
83	9.72214	12	9.79292	17	0.20708	9.92922	4	17	2 2.4
84	9.72226	12	9.79309	17	0.20691	9.92918	5	16	3 3.6
85	9.72238	13	9.79326	17	0.20674	9.92913	5	15	4 4.8
86	9.72251	12	9.79343	16	0.20657	9.92908	5	14	5 6.0
87	9.72263	12	9.79359	17	0.20641	9.92903	4	13	6 7.2
88	9.72275	12	9.79376	17	0.20624	9.92899	5	12	7 8.4
89	9.72287	12	9.79393	17	0.20607	9.92894	5	11	8 9.6
90	9.72299	13	9.79410	17	0.20590	9.92889	4	10	9 10.8
91	9.72312	12	9.79427	17	0.20573	9.92885	5	09	5
92	9.72324	12	9.79444	17	0.20556	9.92880	5	08	1 0.5
93	9.72336	12	9.79461	17	0.20539	9.92875	5	07	2 1.0
94	9.72348	12	9.79478	17	0.20522	9.92870	4	06	3 1.5
95	9.72360	12	9.79495	16	0.20505	9.92866	5	05	4 2.0
96	9.72372	13	9.79511	17	0.20489	9.92861	5	04	5 2.5
97	9.72385	12	9.79528	17	0.20472	9.92856	4	03	6 3.0
98	9.72397	12	9.79545	17	0.20455	9.92852	5	02	7 3.5
99	9.72409	12	9.79562	17	0.20438	9.92847	5	01	8 4.0
100	9.72421		9.79579		0.20421	9.92842		00	9 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
				58°					

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					32°				
00	9.72421	12	9.79579	17	0.20421	9.92842	5	100	
01	9.72433	12	9.79596	17	0.20404	9.92837	4	99	17
02	9.72445	12	9.79613	17	0.20387	9.92833	5	98	1 1.7
03	9.72457	12	9.79630	16	0.20370	9.92828	5	97	2 3.4
04	9.72469	13	9.79646	17	0.20354	9.92823	5	96	3 5.1
05	9.72482	12	9.79663	17	0.20337	9.92818	4	95	4 6.8
06	9.72494	12	9.79680	17	0.20320	9.92814	5	94	5 8.5
07	9.72506	12	9.79697	17	0.20303	9.92809	5	93	6 10.2
08	9.72518	12	9.79714	17	0.20286	9.92804	5	92	7 11.9
09	9.72530	12	9.79731	16	0.20269	9.92799	4	91	8 13.6
10	9.72542	12	9.79747	17	0.20253	9.92795	5	90	9 15.3
11	9.72554	12	9.79764	17	0.20236	9.92790	5	89	16
12	9.72566	12	9.79781	17	0.20219	9.92785	5	88	1 1.6
13	9.72578	12	9.79798	17	0.20202	9.92780	4	87	2 3.2
14	9.72590	12	9.79815	17	0.20185	9.92776	5	86	3 4.8
15	9.72602	12	9.79832	16	0.20168	9.92771	5	85	4 6.4
16	9.72614	13	9.79848	17	0.20152	9.92766	5	84	5 8.0
17	9.72627	12	9.79865	17	0.20135	9.92761	5	83	6 9.6
18	9.72639	12	9.79882	17	0.20118	9.92756	4	82	7 11.2
19	9.72651	12	9.79899	17	0.20101	9.92752	5	81	8 12.8
20	9.72663	12	9.79916	16	0.20084	9.92747	5	80	9 14.4
21	9.72675	12	9.79932	17	0.20068	9.92742	5	79	13
22	9.72687	12	9.79949	17	0.20051	9.92737	4	78	1 1.3
23	9.72699	12	9.79966	17	0.20034	9.92733	5	77	2 2.6
24	9.72711	12	9.79983	17	0.20017	9.92728	5	76	3 3.9
25	9.72723	12	9.80000	16	0.20000	9.92723	5	75	4 5.2
26	9.72735	12	9.80016	17	0.19984	9.92718	5	74	5 6.5
27	9.72747	12	9.80033	17	0.19967	9.92713	4	73	6 7.8
28	9.72759	12	9.80050	17	0.19950	9.92709	5	72	7 9.1
29	9.72771	12	9.80067	17	0.19933	9.92704	5	71	8 10.4
30	9.72783	12	9.80084	16	0.19916	9.92699	5	70	9 11.7
31	9.72795	12	9.80100	17	0.19900	9.92694	4	69	12
32	9.72807	12	9.80117	17	0.19883	9.92690	5	68	1 1.2
33	9.72819	12	9.80134	17	0.19866	9.92685	5	67	2 2.4
34	9.72831	12	9.80151	17	0.19849	9.92680	5	66	3 3.6
35	9.72843	12	9.80168	16	0.19832	9.92675	5	65	4 4.8
36	9.72855	12	9.80184	17	0.19816	9.92670	4	64	5 6.0
37	9.72867	12	9.80201	17	0.19799	9.92666	5	63	6 7.2
38	9.72879	11	9.80218	17	0.19782	9.92661	5	62	7 8.4
39	9.72890	12	9.80235	16	0.19765	9.92656	5	61	8 9.6
40	9.72902	12	9.80251	17	0.19749	9.92651	5	60	9 10.8
41	9.72914	12	9.80268	17	0.19732	9.92646	5	59	
42	9.72926	12	9.80285	17	0.19715	9.92641	4	58	4
43	9.72938	12	9.80302	16	0.19698	9.92637	5	57	1 0.4
44	9.72950	12	9.80318	17	0.19682	9.92632	5	56	2 0.8
45	9.72962	12	9.80335	17	0.19665	9.92627	5	55	3 1.2
46	9.72974	12	9.80352	17	0.19648	9.92622	5	54	4 1.6
47	9.72986	12	9.80369	16	0.19631	9.92617	4	53	5 2.0
48	9.72998	12	9.80385	17	0.19615	9.92613	5	52	6 2.4
49	9.73010	12	9.80402	17	0.19598	9.92608	5	51	7 2.8
50	9.73022		9.80419		0.19581	9.92603		50	8 3.2
									9 3.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					57°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					32°				
50	9.73022	12	9.80419	16	0.19581	9.92603	5	50	
51	9.73034	11	9.80435	17	0.19565	9.92598	5	49	17
52	9.73045	12	9.80452	17	0.19548	9.92593	5	48	1 1.7
53	9.73057	12	9.80469	17	0.19531	9.92588	4	47	2 3.4
54	9.73069	12	9.80486	16	0.19514	9.92584	5	46	3 5.1
55	9.73081	12	9.80502	17	0.19498	9.92579	5	45	4 6.8
56	9.73093	12	9.80519	17	0.19481	9.92574	5	44	5 8.5
57	9.73105	12	9.80536	16	0.19464	9.92569	5	43	6 10.2
58	9.73117	12	9.80552	17	0.19448	9.92564	5	42	7 11.9
59	9.73129	11	9.80569	17	0.19431	9.92559	4	41	8 13.6
60	9.73140	12	9.80586	17	0.19414	9.92555	5	40	9 15.3
61	9.73152	12	9.80603	16	0.19397	9.92550	5	39	
62	9.73164	12	9.80619	17	0.19381	9.92545	5	38	16
63	9.73176	12	9.80636	17	0.19364	9.92540	5	37	1 1.6
64	9.73188	12	9.80653	16	0.19347	9.92535	5	36	2 3.2
65	9.73200	11	9.80669	17	0.19331	9.92530	5	35	3 4.8
66	9.73211	12	9.80686	17	0.19314	9.92525	4	34	4 6.4
67	9.73223	12	9.80703	16	0.19297	9.92521	5	33	5 8.0
68	9.73235	12	9.80719	17	0.19281	9.92516	5	32	6 9.6
69	9.73247	12	9.80736	17	0.19264	9.92511	5	31	7 11.2
70	9.73259	12	9.80753	16	0.19247	9.92506	5	30	8 12.8
71	9.73271	11	9.80769	17	0.19231	9.92501	5	29	9 14.4
72	9.73282	12	9.80786	17	0.19214	9.92496	5	28	
73	9.73294	12	9.80803	16	0.19197	9.92491	5	27	12
74	9.73306	12	9.80819	17	0.19181	9.92486	4	26	1 1.2
75	9.73318	11	9.80836	17	0.19164	9.92482	5	25	2 2.4
76	9.73329	12	9.80853	16	0.19147	9.92477	5	24	3 3.6
77	9.73341	12	9.80869	17	0.19131	9.92472	5	23	4 4.8
78	9.73353	12	9.80886	17	0.19114	9.92467	5	22	5 6.0
79	9.73365	12	9.80903	16	0.19097	9.92462	5	21	6 7.2
80	9.73377	11	9.80919	17	0.19081	9.92457	5	20	7 8.4
81	9.73388	12	9.80936	17	0.19064	9.92452	5	19	8 9.6
82	9.73400	12	9.80953	16	0.19047	9.92447	4	18	9 10.8
83	9.73412	12	9.80969	17	0.19031	9.92443	5	17	
84	9.73424	11	9.80986	17	0.19014	9.92438	5	16	11
85	9.73435	12	9.81003	16	0.18997	9.92433	5	15	1 1.1
86	9.73447	12	9.81019	17	0.18981	9.92428	5	14	2 2.2
87	9.73459	11	9.81036	16	0.18964	9.92423	5	13	3 3.3
88	9.73470	12	9.81052	17	0.18948	9.92418	5	12	4 4.4
89	9.73482	12	9.81069	17	0.18931	9.92413	5	11	5 5.5
90	9.73494	12	9.81086	16	0.18914	9.92408	5	10	6 6.6
91	9.73506	11	9.81102	17	0.18898	9.92403	5	09	7 7.7
92	9.73517	12	9.81119	17	0.18881	9.92398	4	08	8 8.8
93	9.73529	12	9.81136	16	0.18864	9.92394	5	07	9 9.9
94	9.73541	11	9.81152	17	0.18848	9.92389	5	06	5
95	9.73552	12	9.81169	16	0.18831	9.92384	5	05	1 0.5
96	9.73564	12	9.81185	17	0.18815	9.92379	5	04	2 1.0
97	9.73576	12	9.81202	17	0.18798	9.92374	5	03	3 1.5
98	9.73588	11	9.81219	16	0.18781	9.92369	5	02	4 2.0
99	9.73599	12	9.81235	17	0.18765	9.92364	5	01	5 2.5
100	9.73611		9.81252		0.18748	9.92359		00	6 3.0
									7 3.5
									8 4.0
									9 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					57°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

33°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.73611	12	9.81252	16	0.18748	9.92359	5	100	
01	9.73623	11	9.81268	17	0.18732	9.92354	5	99	17
02	9.73634	12	9.81285	17	0.18715	9.92349	5	98	1 | 1.7
03	9.73646	12	9.81302	16	0.18698	9.92344	5	97	2 | 3.4
									3 | 5.1
04	9.73658	11	9.81318	17	0.18682	9.92339	4	96	4 | 6.8
05	9.73669	12	9.81335	16	0.18665	9.92335	5	95	5 | 8.5
06	9.73681	11	9.81351	17	0.18649	9.92330	5	94	6 | 10.2
									7 | 11.9
07	9.73692	12	9.81368	16	0.18632	9.92325	5	93	8 | 13.6
08	9.73704	12	9.81384	17	0.18616	9.92320	5	92	9 | 15.3
09	9.73716	11	9.81401	17	0.18599	9.92315	5	91	
10	9.73727	12	9.81418	16	0.18582	9.92310	5	90	16
11	9.73739	12	9.81434	17	0.18566	9.92305	5	89	1 | 1.6
12	9.73751	11	9.81451	16	0.18549	9.92300	5	88	2 | 3.2
13	9.73762	12	9.81467	17	0.18533	9.92295	5	87	3 | 4.8
									4 | 6.4
14	9.73774	11	9.81484	16	0.18516	9.92290	5	86	5 | 8.0
15	9.73785	12	9.81500	17	0.18500	9.92285	5	85	6 | 9.6
16	9.73797	12	9.81517	16	0.18483	9.92280	5	84	7 | 11.2
									8 | 12.8
17	9.73809	11	9.81533	17	0.18467	9.92275	5	83	9 | 14.4
18	9.73820	12	9.81550	17	0.18450	9.92270	5	82	
19	9.73832	11	9.81567	16	0.18433	9.92265	5	81	
20	9.73843	12	9.81583	17	0.18417	9.92260	5	80	
21	9.73855	12	9.81600	16	0.18400	9.92255	5	79	12
22	9.73867	11	9.81616	17	0.18384	9.92250	5	78	1 | 1.2
23	9.73878	12	9.81633	16	0.18367	9.92245	5	77	2 | 2.4
									3 | 3.6
24	9.73890	11	9.81649	17	0.18351	9.92240	5	76	4 | 4.8
25	9.73901	12	9.81666	16	0.18334	9.92235	4	75	5 | 6.0
26	9.73913	11	9.81682	17	0.18318	9.92231	5	74	6 | 7.2
									7 | 8.4
27	9.73924	12	9.81699	16	0.18301	9.92226	5	73	8 | 9.6
28	9.73936	11	9.81715	17	0.18285	9.92221	5	72	9 | 10.8
29	9.73947	12	9.81732	16	0.18268	9.92216	5	71	
30	9.73959	12	9.81748	17	0.18252	9.92211	5	70	11
31	9.73971	11	9.81765	16	0.18235	9.92206	5	69	1 | 1.1
32	9.73982	12	9.81781	17	0.18219	9.92201	5	68	2 | 2.2
33	9.73994	11	9.81798	16	0.18202	9.92196	5	67	3 | 3.3
									4 | 4.4
34	9.74005	12	9.81814	17	0.18186	9.92191	5	66	5 | 5.5
35	9.74017	11	9.81831	16	0.18169	9.92186	5	65	6 | 6.6
36	9.74028	12	9.81847	17	0.18153	9.92181	5	64	7 | 7.7
									8 | 8.8
37	9.74040	11	9.81864	16	0.18136	9.92176	5	63	9 | 9.9
38	9.74051	12	9.81880	17	0.18120	9.92171	5	62	
39	9.74063	11	9.81897	16	0.18103	9.92166	5	61	
40	9.74074	12	9.81913	17	0.18087	9.92161	5	60	
41	9.74086	11	9.81930	16	0.18070	9.92156	5	59	5
42	9.74097	12	9.81946	17	0.18054	9.92151	5	58	1 | 0.5
43	9.74109	11	9.81963	16	0.18037	9.92146	5	57	2 | 1.0
									3 | 1.5
44	9.74120	12	9.81979	17	0.18021	9.92141	5	56	4 | 2.0
45	9.74132	11	9.81996	16	0.18004	9.92136	5	55	5 | 2.5
46	9.74143	12	9.82012	17	0.17988	9.92131	5	54	6 | 3.0
									7 | 3.5
47	9.74155	11	9.82029	16	0.17971	9.92126	5	53	8 | 4.0
48	9.74166	11	9.82045	17	0.17955	9.92121	5	52	9 | 4.5
49	9.74177	12	9.82062	16	0.17938	9.92116	5	51	
50	9.74189		9.82078		0.17922	9.92111		50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

33°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.74189	11	9.82078	17	0.17922	9.92111	5	50	
51	9.74200	12	9.82095	16	0.17905	9.92106	5	49	17
52	9.74212	11	9.82111	17	0.17889	9.92101	5	48	1 | 1.7
53	9.74223	12	9.82128	16	0.17872	9.92096	5	47	2 | 3.4
54	9.74235	11	9.82144	17	0.17856	9.92091	5	46	3 | 5.1
55	9.74246	12	9.82161	16	0.17839	9.92086	5	45	4 | 6.8
56	9.74258	11	9.82177	17	0.17823	9.92081	6	44	5 | 8.5
57	9.74269	11	9.82194	16	0.17806	9.92075	5	43	6 | 10.2
58	9.74280	12	9.82210	16	0.17790	9.92070	5	42	7 | 11.9
59	9.74292	11	9.82226	17	0.17774	9.92065	5	41	8 | 13.6
60	9.74303	12	9.82243	16	0.17757	9.92060	5	40	9 | 15.3
61	9.74315	11	9.82259	17	0.17741	9.92055	5	39	16
62	9.74326	11	9.82276	16	0.17724	9.92050	5	38	1 | 1.6
63	9.74337	12	9.82292	17	0.17708	9.92045	5	37	2 | 3.2
64	9.74349	11	9.82309	16	0.17691	9.92040	5	36	3 | 4.8
65	9.74360	12	9.82325	16	0.17675	9.92035	5	35	4 | 6.4
66	9.74372	11	9.82341	17	0.17659	9.92030	5	34	5 | 8.0
67	9.74383	11	9.82358	16	0.17642	9.92025	5	33	6 | 9.6
68	9.74394	12	9.82374	17	0.17626	9.92020	5	32	7 | 11.2
69	9.74406	11	9.82391	16	0.17609	9.92015	5	31	8 | 12.8
70	9.74417	11	9.82407	17	0.17593	9.92010	5	30	9 | 14.4
71	9.74428	12	9.82424	16	0.17576	9.92005	5	29	12
72	9.74440	11	9.82440	16	0.17560	9.92000	5	28	1 | 1.2
73	9.74451	12	9.82456	17	0.17544	9.91995	5	27	2 | 2.4
74	9.74463	11	9.82473	16	0.17527	9.91990	5	26	3 | 3.6
75	9.74474	11	9.82489	17	0.17511	9.91985	5	25	4 | 4.8
76	9.74485	12	9.82506	16	0.17494	9.91980	5	24	5 | 6.0
77	9.74497	11	9.82522	16	0.17478	9.91975	6	23	6 | 7.2
78	9.74508	11	9.82538	17	0.17462	9.91969	5	22	7 | 8.4
79	9.74519	12	9.82555	16	0.17445	9.91964	5	21	8 | 9.6
80	9.74531	11	9.82571	17	0.17429	9.91959	5	20	9 | 10.8
81	9.74542	11	9.82588	16	0.17412	9.91954	5	19	11
82	9.74553	12	9.82604	16	0.17396	9.91949	5	18	1 | 1.1
83	9.74565	11	9.82620	17	0.17380	9.91944	5	17	2 | 2.2
84	9.74576	11	9.82637	16	0.17363	9.91939	5	16	3 | 3.3
85	9.74587	11	9.82653	17	0.17347	9.91934	5	15	4 | 4.4
86	9.74598	12	9.82670	16	0.17330	9.91929	5	14	5 | 5.5
87	9.74610	11	9.82686	16	0.17314	9.91924	5	13	6 | 6.6
88	9.74621	11	9.82702	17	0.17298	9.91919	5	12	7 | 7.7
89	9.74632	12	9.82719	16	0.17281	9.91914	6	11	8 | 8.8
90	9.74644	11	9.82735	16	0.17265	9.91908	5	10	9 | 9.9
91	9.74655	11	9.82751	17	0.17249	9.91903	5	09	6
92	9.74666	11	9.82768	16	0.17232	9.91898	5	08	1 | 0.6
93	9.74677	12	9.82784	17	0.17216	9.91893	5	07	2 | 1.2
94	9.74689	11	9.82801	16	0.17199	9.91888	5	06	3 | 1.8
95	9.74700	11	9.82817	16	0.17183	9.91883	5	05	4 | 2.4
96	9.74711	11	9.82833	17	0.17167	9.91878	5	04	5 | 3.0
97	9.74722	12	9.82850	16	0.17150	9.91873	5	03	6 | 3.6
98	9.74734	11	9.82866	16	0.17134	9.91868	5	02	7 | 4.2
99	9.74745	11	9.82882	17	0.17118	9.91863	6	01	8 | 4.8
100	9.74756		9.82899		0.17101	9.91857		00	9 | 5.4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

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	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.74756	11	9.82899	16	0.17101	9.91857	5	100	
									17
01	9.74767	12	9.82915	16	0.17085	9.91852	5	99	
02	9.74779	11	9.82931	17	0.17069	9.91847	5	98	1 | 1.7
03	9.74790	11	9.82948	16	0.17052	9.91842	5	97	2 | 3.4
									3 | 5.1
04	9.74801	11	9.82964	16	0.17036	9.91837	5	96	4 | 6.8
05	9.74812	12	9.82980	17	0.17020	9.91832	5	95	5 | 8.5
06	9.74824	11	9.82997	16	0.17003	9.91827	5	94	6 | 10.2
									7 | 11.9
07	9.74835	11	9.83013	16	0.16987	9.91822	6	93	8 | 13.6
08	9.74846	11	9.83029	17	0.16971	9.91816	5	92	9 | 15.3
09	9.74857	11	9.83046	16	0.16954	9.91811	5	91	
10	9.74868	12	9.83062	16	0.16938	9.91806	5	90	16
11	9.74880	11	9.83078	17	0.16922	9.91801	5	89	1 | 1.6
12	9.74891	11	9.83095	16	0.16905	9.91796	5	88	2 | 3.2
13	9.74902	11	9.83111	16	0.16889	9.91791	5	87	3 | 4.8
									4 | 6.4
14	9.74913	11	9.83127	17	0.16873	9.91786	5	86	5 | 8.0
15	9.74924	11	9.83144	16	0.16856	9.91781	6	85	6 | 9.6
16	9.74935	12	9.83160	16	0.16840	9.91775	5	84	7 | 11.2
									8 | 12.8
17	9.74947	11	9.83176	17	0.16824	9.91770	5	83	9 | 14.4
18	9.74958	11	9.83193	16	0.16807	9.91765	5	82	
19	9.74969	11	9.83209	16	0.16791	9.91760	5	81	
20	9.74980	11	9.83225	17	0.16775	9.91755	5	80	
									12
21	9.74991	11	9.83242	16	0.16758	9.91750	6	79	
22	9.75002	12	9.83258	16	0.16742	9.91744	5	78	1 | 1.2
23	9.75014	11	9.83274	16	0.16726	9.91739	5	77	2 | 2.4
									3 | 3.6
24	9.75025	11	9.83290	17	0.16710	9.91734	5	76	4 | 4.8
25	9.75036	11	9.83307	16	0.16693	9.91729	5	75	5 | 6.0
26	9.75047	11	9.83323	16	0.16677	9.91724	5	74	6 | 7.2
									7 | 8.4
27	9.75058	11	9.83339	17	0.16661	9.91719	5	73	8 | 9.6
28	9.75069	11	9.83356	16	0.16644	9.91714	6	72	9 | 10.8
29	9.75080	11	9.83372	16	0.16628	9.91708	5	71	
30	9.75091	12	9.83388	17	0.16612	9.91703	5	70	11
31	9.75103	11	9.83405	16	0.16595	9.91698	5	69	1 | 1.1
32	9.75114	11	9.83421	16	0.16579	9.91693	5	68	2 | 2.2
33	9.75125	11	9.83437	16	0.16563	9.91688	6	67	3 | 3.3
									4 | 4.4
34	9.75136	11	9.83453	17	0.16547	9.91682	5	66	5 | 5.5
35	9.75147	11	9.83470	16	0.16530	9.91677	5	65	6 | 6.6
36	9.75158	11	9.83486	16	0.16514	9.91672	5	64	7 | 7.7
									8 | 8.8
37	9.75169	11	9.83502	16	0.16498	9.91667	5	63	9 | 9.9
38	9.75180	11	9.83518	17	0.16482	9.91662	5	62	
39	9.75191	11	9.83535	16	0.16465	9.91657	6	61	
40	9.75202	11	9.83551	16	0.16449	9.91651	5	60	
									5
41	9.75213	11	9.83567	16	0.16433	9.91646	5	59	
42	9.75224	12	9.83583	17	0.16417	9.91641	5	58	
43	9.75236	11	9.83600	16	0.16400	9.91636	5	57	1 | 0.5
									2 | 1.0
44	9.75247	11	9.83616	16	0.16384	9.91631	6	56	3 | 1.5
45	9.75258	11	9.83632	16	0.16368	9.91625	5	55	4 | 2.0
46	9.75269	11	9.83648	17	0.16352	9.91620	5	54	5 | 2.5
									6 | 3.0
47	9.75280	11	9.83665	16	0.16335	9.91615	5	53	7 | 3.5
48	9.75291	11	9.83681	16	0.16319	9.91610	5	52	8 | 4.0
49	9.75302	11	9.83697	16	0.16303	9.91605	6	51	9 | 4.5
50	9.75313		9.83713		0.16287	9.91599		50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

34°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.75313	11	9.83713	17	0.16287	9.91599	5	50	
51	9.75324	11	9.83730	16	0.16270	9.91594	5	49	17
52	9.75335	11	9.83746	16	0.16254	9.91589	5	48	1 1.7
53	9.75346	11	9.83762	16	0.16238	9.91584	5	47	2 3.4
54	9.75357	11	9.83778	17	0.16222	9.91579	6	46	3 5.1
55	9.75368	11	9.83795	16	0.16205	9.91573	5	45	4 6.8
56	9.75379	11	9.83811	16	0.16189	9.91568	5	44	5 8.5
57	9.75390	11	9.83827	16	0.16173	9.91563	5	43	6 10.2
58	9.75401	11	9.83843	16	0.16157	9.91558	6	42	7 11.9
59	9.75412	11	9.83859	17	0.16141	9.91552	5	41	8 13.6
60	9.75423	11	9.83876	16	0.16124	9.91547	5	40	9 15.3
61	9.75434	11	9.83892	16	0.16108	9.91542	5	39	16
62	9.75445	11	9.83908	16	0.16092	9.91537	6	38	1 1.6
63	9.75456	11	9.83924	17	0.16076	9.91531	5	37	2 3.2
64	9.75467	11	9.83941	16	0.16059	9.91526	5	36	3 4.8
65	9.75478	11	9.83957	16	0.16043	9.91521	5	35	4 6.4
66	9.75489	11	9.83973	16	0.16027	9.91516	5	34	5 8.0
67	9.75500	11	9.83989	16	0.16011	9.91511	6	33	6 9.6
68	9.75511	11	9.84005	17	0.15995	9.91505	5	32	7 11.2
69	9.75522	11	9.84022	16	0.15978	9.91500	5	31	8 12.8
70	9.75533	11	9.84038	16	0.15962	9.91495	5	30	9 14.4
71	9.75544	10	9.84054	16	0.15946	9.91490	6	29	
72	9.75554	11	9.84070	16	0.15930	9.91484	5	28	11
73	9.75565	11	9.84086	17	0.15914	9.91479	5	27	1 1.1
74	9.75576	11	9.84103	16	0.15897	9.91474	5	26	2 2.2
75	9.75587	11	9.84119	16	0.15881	9.91469	6	25	3 3.3
76	9.75598	11	9.84135	16	0.15865	9.91463	5	24	4 4.4
77	9.75609	11	9.84151	16	0.15849	9.91458	5	23	5 5.5
78	9.75620	11	9.84167	16	0.15833	9.91453	6	22	6 6.6
79	9.75631	11	9.84183	17	0.15817	9.91447	5	21	7 7.7
80	9.75642	11	9.84200	16	0.15800	9.91442	5	20	8 8.8
81	9.75653	11	9.84216	16	0.15784	9.91437	5	19	9 9.9
82	9.75664	11	9.84232	16	0.15768	9.91432	6	18	10
83	9.75675	10	9.84248	16	0.15752	9.91426	5	17	1 1.0
84	9.75685	11	9.84264	16	0.15736	9.91421	5	16	2 2.0
85	9.75696	11	9.84280	17	0.15720	9.91416	5	15	3 3.0
86	9.75707	11	9.84297	16	0.15703	9.91411	6	14	4 4.0
87	9.75718	11	9.84313	16	0.15687	9.91405	5	13	5 5.0
88	9.75729	11	9.84329	16	0.15671	9.91400	5	12	6 6.0
89	9.75740	11	9.84345	16	0.15655	9.91395	6	11	7 7.0
90	9.75751	11	9.84361	16	0.15639	9.91389	5	10	8 8.0
91	9.75762	10	9.84377	17	0.15623	9.91384	5	09	9 9.0
92	9.75772	11	9.84394	16	0.15606	9.91379	5	08	
93	9.75783	11	9.84410	16	0.15590	9.91374	6	07	6
94	9.75794	11	9.84426	16	0.15574	9.91368	5	06	1 0.6
95	9.75805	11	9.84442	16	0.15558	9.91363	5	05	2 1.2
96	9.75816	11	9.84458	16	0.15542	9.91358	6	04	3 1.8
97	9.75827	10	9.84474	16	0.15526	9.91352	5	03	4 2.4
98	9.75837	11	9.84490	17	0.15510	9.91347	5	02	5 3.0
99	9.75848	11	9.84507	16	0.15493	9.91342	6	01	6 3.6
100	9.75859		9.84523		0.15747	9.91336		00	7 4.2
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		8 4.8
					55°		7°		Prop. Pts. 9 5.4

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TABLE LII.—*Common logarithms of circular functions*—Continued

35°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.75859	11	9.84523	16	0.15477	9.91336	5	100	
01	9.75870	11	9.84539	16	0.15461	9.91331	5	99	17
02	9.75881	11	9.84555	16	0.15445	9.91326	5	98	1 1.7
03	9.75892	10	9.84571	16	0.15429	9.91321	6	97	2 3.4
04	9.75902	11	9.84587	16	0.15413	9.91315	5	96	3 5.1
05	9.75913	11	9.84603	16	0.15397	9.91310	5	95	4 6.8
06	9.75924	11	9.84619	17	0.15381	9.91305	6	94	5 8.5
07	9.75935	11	9.84636	16	0.15364	9.91299	5	93	6 10.2
08	9.75946	10	9.84652	16	0.15348	9.91294	5	92	7 11.9
09	9.75956	11	9.84668	16	0.15332	9.91289	6	91	8 13.6
10	9.75967	11	9.84684	16	0.15316	9.91283	5	90	9 15.3
11	9.75978	11	9.84700	16	0.15300	9.91278	5	89	16
12	9.75989	11	9.84716	16	0.15284	9.91273	6	88	1 1.6
13	9.76000	10	9.84732	16	0.15268	9.91267	5	87	2 3.2
14	9.76010	11	9.84748	16	0.15252	9.91262	5	86	3 4.8
15	9.76021	11	9.84764	17	0.15236	9.91257	6	85	4 6.4
16	9.76032	11	9.84781	16	0.15219	9.91251	5	84	5 8.0
17	9.76043	10	9.84797	16	0.15203	9.91246	5	83	6 9.6
18	9.76053	11	9.84813	16	0.15187	9.91241	6	82	7 11.2
19	9.76064	11	9.84829	16	0.15171	9.91235	5	81	8 12.8
20	9.76075	11	9.84845	16	0.15155	9.91230	5	80	9 14.4
21	9.76086	10	9.84861	16	0.15139	9.91225	6	79	11
22	9.76096	11	9.84877	16	0.15123	9.91219	5	78	1 1.1
23	9.76107	11	9.84893	16	0.15107	9.91214	5	77	2 2.2
24	9.76118	11	9.84909	16	0.15091	9.91209	6	76	3 3.3
25	9.76129	10	9.84925	16	0.15075	9.91203	5	75	4 4.4
26	9.76139	11	9.84941	17	0.15059	9.91198	6	74	5 5.5
27	9.76150	11	9.84958	16	0.15042	9.91192	5	73	6 6.6
28	9.76161	10	9.84974	16	0.15026	9.91187	5	72	7 7.7
29	9.76171	11	9.84990	16	0.15010	9.91182	6	71	8 8.8
30	9.76182	11	9.85006	16	0.14994	9.91176	5	70	9 9.9
31	9.76193	10	9.85022	16	0.14978	9.91171	5	69	10
32	9.76203	11	9.85038	16	0.14962	9.91166	6	68	1 1.0
33	9.76214	11	9.85054	16	0.14946	9.91160	5	67	2 2.0
34	9.76225	11	9.85070	16	0.14930	9.91155	6	66	3 3.0
35	9.76236	10	9.85086	16	0.14914	9.91149	5	65	4 4.0
36	9.76246	11	9.85102	16	0.14898	9.91144	5	64	5 5.0
37	9.76257	11	9.85118	16	0.14882	9.91139	6	63	6 6.0
38	9.76268	10	9.85134	16	0.14866	9.91133	5	62	7 7.0
39	9.76278	11	9.85150	16	0.14850	9.91128	5	61	8 8.0
40	9.76289	11	9.85166	16	0.14834	9.91123	6	60	9 9.0
41	9.76300	10	9.85182	16	0.14818	9.91117	5	59	5
42	9.76310	11	9.85198	17	0.14802	9.91112	6	58	1 0.5
43	9.76321	11	9.85215	16	0.14785	9.91106	5	57	2 1.0
44	9.76332	10	9.85231	16	0.14769	9.91101	5	56	3 1.5
45	9.76342	11	9.85247	16	0.14753	9.91096	6	55	4 2.0
46	9.76353	11	9.85263	16	0.14737	9.91090	5	54	5 2.5
47	9.76364	10	9.85279	16	0.14721	9.91085	6	53	6 3.0
48	9.76374	11	9.85295	16	0.14705	9.91079	5	52	7 3.5
49	9.76385	10	9.85311	16	0.14689	9.91074	5	51	8 4.0
50	9.76395		9.85327		0.14673	9.91069		50	9 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

35°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.76395	11	9.85327	16	0.14673	9.91069	6	50	
51	9.76406	11	9.85343	16	0.14657	9.91063	5	49	16
52	9.76417	10	9.85359	16	0.14641	9.91058	6	48	1 1.6
53	9.76427	11	9.85375	16	0.14625	9.91052	5	47	2 3.2
54	9.76438	10	9.85391	16	0.14609	9.91047	5	46	3 4.8
55	9.76448	11	9.85407	16	0.14593	9.91042	6	45	4 6.4
56	9.76459	11	9.85423	16	0.14577	9.91036	5	44	5 8.0
57	9.76470	10	9.85439	16	0.14561	9.91031	6	43	6 9.6
58	9.76480	11	9.85455	16	0.14545	9.91025	5	42	7 11.2
59	9.76491	10	9.85471	16	0.14529	9.91020	6	41	8 12.8
60	9.76501	11	9.85487	16	0.14513	9.91014	5	40	9 14.4
61	9.76512	11	9.85503	16	0.14497	9.91009	5	39	15
62	9.76523	10	9.85519	16	0.14481	9.91004	6	38	1 1.5
63	9.76533	11	9.85535	16	0.14465	9.90998	5	37	2 3.0
64	9.76544	10	9.85551	16	0.14449	9.90993	6	36	3 4.5
65	9.76554	11	9.85567	16	0.14433	9.90987	5	35	4 6.0
66	9.76565	10	9.85583	16	0.14417	9.90982	6	34	5 7.5
67	9.76575	11	9.85599	16	0.14401	9.90976	5	33	6 9.0
68	9.76586	11	9.85615	16	0.14385	9.90971	5	32	7 10.5
69	9.76597	10	9.85631	16	0.14369	9.90966	6	31	8 12.0
70	9.76607	11	9.85647	16	0.14353	9.90960	5	30	9 13.5
71	9.76618	10	9.85663	16	0.14337	9.90955	6	29	11
72	9.76628	11	9.85679	16	0.14321	9.90949	5	28	1 1.1
73	9.76639	10	9.85695	16	0.14305	9.90944	6	27	2 2.2
74	9.76649	11	9.85711	16	0.14289	9.90938	5	26	3 3.3
75	9.76660	10	9.85727	16	0.14273	9.90933	6	25	4 4.4
76	9.76670	11	9.85743	16	0.14257	9.90927	5	24	5 5.5
77	9.76681	10	9.85759	16	0.14241	9.90922	6	23	6 6.6
78	9.76691	11	9.85775	16	0.14225	9.90916	5	22	7 7.7
79	9.76702	10	9.85791	16	0.14209	9.90911	5	21	8 8.8
80	9.76712	11	9.85807	16	0.14193	9.90906	6	20	9 9.9
81	9.76723	10	9.85823	16	0.14177	9.90900	5	19	10
82	9.76733	11	9.85839	16	0.14161	9.90895	6	18	1 1.0
83	9.76744	10	9.85855	16	0.14145	9.90889	5	17	2 2.0
84	9.76754	11	9.85871	16	0.14129	9.90884	6	16	3 3.0
85	9.76765	10	9.85887	16	0.14113	9.90878	5	15	4 4.0
86	9.76775	11	9.85903	16	0.14097	9.90873	6	14	5 5.0
87	9.76786	10	9.85919	16	0.14081	9.90867	5	13	6 6.0
88	9.76796	11	9.85935	16	0.14065	9.90862	6	12	7 7.0
89	9.76807	10	9.85951	16	0.14049	9.90856	5	11	8 8.0
90	9.76817	11	9.85967	16	0.14033	9.90851	6	10	9 9.0
91	9.76828	10	9.85983	16	0.14017	9.90845	5	09	6
92	9.76838	11	9.85999	15	0.14001	9.90840	6	08	1 0.6
93	9.76849	10	9.86014	16	0.13986	9.90834	5	07	2 1.2
94	9.76859	11	9.86030	16	0.13970	9.90829	6	06	3 1.8
95	9.76870	10	9.86046	16	0.13954	9.90823	5	05	4 2.4
96	9.76880	11	9.86062	16	0.13938	9.90818	6	04	5 3.0
97	9.76891	10	9.86078	16	0.13922	9.90812	5	03	6 3.6
98	9.76901	10	9.86094	16	0.13906	9.90807	6	02	7 4.2
99	9.76911	11	9.86110	16	0.13890	9.90801	5	01	8 4.8
100	9.76922		9.86126		0.13874	9.90796		00	9 5.4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					36°				
00	9.76922	10	9.86126	16	0.13874	9.90796	6	100	16
01	9.76932	11	9.86142	16	0.13858	9.90790	5	99	1 1.6
02	9.76943	10	9.86158	16	0.13842	9.90785	6	98	2 3.2
03	9.76953	11	9.86174	16	0.13826	9.90779	5	97	3 4.8
04	9.76964	10	9.86190	16	0.13810	9.90774	6	96	4 6.4
05	9.76974	10	9.86206	16	0.13794	9.90768	5	95	5 8.0
06	9.76984	11	9.86222	16	0.13778	9.90763	6	94	6 9.6
07	9.76995	10	9.86238	16	0.13762	9.90757	5	93	7 11.2
08	9.77005	11	9.86254	15	0.13746	9.90752	6	92	8 12.8
09	9.77016	10	9.86269	16	0.13731	9.90746	5	91	9 14.4
10	9.77026	10	9.86285	16	0.13715	9.90741	6	90	15
11	9.77036	11	9.86301	16	0.13699	9.90735	5	89	1 1.5
12	9.77047	10	9.86317	16	0.13683	9.90730	6	88	2 3.0
13	9.77057	11	9.86333	16	0.13667	9.90724	6	87	3 4.5
14	9.77068	10	9.86349	16	0.13651	9.90718	5	86	4 6.0
15	9.77078	10	9.86365	16	0.13635	9.90713	6	85	5 7.5
16	9.77088	11	9.86381	16	0.13619	9.90707	5	84	6 9.0
17	9.77099	10	9.86397	16	0.13603	9.90702	6	83	7 10.5
18	9.77109	10	9.86413	16	0.13587	9.90696	5	82	8 12.0
19	9.77119	11	9.86429	16	0.13571	9.90691	6	81	9 13.5
20	9.77130	10	9.86445	15	0.13555	9.90685	5	80	11
21	9.77140	10	9.86460	16	0.13540	9.90680	6	79	1 1.1
22	9.77150	11	9.86476	16	0.13524	9.90674	5	78	2 2.2
23	9.77161	10	9.86492	16	0.13508	9.90669	6	77	3 3.3
24	9.77171	10	9.86508	16	0.13492	9.90663	6	76	4 4.4
25	9.77181	11	9.86524	16	0.13476	9.90657	5	75	5 5.5
26	9.77192	10	9.86540	16	0.13460	9.90652	6	74	6 6.6
27	9.77202	10	9.86556	16	0.13444	9.90646	5	73	7 7.7
28	9.77212	11	9.86572	16	0.13428	9.90641	6	72	8 8.8
29	9.77223	10	9.86588	15	0.13412	9.90635	5	71	9 9.9
30	9.77233	10	9.86603	16	0.13397	9.90630	6	70	10
31	9.77243	11	9.86619	16	0.13381	9.90624	6	69	1 1.0
32	9.77254	10	9.86635	16	0.13365	9.90618	5	68	2 2.0
33	9.77264	10	9.86651	16	0.13349	9.90613	6	67	3 3.0
34	9.77274	11	9.86667	16	0.13333	9.90607	5	66	4 4.0
35	9.77285	10	9.86683	16	0.13317	9.90602	6	65	6 5.0
36	9.77295	10	9.86699	16	0.13301	9.90596	5	64	6 6.0
37	9.77305	11	9.86715	16	0.13285	9.90591	6	63	7 7.0
38	9.77316	10	9.86731	15	0.13269	9.90585	6	62	8 8.0
39	9.77326	10	9.86746	16	0.13254	9.90579	5	61	9 9.0
40	9.77336	10	9.86762	16	0.13238	9.90574	6	60	5
41	9.77346	11	9.86778	16	0.13222	9.90568	5	59	1 0.5
42	9.77357	10	9.86794	16	0.13206	9.90563	6	58	2 1.0
43	9.77367	10	9.86810	16	0.13190	9.90557	6	57	3 1.5
44	9.77377	10	9.86826	16	0.13174	9.90551	5	56	4 2.0
45	9.77387	11	9.86842	15	0.13158	9.90546	6	55	5 2.5
46	9.77398	10	9.86857	16	0.13143	9.90540	5	54	6 3.0
47	9.77408	10	9.86873	16	0.13127	9.90535	6	53	7 3.5
48	9.77418	11	9.86889	16	0.13111	9.90529	6	52	8 4.0
49	9.77429	10	9.86905	16	0.13095	9.90523	5	51	9 4.5
50	9.77439		9.86921		0.13079	9.90518		50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					53°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

36°									
	Sin	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.77439	10	9.86921	16	0.13079	9.90518	6	50	
51	9.77449	10	9.86937	16	0.13063	9.90512	5	49	16
52	9.77459	10	9.86953	15	0.13047	9.90507	6	48	1 1.6
53	9.77469	11	9.86968	16	0.13032	9.90501	6	47	2 3.2
54	9.77480	10	9.86984	16	0.13016	9.90495	5	46	3 4.8
55	9.77490	10	9.87000	16	0.13000	9.90490	6	45	4 6.4
56	9.77500	10	9.87016	16	0.12984	9.90484	5	44	5 8.0
57	9.77510	11	9.87032	16	0.12968	9.90479	6	43	6 9.6
58	9.77521	10	9.87048	15	0.12952	9.90473	6	42	7 11.2
59	9.77531	10	9.87063	16	0.12937	9.90467	5	41	8 12.8
60	9.77541	10	9.87079	16	0.12921	9.90462	6	40	9 14.4
61	9.77551	10	9.87095	16	0.12905	9.90456	6	39	15
62	9.77561	11	9.87111	16	0.12889	9.90450	5	38	1 1.5
63	9.77572	10	9.87127	16	0.12873	9.90445	6	37	2 3.0
64	9.77582	10	9.87143	15	0.12857	9.90439	5	36	3 4.5
65	9.77592	10	9.87158	16	0.12842	9.90434	6	35	4 6.0
66	9.77602	10	9.87174	16	0.12826	9.90428	6	34	5 7.5
67	9.77612	11	9.87190	16	0.12810	9.90422	5	33	6 9.0
68	9.77623	10	9.87206	16	0.12794	9.90417	6	32	7 10.5
69	9.77633	10	9.87222	16	0.12778	9.90411	6	31	8 12.0
70	9.77643	10	9.87238	15	0.12762	9.90405	5	30	9 13.5
71	9.77653	10	9.87253	16	0.12747	9.90400	6	29	11
72	9.77663	10	9.87269	16	0.12731	9.90394	6	28	1 1.1
73	9.77673	11	9.87285	16	0.12715	9.90388	5	27	2 2.2
74	9.77684	10	9.87301	16	0.12699	9.90383	6	26	3 3.3
75	9.77694	10	9.87317	15	0.12683	9.90377	6	25	4 4.4
76	9.77704	10	9.87332	16	0.12668	9.90371	5	24	5 5.5
77	9.77714	10	9.87348	16	0.12652	9.90366	6	23	6 6.6
78	9.77724	10	9.87364	16	0.12636	9.90360	6	22	7 7.7
79	9.77734	10	9.87380	16	0.12620	9.90354	5	21	8 8.8
80	9.77744	11	9.87396	16	0.12604	9.90349	6	20	9 9.9
81	9.77755	10	9.87412	15	0.12588	9.90343	6	19	10
82	9.77765	10	9.87427	16	0.12573	9.90337	5	18	1 1.0
83	9.77775	10	9.87443	16	0.12557	9.90332	6	17	2 2.0
84	9.77785	10	9.87459	16	0.12541	9.90326	6	16	3 3.0
85	9.77795	10	9.87475	15	0.12525	9.90320	5	15	4 4.0
86	9.77805	10	9.87490	16	0.12510	9.90315	6	14	5 5.0
87	9.77815	10	9.87506	16	0.12494	9.90309	6	13	6 6.0
88	9.77825	10	9.87522	16	0.12478	9.90303	5	12	7 7.0
89	9.77835	11	9.87538	16	0.12462	9.90298	6	11	8 8.0
90	9.77846	10	9.87554	15	0.12446	9.90292	6	10	9 9.0
91	9.77856	10	9.87569	16	0.12431	9.90286	6	09	6
92	9.77866	10	9.87585	16	0.12415	9.90280	5	08	1 0.6
93	9.77876	10	9.87601	16	0.12399	9.90275	6	07	2 1.2
94	9.77886	10	9.87617	16	0.12383	9.90269	6	06	3 1.8
95	9.77896	10	9.87633	15	0.12367	9.90263	5	05	4 2.4
96	9.77906	10	9.87648	16	0.12352	9.90258	6	04	5 3.0
97	9.77916	10	9.87664	16	0.12336	9.90252	6	03	6 3.6
98	9.77926	10	9.87680	16	0.12320	9.90246	5	02	7 4.2
99	9.77936	10	9.87696	15	0.12304	9.90241	6	01	8 4.8
100	9.77946		9.87711		0.12289	9.90235		00	9 5.4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
53°									

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					37°				
00	9.77946	10	9.87711	16	0.12289	9.90235	6	100	
01	9.77956	10	9.87727	16	0.12273	9.90229	6	99	16
02	9.77966	10	9.87743	16	0.12257	9.90223	5	98	1 | 1.6
03	9.77976	11	9.87759	16	0.12241	9.90218	6	97	2 | 3.2
04	9.77987	10	9.87775	15	0.12225	9.90212	6	96	3 | 4.8
05	9.77997	10	9.87790	16	0.12210	9.90206	5	95	4 | 6.4
06	9.78007	10	9.87806	16	0.12194	9.90201	6	94	5 | 8.0
07	9.78017	10	9.87822	16	0.12178	9.90195	6	93	6 | 9.6
08	9.78027	10	9.87838	15	0.12162	9.90189	6	92	7 | 11.2
09	9.78037	10	9.87853	16	0.12147	9.90183	5	91	8 | 12.8
10	9.78047	10	9.87869	16	0.12131	9.90178	6	90	9 | 14.4
11	9.78057	10	9.87885	16	0.12115	9.90172	6	89	15
12	9.78067	10	9.87901	15	0.12099	9.90166	6	88	1 | 1.5
13	9.78077	10	9.87916	16	0.12084	9.90160	5	87	2 | 3.0
14	9.78087	10	9.87932	16	0.12068	9.90155	6	86	3 | 4.5
15	9.78097	10	9.87948	16	0.12052	9.90149	6	85	4 | 6.0
16	9.78107	10	9.87964	15	0.12036	9.90143	6	84	5 | 7.5
17	9.78117	10	9.87979	16	0.12021	9.90137	5	83	6 | 9.0
18	9.78127	10	9.87995	16	0.12005	9.90132	6	82	7 | 10.5
19	9.78137	10	9.88011	16	0.11989	9.90126	6	81	8 | 12.0
20	9.78147	10	9.88027	15	0.11973	9.90120	6	80	9 | 13.5
21	9.78157	10	9.88042	16	0.11958	9.90114	5	79	11
22	9.78167	10	9.88058	16	0.11942	9.90109	6	78	1 | 1.1
23	9.78177	10	9.88074	15	0.11926	9.90103	6	77	2 | 2.2
24	9.78187	10	9.88089	16	0.11911	9.90097	6	76	3 | 3.3
25	9.78197	10	9.88105	16	0.11895	9.90091	5	75	4 | 4.4
26	9.78207	10	9.88121	16	0.11879	9.90086	6	74	5 | 5.5
27	9.78217	10	9.88137	15	0.11863	9.90080	6	73	6 | 6.6
28	9.78227	9	9.88152	16	0.11848	9.90074	6	72	7 | 7.7
29	9.78236	10	9.88168	16	0.11832	9.90068	5	71	8 | 8.8
30	9.78246	10	9.88184	16	0.11816	9.90063	6	70	9 | 9.9
31	9.78256	10	9.88200	15	0.11800	9.90057	6	69	9
32	9.78266	10	9.88215	16	0.11785	9.90051	6	68	1 | 0.9
33	9.78276	10	9.88231	16	0.11769	9.90045	6	67	2 | 1.8
34	9.78286	10	9.88247	15	0.11753	9.90039	5	66	3 | 2.7
35	9.78296	10	9.88262	16	0.11738	9.90034	6	65	4 | 3.6
36	9.78306	10	9.88278	16	0.11722	9.90028	6	64	5 | 4.5
37	9.78316	10	9.88294	16	0.11706	9.90022	6	63	6 | 5.4
38	9.78326	10	9.88310	15	0.11690	9.90016	5	62	7 | 6.3
39	9.78336	10	9.88325	16	0.11675	9.90011	6	61	8 | 7.2
40	9.78346	10	9.88341	16	0.11659	9.90005	6	60	9 | 8.1
41	9.78356	10	9.88357	15	0.11643	9.89999	6	59	5
42	9.78366	9	9.88372	16	0.11628	9.89993	6	58	1 | 0.5
43	9.78375	10	9.88388	16	0.11612	9.89987	5	57	2 | 1.0
44	9.78385	10	9.88404	16	0.11596	9.89982	6	56	3 | 1.5
45	9.78395	10	9.88420	15	0.11580	9.89976	6	55	4 | 2.0
46	9.78405	10	9.88435	16	0.11565	9.89970	6	54	5 | 2.5
47	9.78415	10	9.88451	16	0.11549	9.89964	6	53	6 | 3.0
48	9.78425	10	9.88467	15	0.11533	9.89958	6	52	7 | 3.5
49	9.78435	10	9.88482	16	0.11518	9.89952	5	51	8 | 4.0
50	9.78445		9.88498		0.11502	9.89947		50	9 | 4.5
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					52°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

37°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.	
50	9.78445	10	9.88498	16	0.11502	9.89947	6	50
51	9.78455	9	9.88514	15	0.11486	9.89941	6	49
52	9.78464	10	9.88529	16	0.11471	9.89935	6	48
53	9.78474	10	9.88545	16	0.11455	9.89929	6	47
54	9.78484	10	9.88561	16	0.11439	9.89923	5	46
55	9.78494	10	9.88577	15	0.11423	9.89918	6	45
56	9.78504	10	9.88592	16	0.11408	9.89912	6	44
57	9.78514	10	9.88608	16	0.11392	9.89906	6	43
58	9.78524	9	9.88624	15	0.11376	9.89900	6	42
59	9.78533	10	9.88639	16	0.11361	9.89894	6	41
60	9.78543	10	9.88655	16	0.11345	9.89888	5	40
61	9.78553	10	9.88671	15	0.11329	9.89883	6	39
62	9.78563	10	9.88686	16	0.11314	9.89877	6	38
63	9.78573	10	9.88702	16	0.11298	9.89871	6	37
64	9.78583	9	9.88718	15	0.11282	9.89865	6	36
65	9.78592	10	9.88733	16	0.11267	9.89859	6	35
66	9.78602	10	9.88749	16	0.11251	9.89853	6	34
67	9.78612	10	9.88765	15	0.11235	9.89847	5	33
68	9.78622	10	9.88780	16	0.11220	9.89842	6	32
69	9.78632	10	9.88796	16	0.11204	9.89836	6	31
70	9.78642	9	9.88812	15	0.11188	9.89830	6	30
71	9.78651	10	9.88827	16	0.11173	9.89824	6	29
72	9.78661	10	9.88843	16	0.11157	9.89818	6	28
73	9.78671	10	9.88859	15	0.11141	9.89812	6	27
74	9.78681	10	9.88874	16	0.11126	9.89806	5	26
75	9.78691	9	9.88890	16	0.11110	9.89801	6	25
76	9.78700	10	9.88906	15	0.11094	9.89795	6	24
77	9.78710	10	9.88921	16	0.11079	9.89789	6	23
78	9.78720	10	9.88937	16	0.11063	9.89783	6	22
79	9.78730	9	9.88953	15	0.11047	9.89777	6	21
80	9.78739	10	9.88968	16	0.11032	9.89771	6	20
81	9.78749	10	9.88984	16	0.11016	9.89765	6	19
82	9.78759	10	9.89000	15	0.11000	9.89759	5	18
83	9.78769	10	9.89015	16	0.10985	9.89754	6	17
84	9.78779	9	9.89031	15	0.10969	9.89748	6	16
85	9.78788	10	9.89046	16	0.10954	9.89742	6	15
86	9.78798	10	9.89062	16	0.10938	9.89736	6	14
87	9.78808	10	9.89078	15	0.10922	9.89730	6	13
88	9.78818	9	9.89093	16	0.10907	9.89724	6	12
89	9.78827	10	9.89109	16	0.10891	9.89718	6	11
90	9.78837	10	9.89125	15	0.10875	9.89712	6	10
91	9.78847	9	9.89140	16	0.10860	9.89706	5	09
92	9.78856	10	9.89156	16	0.10844	9.89701	6	08
93	9.78866	10	9.89172	15	0.10828	9.89695	6	07
94	9.78876	10	9.89187	16	0.10813	9.89689	6	06
95	9.78886	9	9.89203	15	0.10797	9.89683	6	05
96	9.78895	10	9.89218	16	0.10782	9.89677	6	04
97	9.78905	10	9.89234	16	0.10766	9.89671	6	03
98	9.78915	9	9.89250	15	0.10750	9.89665	6	02
99	9.78924	10	9.89265	16	0.10735	9.89659	6	01
100	9.78934		9.89281		0.10719	9.89653		00
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.	
52°								

Prop. Pts.	
	16
1	1.6
2	3.2
3	4.8
4	6.4
5	8.0
6	9.6
7	11.2
8	12.8
9	14.4
	15
1	1.5
2	3.0
3	4.5
4	6.0
5	7.5
6	9.0
7	10.5
8	12.0
9	13.5
	10
1	1.0
2	2.0
3	3.0
4	4.0
5	5.0
6	6.0
7	7.0
8	8.0
9	9.0
	9
1	0.9
2	1.8
3	2.7
4	3.6
5	4.5
6	5.4
7	6.3
8	7.2
9	8.1
	6
1	0.6
2	1.2
3	1.8
4	2.4
5	3.0
6	3.6
7	4.2
8	4.8
9	5.4

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					38°				
00	9.78934	10	9.89281	16	0.10719	9.89653	6	100	
01	9.78944	10	9.89297	15	0.10703	9.89647	6	99	16
02	9.78954	9	9.89312	16	0.10688	9.89641	6	98	1 1.6
03	9.78963	10	9.89328	15	0.10672	9.89635	5	97	2 3.2
04	9.78973	10	9.89343	16	0.10657	9.89630	6	96	3 4.8
05	9.78983	9	9.89359	16	0.10641	9.89624	6	95	4 6.4
06	9.78992	10	9.89375	15	0.10625	9.89618	6	94	5 8.0
07	9.79002	10	9.89390	16	0.10610	9.89612	6	93	6 9.6
08	9.79012	9	9.89406	16	0.10594	9.89606	6	92	7 11.2
09	9.79021	10	9.89422	15	0.10578	9.89600	6	91	8 12.8
10	9.79031	10	9.89437	16	0.10563	9.89594	6	90	9 14.4
11	9.79041	9	9.89453	15	0.10547	9.89588	6	89	15
12	9.79050	10	9.89468	16	0.10532	9.89582	6	88	1 1.5
13	9.79060	10	9.89484	16	0.10516	9.89576	6	87	2 3.0
14	9.79070	9	9.89500	15	0.10500	9.89570	6	86	3 4.5
15	9.79079	10	9.89515	16	0.10485	9.89564	6	85	4 6.0
16	9.79089	10	9.89531	15	0.10469	9.89558	6	84	5 7.5
17	9.79099	9	9.89546	16	0.10454	9.89552	6	83	6 9.0
18	9.79108	10	9.89562	16	0.10438	9.89546	6	82	7 10.5
19	9.79118	10	9.89578	15	0.10422	9.89540	6	81	8 12.0
20	9.79128	9	9.89593	16	0.10407	9.89534	6	80	9 13.5
21	9.79137	10	9.89609	15	0.10391	9.89528	6	79	10
22	9.79147	9	9.89624	16	0.10376	9.89522	6	78	1 1.0
23	9.79156	10	9.89640	16	0.10360	9.89516	6	77	2 2.0
24	9.79166	10	9.89656	15	0.10344	9.89510	6	76	3 3.0
25	9.79176	9	9.89671	16	0.10329	9.89504	5	75	4 4.0
26	9.79185	10	9.89687	15	0.10313	9.89499	6	74	5 5.0
27	9.79195	9	9.89702	16	0.10298	9.89493	6	73	6 6.0
28	9.79204	10	9.89718	16	0.10282	9.89487	6	72	7 7.0
29	9.79214	10	9.89734	15	0.10266	9.89481	6	71	8 8.0
30	9.79224	9	9.89749	16	0.10251	9.89475	6	70	9 9.0
31	9.79233	10	9.89765	15	0.10235	9.89469	6	69	9
32	9.79243	9	9.89780	16	0.10220	9.89463	6	68	1 0.9
33	9.79252	10	9.89796	15	0.10204	9.89457	6	67	2 1.8
34	9.79262	10	9.89811	16	0.10189	9.89451	6	66	3 2.7
35	9.79272	9	9.89827	16	0.10173	9.89445	6	65	4 3.6
36	9.79281	10	9.89843	15	0.10157	9.89439	6	64	5 4.5
37	9.79291	9	9.89858	16	0.10142	9.89433	6	63	6 5.4
38	9.79300	10	9.89874	15	0.10126	9.89427	6	62	7 6.3
39	9.79310	9	9.89889	16	0.10111	9.89421	6	61	8 7.2
40	9.79319	10	9.89905	15	0.10095	9.89415	6	60	9 8.1
41	9.79329	10	9.89920	16	0.10080	9.89409	6	59	6
42	9.79339	9	9.89936	16	0.10064	9.89403	6	58	1 0.6
43	9.79348	10	9.89952	15	0.10048	9.89397	6	57	2 1.2
44	9.79358	9	9.89967	16	0.10033	9.89391	6	56	3 1.8
45	9.79367	10	9.89983	15	0.10017	9.89385	6	55	4 2.4
46	9.79377	9	9.89998	16	0.10002	9.89379	6	54	5 3.0
47	9.79386	10	9.90014	15	0.09986	9.89373	7	53	6 3.6
48	9.79396	9	9.90029	16	0.09971	9.89366	6	52	7 4.2
49	9.79405	10	9.90045	16	0.09955	9.89360	6	51	8 4.8
50	9.79415		9.90061		0.09939	9.89354		50	9 5.4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					51°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

38°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.79415	9	9.90061	15	0.09939	9.89354	6	50	
51	9.79424	10	9.90076	16	0.09924	9.89348	6	49	16
52	9.79434	10	9.90092	15	0.09908	9.89342	6	48	1 | 1.6
53	9.79444	9	9.90107	16	0.09893	9.89336	6	47	2 | 3.2
									3 | 4.8
54	9.79453	10	9.90123	15	0.09877	9.89330	6	46	4 | 6.4
55	9.79463	9	9.90138	16	0.09862	9.89324	6	45	5 | 8.0
56	9.79472	10	9.90154	15	0.09846	9.89318	6	44	6 | 9.6
									7 | 11.2
57	9.79482	9	9.90169	16	0.09831	9.89312	6	43	8 | 12.8
58	9.79491	10	9.90185	15	0.09815	9.89306	6	42	9 | 14.4
59	9.79501	9	9.90200	16	0.09800	9.89300	6	41	
60	9.79510	10	9.90216	16	0.09784	9.89294	6	40	
									15
61	9.79520	9	9.90232	15	0.09768	9.89288	6	39	1 | 1.5
62	9.79529	10	9.90247	16	0.09753	9.89282	6	38	2 | 3.0
63	9.79539	9	9.90263	15	0.09737	9.89276	6	37	3 | 4.5
									4 | 6.0
64	9.79548	10	9.90278	16	0.09722	9.89270	6	36	5 | 7.5
65	9.79558	9	9.90294	15	0.09706	9.89264	6	35	6 | 9.0
66	9.79567	9	9.90309	16	0.09691	9.89258	6	34	7 | 10.5
									8 | 12.0
67	9.79576	10	9.90325	15	0.09675	9.89252	6	33	9 | 13.5
68	9.79586	9	9.90340	16	0.09660	9.89246	7	32	
69	9.79595	10	9.90356	15	0.09644	9.89239	6	31	
70	9.79605	9	9.90371	16	0.09629	9.89233	6	30	
71	9.79614	10	9.90387	16	0.09613	9.89227	6	29	
72	9.79624	9	9.90403	15	0.09597	9.89221	6	28	10
73	9.79633	10	9.90418	16	0.09582	9.89215	6	27	1 | 1.0
									2 | 2.0
74	9.79643	9	9 90434	15	0.09566	9.89209	6	26	3 | 3.0
75	9.79652	10	9.90449	16	0.09551	9.89203	6	25	4 | 4.0
76	9.79662	9	9.90465	15	0.09535	9.89197	6	24	5 | 5.0
									6 | 6.0
77	9.79671	9	9.90480	16	0.09520	9.89191	6	23	7 | 7.0
78	9.79680	10	9.90496	15	0.09504	9.89185	6	22	8 | 8.0
79	9.79690	9	9.90511	16	0.09489	9.89179	6	21	9 | 9.0
80	9.79699	10	9.90527	15	0.09473	9.89173	7	20	
81	9.79709	9	9.90542	16	0.09458	9.89166	6	19	9
82	9.79718	10	9.90558	15	0.09442	9.89160	6	18	1 | 0.9
83	9.79728	9	9.90573	16	0.09427	9.89154	6	17	2 | 1.8
									3 | 2.7
84	9.79737	9	9.90589	15	0.09411	9.89148	6	16	4 | 3.6
85	9.79746	10	9.90604	16	0.09396	9.89142	6	15	5 | 4.5
86	9.79756	9	9.90620	15	0.09380	9.89136	6	14	6 | 5.4
									7 | 6.3
87	9.79765	10	9.90635	16	0.09365	9.89130	6	13	8 | 7.2
88	9.79775	9	9.90651	15	0.09349	9.89124	6	12	9 | 8.1
89	9.79784	9	9.90666	16	0.09334	9.89118	6	11	
90	9.79793	10	9.90682	15	0.09318	9.89112	7	10	
91	9.79803	9	9.90697	16	0.09303	9.89105	6	09	
92	9.79812	10	9 90713	15	0.09287	9.89099	6	08	7
93	9.79822	9	9.90728	16	0.09272	9.89093	6	07	1 | 0.7
									2 | 1.4
94	9.79831	9	9.90744	15	0.09256	9.89087	6	06	3 | 2.1
95	9.79840	10	9.90759	16	0.09241	9.89081	6	05	4 | 2.8
96	9.79850	9	9.90775	15	0.09225	9.89075	6	04	5 | 3.5
									6 | 4.2
97	9.79859	9	9.90790	16	0.09210	9.89069	6	03	7 | 4.9
98	9.79868	10	9.90806	15	0.09194	9.89063	7	02	8 | 5.6
99	9.79878	9	9.90821	16	0.09179	9.89056	6	01	9 | 6.3
100	9.79887		9.90837		0.09163	9.89050		00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

51°

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					39°				
00	9.79887	10	9.90837	15	0.09163	9.89050	6	100	
01	9.79897	9	9.90852	16	0.09148	9.89044	6	99	16
02	9.79906	9	9.90868	15	0.09132	9.89038	6	98	1 1.6
03	9.79915	10	9.90883	16	0.09117	9.89032	6	97	2 3.2
04	9.79925	9	9.90899	15	0.09101	9.89026	6	96	3 4.8
05	9.79934	9	9.90914	16	0.09086	9.89020	7	95	4 6.4
06	9.79943	10	9.90930	15	0.09070	9.89013	6	94	5 8.0
07	9.79953	9	9.90945	16	0.09055	9.89007	6	93	6 9.6
08	9.79962	9	9.90961	15	0.09039	9.89001	6	92	7 11.2
09	9.79971	10	9.90976	16	0.09024	9.88995	6	91	8 12.8
10	9.79981	9	9.90992	15	0.09008	9.88989	6	90	9 14.4
11	9.79990	9	9.91007	16	0.08993	9.88983	7	89	15
12	9.79999	10	9.91023	15	0.08977	9.88976	6	88	1 1.5
13	9.80009	9	9.91038	16	0.08962	9.88970	6	87	2 3.0
14	9.80018	9	9.91054	15	0.08946	9.88964	6	86	3 4.5
15	9.80027	10	9.91069	16	0.08931	9.88958	6	85	4 6.0
16	9.80037	9	9.91085	15	0.08915	9.88952	6	84	5 7.5
17	9.80046	9	9.91100	16	0.08900	9.88946	7	83	6 9.0
18	9.80055	9	9.91116	15	0.08884	9.88939	6	82	7 10.5
19	9.80064	10	9.91131	16	0.08869	9.88933	6	81	8 12.0
20	9.80074	9	9.91147	15	0.08853	9.88927	6	80	9 13.5
21	9.80083	9	9.91162	16	0.08838	9.88921	6	79	10
22	9.80092	10	9.91178	15	0.08822	9.88915	6	78	1 1.0
23	9.80102	9	9.91193	16	0.08807	9.88909	7	77	2 2.0
24	9.80111	9	9.91209	15	0.08791	9.88902	6	76	3 3.0
25	9.80120	9	9.91224	15	0.08776	9.88896	6	75	4 4.0
26	9.80129	10	9.91239	16	0.08761	9.88890	6	74	5 5.0
27	9.80139	9	9.91255	15	0.08745	9.88884	6	73	6 6.0
28	9.80148	9	9.91270	16	0.08730	9.88878	7	72	7 7.0
29	9.80157	9	9.91286	15	0.08714	9.88871	6	71	8 8.0
30	9.80166	10	9.91301	16	0.08699	9.88865	6	70	9 9.0
31	9.80176	9	9.91317	15	0.08683	9.88859	6	69	9
32	9.80185	9	9.91332	16	0.08668	9.88853	6	68	1 0.9
33	9.80194	10	9.91348	15	0.08652	9.88847	7	67	2 1.8
34	9.80204	9	9.91363	16	0.08637	9.88840	6	66	3 2.7
35	9.80213	9	9.91379	15	0.08621	9.88834	6	65	4 3.6
36	9.80222	9	9.91394	16	0.08606	9.88828	6	64	5 4.5
37	9.80231	9	9.91410	15	0.08590	9.88822	7	63	6 5.4
38	9.80240	10	9.91425	16	0.08575	9.88815	6	62	7 6.3
39	9.80250	9	9.91441	15	0.08559	9.88809	6	61	8 7.2
40	9.80259	9	9.91456	15	0.08544	9.88803	6	60	9 8.1
41	9.80268	9	9.91471	16	0.08529	9.88797	6	59	6
42	9.80277	10	9.91487	15	0.08513	9.88791	7	58	1 0.6
43	9.80287	9	9.91502	16	0.08498	9.88784	6	57	2 1.2
44	9.80296	9	9.91518	15	0.08482	9.88778	6	56	3 1.8
45	9.80305	9	9.91533	16	0.08467	9.88772	6	55	4 2.4
46	9.80314	9	9.91549	15	0.08451	9.88766	7	54	5 3.0
47	9.80323	10	9.91564	16	0.08436	9.88759	6	53	6 3.6
48	9.80333	9	9.91580	15	0.08420	9.88753	6	52	7 4.2
49	9.80342	9	9.91595	15	0.08405	9.88747	6	51	8 4.8
50	9.80351		9.91610		0.08390	9.88741		50	9 5.4
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					50°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

39°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.80351	9	9.91610	16	0.08390	9.88741	7	50	
51	9.80360	9	9.91626	15	0.08374	9.88734	6	49	16
52	9.80369	10	9.91641	16	0.08359	9.88728	6	48	1 1.6
53	9.80379	9	9.91657	15	0.08343	9.88722	6	47	2 3.2
54	9.80388	9	9.91672	16	0.08328	9.88716	7	46	3 4.8
55	9.80397	9	9.91688	15	0.08312	9.88709	6	45	4 6.4
56	9.80406	9	9.91703	16	0.08297	9.88703	6	44	5 8.0
57	9.80415	10	9.91719	15	0.08281	9.88697	6	43	6 9.6
58	9.80425	9	9.91734	15	0.08266	9.88691	7	42	7 11.2
59	9.80434	9	9.91749	16	0.08251	9.88684	6	41	8 12.8
60	9.80443	9	9.91765	15	0.08235	9.88678	6	40	9 14.4
61	9.80452	9	9.91780	16	0.08220	9.88672	7	39	15
62	9.80461	9	9.91796	15	0.08204	9.88665	6	38	1 1.5
63	9.80470	9	9.91811	16	0.08189	9.88659	6	37	2 3.0
64	9.80479	10	9.91827	15	0.08173	9.88653	6	36	3 4.5
65	9.80489	9	9.91842	15	0.08158	9.88647	7	35	4 6.0
66	9.80498	9	9.91857	16	0.08143	9.88640	6	34	5 7.5
67	9.80507	9	9.91873	15	0.08127	9.88634	6	33	6 9.0
68	9.80516	9	9.91888	16	0.08112	9.88628	7	32	7 10.5
69	9.80525	9	9.91904	15	0.08096	9.88621	6	31	8 12.0
70	9.80534	9	9.91919	16	0.08081	9.88615	6	30	9 13.5
71	9.80543	10	9.91935	15	0.08065	9.88609	6	29	10
72	9.80553	9	9.91950	15	0.08050	9.88603	7	28	1 1.0
73	9.80562	9	9.91965	16	0.08035	9.88596	6	27	2 2.0
74	9.80571	9	9.91981	15	0.08019	9.88590	6	26	3 3.0
75	9.80580	9	9.91996	16	0.08004	9.88584	7	25	4 4.0
76	9.80589	9	9.92012	15	0.07988	9.88577	6	24	5 5.0
77	9.80598	9	9.92027	15	0.07973	9.88571	6	23	6 6.0
78	9.80607	9	9.92042	16	0.07958	9.88565	7	22	7 7.0
79	9.80616	9	9.92058	15	0.07942	9.88558	6	21	8 8.0
80	9.80625	10	9.92073	16	0.07927	9.88552	6	20	9 9.0
81	9.80635	9	9.92089	15	0.07911	9.88546	6	19	9
82	9.80644	9	9.92104	16	0.07896	9.88540	7	18	1 0.9
83	9.80653	9	9.92120	15	0.07880	9.88533	6	17	2 1.8
84	9.80662	9	9.92135	15	0.07865	9.88527	6	16	3 2.7
85	9.80671	9	9.92150	16	0.07850	9.88521	7	15	4 3.6
86	9.80680	9	9.92166	15	0.07834	9.88514	6	14	5 4.5
87	9.80689	9	9.92181	16	0.07819	9.88508	6	13	6 5.4
88	9.80698	9	9.92197	15	0.07803	9.88502	7	12	7 6.3
89	9.80707	9	9.92212	15	0.07788	9.88495	6	11	8 7.2
90	9.80716	9	9.92227	16	0.07773	9.88489	6	10	9 8.1
91	9.80725	9	9.92243	15	0.07757	9.88483	7	09	7
92	9.80734	9	9.92258	16	0.07742	9.88476	6	08	1 0.7
93	9.80743	9	9.92274	15	0.07726	9.88470	6	07	2 1.4
94	9.80752	10	9.92289	15	0.07711	9.88464	7	06	3 2.1
95	9.80762	9	9.92304	16	0.07696	9.88457	6	05	4 2.8
96	9.80771	9	9.92320	15	0.07680	9.88451	7	04	5 3.5
97	9.80780	9	9.92335	16	0.07665	9.88444	6	03	6 4.2
98	9.80789	9	9.92351	15	0.07649	9.88438	6	02	7 4.9
99	9.80798	9	9.92366	15	0.07634	9.88432	7	01	8 5.6
100	9.80807		9.92381		0.07619	9.88425		00	9 6.3
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

50°

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					40°				
00	9.80807	9	9.92381	16	0.07619	9.88425	6	100	
01	9.80816	9	9.92397	15	0.07603	9.88419	6	99	16
02	9.80825	9	9.92412	16	0.07588	9.88413	7	98	1 | 1.6
03	9.80834	9	9.92428	15	0.07572	9.88406	6	97	2 | 3.2
04	9.80843	9	9.92443	15	0.07557	9.88400	6	96	3 | 4.8
05	9.80852	9	9.92458	16	0.07542	9.88394	7	95	4 | 6.4
06	9.80861	9	9.92474	15	0.07526	9.88387	6	94	5 | 8.0
07	9.80870	9	9.92489	15	0.07511	9.88381	7	93	6 | 9.6
08	9.80879	9	9.92504	16	0.07496	9.88374	6	92	7 | 11.2
09	9.80888	9	9.92520	15	0.07480	9.88368	6	91	8 | 12.8
10	9.80897	9	9.92535	16	0.07465	9.88362	7	90	9 | 14.4
11	9.80906	9	9.92551	15	0.07449	9.88355	6	89	15
12	9.80915	9	9.92566	15	0.07434	9.88349	6	88	1 | 1.5
13	9.80924	9	9.92581	16	0.07419	9.88343	7	87	2 | 3.0
14	9.80933	9	9.92597	15	0.07403	9.88336	6	86	3 | 4.5
15	9.80942	9	9.92612	16	0.07388	9.88330	7	85	4 | 6.0
16	9.80951	9	9.92628	15	0.07372	9.88323	6	84	5 | 7.5
17	9.80960	9	9.92643	15	0.07357	9.88317	6	83	6 | 9.0
18	9.80969	9	9.92658	16	0.07342	9.88311	7	82	7 | 10.5
19	9.80978	9	9.92674	15	0.07326	9.88304	6	81	8 | 12.0
20	9.80987	9	9.92689	15	0.07311	9.88298	7	80	9 | 13.5
21	9.80996	9	9.92704	16	0.07296	9.88291	6	79	
22	9.81005	9	9.92720	15	0.07280	9.88285	6	78	9
23	9.81014	9	9.92735	16	0.07265	9.88279	7	77	1 | 0.9
24	9.81023	9	9.92751	15	0.07249	9.88272	6	76	2 | 1.8
25	9.81032	9	9.92766	15	0.07234	9.88266	7	75	3 | 2.7
26	9.81041	8	9.92781	16	0.07219	9.88259	6	74	4 | 3.6
27	9.81049	9	9.92797	15	0.07203	9.88253	7	73	5 | 4.5
28	9.81058	9	9.92812	15	0.07188	9.88246	6	72	6 | 5.4
29	9.81067	9	9.92827	16	0.07173	9.88240	6	71	7 | 6.3
30	9.81076	9	9.92843	15	0.07157	9.88234	7	70	8 | 7.2
31	9.81085	9	9.92858	15	0.07142	9.88227	6	69	9 | 8.1
32	9.81094	9	9.92873	16	0.07127	9.88221	7	68	8
33	9.81103	9	9.92889	15	0.07111	9.88214	6	67	1 | 0.8
34	9.81112	9	9.92904	16	0.07096	9.88208	7	66	2 | 1.6
35	9.81121	9	9.92920	15	0.07080	9.88201	6	65	3 | 2.4
36	9.81130	9	9.92935	15	0.07065	9.88195	6	64	4 | 3.2
37	9.81139	9	9.92950	16	0.07050	9.88189	7	63	5 | 4.0
38	9.81148	9	9.92966	15	0.07034	9.88182	6	62	6 | 4.8
39	9.81157	9	9.92981	15	0.07019	9.88176	7	61	7 | 5.6
40	9.81166	8	9.92996	16	0.07004	9.88169	6	60	8 | 6.4
41	9.81174	9	9.93012	15	0.06988	9.88163	7	59	9 | 7.2
42	9.81183	9	9.93027	15	0.06973	9.88156	6	58	7
43	9.81192	9	9.93042	16	0.06958	9.88150	7	57	1 | 0.7
44	9.81201	9	9.93058	15	0.06942	9.88143	6	56	2 | 1.4
45	9.81210	9	9.93073	15	0.06927	9.88137	7	55	3 | 2.1
46	9.81219	9	9.93088	16	0.06912	9.88130	6	54	4 | 2.8
47	9.81228	9	9.93104	15	0.06896	9.88124	7	53	5 | 3.5
48	9.81237	9	9.93119	16	0.06881	9.88117	6	52	6 | 4.2
49	9.81246	8	9.93135	15	0.06865	9.88111	6	51	7 | 4.9
50	9.81254		9.93150		0.06850	9.88105		50	8 | 5.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		9 | 6.3
					49°				Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					40°				
50	9.81254	9	9.93150	15	0.06850	9.88105	7	50	
51	9.81263	9	9.93165	16	0.06835	9.88098	6	49	
52	9.81272	9	9.93181	15	0.06819	9.88092	7	48	16
53	9.81281	9	9.93196	15	0.06804	9.88085	6	47	1 | 1.6
54	9.81290	9	9.93211	16	0.06789	9.88079	7	46	2 | 3.2
55	9.81299	9	9.93227	15	0.06773	9.88072	6	45	3 | 4.8
56	9.81308	8	9.93242	15	0.06758	9.88066	7	44	4 | 6.4
57	9.81316	9	9.93257	16	0.06743	9.88059	6	43	5 | 8.0
58	9.81325	9	9.93273	15	0.06727	9.88053	7	42	6 | 9.6
59	9.81334	9	9.93288	15	0.06712	9.88046	6	41	7 | 11.2
60	9.81343	9	9.93303	16	0.06697	9.88040	7	40	8 | 12.8
61	9.81352	9	9.93319	15	0.06681	9.88033	6	39	9 | 14.4
62	9.81361	9	9.93334	15	0.06666	9.88027	7	38	15
63	9.81370	8	9.93349	16	0.06651	9.88020	6	37	1 | 1.5
64	9.81378	9	9.93365	15	0.06635	9.88014	7	36	2 | 3.0
65	9.81387	9	9.93380	15	0.06620	9.88007	6	35	3 | 4.5
66	9.81396	9	9.93395	16	0.06605	9.88001	7	34	4 | 6.0
67	9.81405	9	9.93411	15	0.06589	9.87994	6	33	5 | 7.5
68	9.81414	8	9.93426	15	0.06574	9.87988	7	32	6 | 9.0
69	9.81422	9	9.93441	16	0.06559	9.87981	6	31	7 | 10.5
70	9.81431	9	9.93457	15	0.06543	9.87975	7	30	8 | 12.0
71	9.81440	9	9.93472	15	0.06528	9.87968	6	29	9 | 13.5
72	9.81449	9	9.93487	16	0.06513	9.87962	7	28	8
73	9.81458	9	9.93503	15	0.06497	9.87955	6	27	1 | 0.8
74	9.81467	8	9.93518	15	0.06482	9.87949	7	26	2 | 1.6
75	9.81475	9	9.93533	16	0.06467	9.87942	7	25	3 | 2.4
76	9.81484	9	9.93549	15	0.06451	9.87935	6	24	4 | 3.2
77	9.81493	9	9.93564	15	0.06436	9.87929	7	23	5 | 4.0
78	9.81502	8	9.93579	16	0.06421	9.87922	6	22	6 | 4.8
79	9.81510	9	9.93595	15	0.06405	9.87916	7	21	7 | 5.6
80	9.81519	9	9.93610	15	0.06390	9.87909	6	20	8 | 6.4
81	9.81528	9	9.93625	16	0.06375	9.87903	7	19	9 | 7.2
82	9.81537	9	9.93641	15	0.06359	9.87896	6	18	7
83	9.81546	8	9.93656	15	0.06344	9.87890	7	17	1 | 0.7
84	9.81554	9	9.93671	16	0.06329	9.87883	6	16	2 | 1.4
85	9.81563	9	9.93687	15	0.06313	9.87877	7	15	3 | 2.1
86	9.81572	9	9.93702	15	0.06298	9.87870	7	14	4 | 2.8
87	9.81581	8	9.93717	16	0.06283	9.87863	6	13	5 | 3.5
88	9.81589	9	9.93733	15	0.06267	9.87857	7	12	6 | 4.2
89	9.81598	9	9.93748	15	0.06252	9.87850	6	11	7 | 4.9
90	9.81607	9	9.93763	15	0.06237	9.87844	7	10	8 | 5.6
91	9.81616	8	9.93778	16	0.06222	9.87837	6	09	9 | 6.3
92	9.81624	9	9.93794	15	0.06206	9.87831	7	08	6
93	9.81633	9	9.93809	15	0 06191	9.87824	7	07	1 | 0.6
94	9.81642	9	9.93824	16	0.06176	9.87817	6	06	2 | 1.2
95	9.81651	8	9.93840	15	0.06160	9.87811	7	05	3 | 1.8
96	9.81659	9	9.93855	15	0.06145	9.87804	6	04	4 | 2.4
97	9.81668	9	9.93870	16	0.06130	9.87798	7	03	5 | 3.0
98	9.81677	9	9.93886	15	0.06114	9.87791	6	02	6 | 3.6
99	9.81686	8	9.93901	15	0 06099	9.87785	7	01	7 | 4.2
100	9.81694		9.93916		0.06084	9.87778		00	8 | 4.8
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		9 | 5.4
					49°				Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					41°				
00	9. 81694	9	9. 93916	16	0. 06084	9. 87778	7	100	
01	9. 81703	9	9. 93932	15	0. 06068	9. 87771	6	99	
02	9. 81712	8	9. 93947	15	0. 06053	9. 87765	7	98	16
03	9. 81720	9	9. 93962	16	0. 06038	9. 87758	6	97	1 1.6
04	9. 81729	9	9. 93978	15	0. 06022	9. 87752	7	96	2 3.2
05	9. 81738	9	9. 93993	15	0. 06007	9. 87745	7	95	3 4.8
06	9. 81747	8	9. 94008	15	0. 05992	9. 87738	6	94	4 6.4
07	9. 81755	9	9. 94023	16	0. 05977	9. 87732	7	93	5 8.0
08	9. 81764	9	9. 94039	15	0. 05961	9. 87725	6	92	6 9.6
09	9. 81773	8	9. 94054	15	0. 05946	9. 87719	7	91	7 11.2
10	9. 81781	9	9. 94069	16	0. 05931	9. 87712	7	90	8 12.8
11	9. 81790	9	9. 94085	15	0. 05915	9. 87705	6	89	9 14.4
12	9. 81799	8	9. 94100	15	0. 05900	9. 87699	7	88	15
13	9. 81807	9	9. 94115	16	0. 05885	9. 87692	6	87	1 1.5
14	9. 81816	9	9. 94131	15	0. 05869	9. 87686	7	86	2 3.0
15	9. 81825	8	9. 94146	15	0. 05854	9. 87679	7	85	3 4.5
16	9. 81833	9	9. 94161	15	0. 05839	9. 87672	6	84	4 6.0
17	9. 81842	9	9. 94176	16	0. 05824	9. 87666	7	83	5 7.5
18	9. 81851	8	9. 94192	15	0. 05808	9. 87659	7	82	6 9.0
19	9. 81859	9	9. 94207	15	0. 05793	9. 87652	6	81	7 10.5
20	9. 81868	9	9. 94222	16	0. 05778	9. 87646	7	80	8 12.0
21	9. 81877	8	9. 94238	15	0. 05762	9. 87639	7	79	9 13.5
22	9. 81885	9	9. 94253	15	0. 05747	9. 87632	6	78	9
23	9. 81894	9	9. 94268	16	0. 05732	9. 87626	7	77	1 0.9
24	9. 81903	8	9. 94284	15	0. 05716	9. 87619	6	76	2 1.8
25	9. 81911	9	9. 94299	15	0. 05701	9. 87613	7	75	3 2.7
26	9. 81920	9	9. 94314	15	0. 05686	9. 87606	7	74	4 3.6
27	9. 81929	8	9. 94329	16	0. 05671	9. 87599	6	73	5 4.5
28	9. 81937	9	9. 94345	15	0. 05655	9. 87593	7	72	6 5.4
29	9. 81946	9	9. 94360	15	0. 05640	9. 87586	7	71	7 6.3
30	9. 81955	8	9. 94375	16	0. 05625	9. 87579	6	70	8 7.2
31	9. 81963	9	9. 94391	15	0. 05609	9. 87573	7	69	9 8.1
32	9. 81972	8	9. 94406	15	0. 05594	9. 87566	7	68	8
33	9. 81980	9	9. 94421	15	0. 05579	9. 87559	6	67	1 0.8
34	9. 81989	9	9. 94436	16	0. 05564	9. 87553	7	66	2 1.6
35	9. 81998	8	9. 94452	15	0. 05548	9. 87546	7	65	3 2.4
36	9. 82006	9	9. 94467	15	0. 05533	9. 87539	6	64	4 3.2
37	9. 82015	8	9. 94482	16	0. 05518	9. 87533	7	63	5 4.0
38	9. 82023	9	9. 94498	15	0. 05502	9. 87526	7	62	6 4.8
39	9. 82032	9	9. 94513	15	0. 05487	9. 87519	6	61	7 5.6
40	9. 82041	8	9. 94528	15	0. 05472	9. 87513	7	60	8 6.4
41	9. 82049	9	9. 94543	16	0. 05457	9. 87506	7	59	9 7.2
42	9. 82058	8	9. 94559	15	0. 05441	9. 87499	7	58	7
43	9. 82066	9	9. 94574	15	0. 05426	9. 87492	6	57	1 0.7
44	9. 82075	9	9. 94589	15	0. 05411	9. 87486	7	56	2 1.4
45	9. 82084	8	9. 94604	16	0. 05396	9. 87479	7	55	3 2.1
46	9. 82092	9	9. 94620	15	0. 05380	9. 87472	6	54	4 2.8
47	9. 82101	8	9. 94635	15	0. 05365	9. 87466	7	53	5 3.5
48	9. 82109	9	9. 94650	16	0. 05350	9. 87459	7	52	6 4.2
49	9. 82118	8	9. 94666	15	0. 05334	9. 87452	6	51	7 4.9
50	9. 82126		9. 94681		0. 05319	9. 87446		50	8 5.6
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		9 6.3
					48°				Prop. Pts.

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TABLE LII.—*Common logarithms of circular functions*—Continued

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
					41°				
50	9. 82126		9. 94681	15	0. 05319	9. 87446	7	50	
51	9. 82135	9	9. 94696	15	0. 05304	9. 87439	7	49	16
52	9. 82144	9	9. 94711	16	0. 05289	9. 87432	7	48	
53	9. 82152	8	9. 94727	15	0. 05273	9. 87425	6	47	1 | 1. 6
		9							2 | 3. 2
54	9. 82161	8	9. 94742	15	0. 05258	9. 87419	7	46	3 | 4. 8
55	9. 82169	9	9. 94757	15	0. 05243	9. 87412	7	45	4 | 6. 4
56	9. 82178	8	9. 94772	16	0. 05228	9. 87405	6	44	5 | 8. 0
									6 | 9. 6
57	9. 82186	9	9. 94788	15	0. 05212	9. 87399	7	43	7 | 11. 2
58	9. 82195	8	9. 94803	15	0. 05197	9. 87392	7	42	8 | 12. 8
59	9. 82203	9	9. 94818	16	0. 05182	9. 87385	7	41	9 | 14. 4
60	9. 82212	9	9. 94834	15	0. 05166	9. 87378	6	40	
									15
61	9. 82221	8	9. 94849	15	0. 05151	9. 87372	7	39	1 | 1. 5
62	9. 82229	9	9. 94864	15	0. 05136	9. 87365	7	38	2 | 3. 0
63	9. 82238	8	9. 94879	16	0. 05121	9. 87358	7	37	3 | 4. 5
									4 | 6. 0
64	9. 82246	9	9. 94895	15	0. 05105	9. 87351	6	36	5 | 7. 5
65	9. 82255	8	9. 94910	15	0. 05090	9. 87345	7	35	6 | 9. 0
66	9. 82263	9	9. 94925	15	0. 05075	9. 87338	7	34	7 | 10. 5
									8 | 12. 0
67	9. 82272	8	9. 94940	16	0. 05060	9. 87331	6	33	9 | 13. 5
68	9. 82280	9	9. 94956	15	0. 05044	9. 87325	7	32	
69	9. 82289	8	9. 94971	15	0. 05029	9. 87318	7	31	
70	9. 82297	9	9. 94986	15	0. 05014	9. 87311	7	30	
									8
71	9. 82306	8	9. 95001	16	0. 04999	9. 87304	6	29	
72	9. 82314	9	9. 95017	15	0. 04983	9. 87298	7	28	1 | 0. 8
73	9. 82323	8	9. 95032	15	0. 04968	9. 87291	7	27	2 | 1. 6
									3 | 2. 4
74	9. 82331	9	9. 95047	15	0. 04953	9. 87284	7	26	4 | 3. 2
75	9. 82340	8	9. 95062	16	0. 04938	9. 87277	7	25	5 | 4. 0
76	9. 82348	9	9. 95078	15	0. 04922	9. 87270	6	24	6 | 4. 8
									7 | 5. 6
77	9. 82357	8	9. 95093	15	0. 04907	9. 87264	7	23	8 | 6. 4
78	9. 82365	9	9. 95108	16	0. 04892	9. 87257	7	22	9 | 7. 2
79	9. 82374	8	9. 95124	15	0. 04876	9. 87250	7	21	
80	9. 82382	9	9. 95139	15	0. 04861	9. 77243	6	20	7
81	9. 82391	8	9. 95154	15	0. 04846	9. 87237	7	19	1 | 0. 7
82	9. 82399	9	9. 95169	16	0. 04831	9. 87230	7	18	2 | 1. 4
83	9. 82408	8	9. 95185	15	0. 04815	9. 87223	7	17	3 | 2. 1
									4 | 2. 8
84	9. 82416	8	9. 95200	15	0. 04800	9. 87216	7	16	5 | 3. 5
85	9. 82424	9	9. 95215	15	0. 04785	9. 87209	6	15	6 | 4. 2
86	9. 82433	8	9. 95230	16	0. 04770	9. 87203	7	14	7 | 4. 9
									8 | 5. 6
87	9. 82441	9	9. 95246	15	0. 04754	9. 87196	7	13	9 | 6. 3
88	9. 82450	8	9. 95261	15	0. 04739	9. 87189	7	12	
89	9. 82458	9	9. 95276	15	0. 04724	9. 87182	7	11	
90	9. 82567	8	9. 95391	16	0. 04709	9. 87175	6	10	
									6
91	9. 82475	9	9. 95307	15	0. 04693	9. 87169	7	09	
92	9. 82484	8	9. 95322	15	0. 04678	9. 87162	7	08	
93	9. 82492	9	9. 95337	15	0. 04663	9. 87155	7	07	1 | 0. 6
									2 | 1. 2
94	9. 82501	8	9. 95352	16	0. 04648	9. 87148	7	06	3 | 1. 8
95	9. 82509	8	9. 95368	15	0. 04632	9. 87141	6	05	4 | 2. 4
96	9. 82517	9	9. 95383	15	0. 04617	9. 87135	7	04	5 | 3. 0
									6 | 3. 6
97	9. 82526	8	9. 95398	15	0. 04602	9. 87128	7	03	7 | 4. 2
98	9. 82534	9	9. 95413	16	0. 04587	9. 87121	7	02	8 | 4. 8
99	9. 82543	8	9. 95429	15	0. 04571	9. 87114	7	01	9 | 5. 4
100	9. 82551		9. 95444		0. 04556	9. 87107		00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
					48°				

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TABLE LII.—*Common logarithms of circular functions*—Continued

42°

	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.82551	9	9.95444	15	0.04556	9.87107	6	100	
01	9.82560	8	9.95459	15	0.04541	9.87101	7	99	16
02	9.82568	8	9.95474	15	0.04526	9.87094	7	98	1 | 1.6
03	9.82576	9	9.95489	16	0.04511	9.87087	7	97	2 | 3.2
04	9.82585	8	9.95505	15	0.04495	9.87080	7	96	3 | 4.8
05	9.82593	9	9.95520	15	0.04480	9.87073	7	95	4 | 6.4
06	9.82602	8	9.95535	15	0.04465	9.87066	6	94	5 | 8.0
07	9.82610	8	9.95550	16	0.04450	9.87060	7	93	6 | 9.6
08	9.82618	9	9.95566	15	0.04434	9.87053	7	92	7 | 11.2
09	9.82627	8	9.95581	15	0.04419	9.87046	7	91	8 | 12.8
10	9.82635	9	9.95596	15	0.04404	9.87039	7	90	9 | 14.4
11	9.82644	8	9.95611	16	0.04389	9.87032	7	89	15
12	9.82652	8	9.95627	15	0.04373	9.87025	7	88	1 | 1.5
13	9.82660	9	9.95642	15	0.04358	9.87018	6	87	2 | 3.0
14	9.82669	8	9.95657	15	0.04343	9.87012	7	86	3 | 4.5
15	9.82677	8	9.95672	16	0.04328	9.87005	7	85	4 | 6.0
16	9.82685	9	9.95688	15	0.04312	9.86998	7	84	5 | 7.5
17	9.82694	8	9.95703	15	0.04297	9.86991	7	83	6 | 9.0
18	9.82702	9	9.95718	15	0.04282	9.86984	7	82	7 | 10.5
19	9.82711	8	9.95733	15	0.04267	9.86977	7	81	8 | 12.0
20	9.82719	8	9.95748	16	0.04252	9.86970	7	80	9 | 13.5
21	9.82727	9	9.95764	15	0.04236	9.86963	6	79	9
22	9.82736	8	9.95779	15	0.04221	9.86957	7	78	1 | 0.9
23	9.82744	8	9.95794	15	0.04206	9.86950	7	77	2 | 1.8
24	9.82752	9	9.95809	16	0.04191	9.86943	7	76	3 | 2.7
25	9.82761	8	9.95825	15	0.04175	9.86936	7	75	4 | 3.6
26	9.82769	8	9.95840	15	0.04160	9.86929	7	74	5 | 4.5
27	9.82777	9	9.95855	15	0.04145	9.86922	7	73	6 | 5.4
28	9.82786	8	9.95870	16	0.04130	9.86915	7	72	7 | 6.3
29	9.82794	8	9.95886	15	0.04114	9.86908	6	71	8 | 7.2
30	9.82802	9	9.95901	15	0.04099	9.86902	7	70	9 | 8.1
31	9.82811	8	9.95916	15	0.04084	9.86895	7	69	8
32	9.82819	8	9.95931	15	0.04069	9.86888	7	68	1 | 0.8
33	9.82827	9	9.95946	16	0.04054	9.86881	7	67	2 | 1.6
34	9.82836	8	9.95962	15	0.04038	9.86874	7	66	3 | 2.4
35	9.82844	8	9.95977	15	0.04023	9.86867	7	65	4 | 3.2
36	9.82852	9	9.95992	15	0.04008	9.86860	7	64	5 | 4.0
37	9.82861	8	9.96007	16	0.03993	9.86853	7	63	6 | 4.8
38	9.82869	8	9.96023	15	0.03977	9.86846	7	62	7 | 5.6
39	9.82877	8	9.96038	15	0.03962	9.86839	7	61	8 | 6.4
40	9.82885	9	9.96053	15	0.03947	9.86832	6	60	9 | 7.2
41	9.82894	8	9.96068	15	0.03932	9.86826	7	59	7
42	9.82902	8	9.96083	16	0.03917	9.86819	7	58	1 | 0.7
43	9.82910	9	9.96099	15	0.03901	9.86812	7	57	2 | 1.4
44	9.82919	8	9.96114	15	0.03886	9.86805	7	56	3 | 2.1
45	9.82927	8	9.96129	15	0.03871	9.86798	7	55	4 | 2.8
46	9.82935	9	9.96144	16	0.03856	9.86791	7	54	5 | 3.5
47	9.82944	8	9.96160	15	0.03840	9.86784	7	53	6 | 4.2
48	9.82952	8	9.96175	15	0.03825	9.86777	7	52	7 | 4.9
49	9.82960	8	9.96190	15	0.03810	9.86770	7	51	8 | 5.6
50	9.82968		9.96205		0.03795	9.86763		50	9 | 6.3
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.

47°

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TABLE LII.—*Common logarithms of circular functions*—Continued

42°									
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.82968	9	9.96205	15	0.03795	9.86763	7	50	
51	9.82977	8	9.96220	16	0.03780	9.86756	7	49	16
52	9.82985	8	9.96236	15	0.03764	9.86749	7	48	1 1.6
53	9.82993	8	9.96251	15	0.03749	9.86742	7	47	2 3.2
54	9.83001	9	9.96266	15	0.03734	9.86735	7	46	3 4.8
55	9.83010	8	9.96281	16	0.03719	9.86728	7	45	4 6.4
56	9.83018	8	9.96297	15	0.03703	9.86721	7	44	5 8.0
57	9.83026	8	9.96312	15	0.03688	9.86714	7	43	6 9.6
58	9.83034	9	9.96327	15	0.03673	9.86707	7	42	7 11.2
59	9.83043	8	9.96342	15	0.03658	9.86700	6	41	8 12.8
60	9.83051	8	9.96357	16	0.03643	9.86694	7	40	9 14.4
61	9.83059	8	9.96373	15	0.03627	9.86687	7	39	15
62	9.83067	9	9.96388	15	0.03612	9.86680	7	38	1 1.5
63	9.83076	8	9.96403	15	0.03597	9.86673	7	37	2 3.0
64	9.83084	8	9.96418	15	0.03582	9.86666	7	36	3 4.5
65	9.83092	8	9.96433	16	0.03567	9.86659	7	35	4 6.0
66	9.83100	9	9.96449	15	0.03551	9.86652	7	34	5 7.5
67	9.83109	8	9.96464	15	0.03536	9.86645	7	33	6 9.0
68	9.83117	8	9.96479	15	0.03521	9.86638	7	32	7 10.5
69	9.83125	8	9.96494	16	0.03506	9.86631	7	31	8 12.0
70	9.83133	8	9.96510	15	0.03490	9.86624	7	30	9 13.5
71	9.83141	9	9.96525	15	0.03475	9.86617	7	29	9
72	9.83150	8	9.96540	15	0.03460	9.86610	7	28	1 0.9
73	9.83158	8	9.96655	15	0.03445	9.86603	7	27	2 1.8
74	9.83166	8	9.96570	16	0.03430	9.86596	7	26	3 2.7
75	9.83174	8	9.96586	15	0.03414	9.86589	7	25	4 3.6
76	9.83182	9	9.96601	15	0.03399	9.86582	7	24	5 4.5
77	9.83191	8	9.96616	15	0.03384	9.86575	7	23	6 5.4
78	9.83199	8	9.96631	15	0.03369	9.86568	7	22	7 6.3
79	9.83207	8	9.96646	16	0.03354	9.86561	7	21	8 7.2
80	9.83215	8	9.96662	15	0.03338	9.86554	7	20	9 8.1
81	9.83223	9	9.96677	15	0.03323	9.86547	7	19	8
82	9.83232	8	9.96692	15	0.03308	9.86540	7	18	1 0.8
83	9.83240	8	9.96707	15	0.03293	9.86533	7	17	2 1.6
84	9.83248	8	9.96722	16	0.03278	9.86526	8	16	3 2.4
85	9.83256	8	9.96738	15	0.03262	9.86518	7	15	4 3.2
86	9.83264	8	9.96753	15	0.03247	9.86511	7	14	5 4.0
87	9.83272	9	9.96768	15	0.03232	9.86504	7	13	6 4.8
88	9.83281	8	9.96783	15	0.03217	9.86497	7	12	7 5.6
89	9.83289	8	9.96798	16	0.03202	9.86490	7	11	8 6.4
90	9.83297	8	9.96814	15	0.03186	9.86483	7	10	9 7.2
91	9.83305	8	9.96829	15	0.03171	9.86476	7	09	7
92	9.83313	8	9.96844	15	0.03156	9.86469	7	08	1 0.7
93	9.83321	9	9.96859	15	0.03141	9.86462	7	07	2 1.4
94	9.83330	8	9.96874	16	0.03126	9.86455	7	06	3 2.1
95	9.83338	8	9.96890	15	0.03110	9.86448	7	05	4 2.8
96	9.83346	8	9.96905	15	0.03095	9.86441	7	04	5 3.5
97	9.83354	8	9.96920	15	0.03080	9.86434	7	03	6 4.2
98	9.83362	8	9.96935	15	0.03065	9.86427	7	02	7 4.9
99	9.83370	8	9.96950	16	0.03050	9.86420	7	01	8 5.6
100	9.83378		9.96966		0.03034	9.86413		00	9 6.3
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
47°									

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TABLE LII.—*Common logarithms of circular functions*—Continued

43°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.	
00	9.83378	8	9.96966	15	0.03034	9.86413	7	100
01	9.83386	9	9.96981	15	0.03019	9.86406	7	99
02	9.83395	8	9.96996	15	0.03004	9.86399	7	98
03	9.83403	8	9.97011	15	0.02989	9.86392	8	97
04	9.83411	8	9.97026	16	0.02974	9.86384	7	96
05	9.83419	8	9.97042	15	0.02958	9.86377	7	95
06	9.83427	8	9.97057	15	0.02943	9.86370	7	94
07	9.83435	8	9.97072	15	0.02928	9.86363	7	93
08	9.83443	8	9.97087	15	0.02913	9.86356	7	92
09	9.83451	8	9.97102	16	0.02898	9.86349	7	91
10	9.83459	9	9.97118	15	0.02882	9.86342	7	90
11	9.83468	8	9.97133	15	0.02867	9.86335	7	89
12	9.83476	8	9.97148	15	0.02852	9.86328	7	88
13	9.83484	8	9.97163	15	0.02837	9.86321	7	87
14	9.83492	8	9.97178	15	0.02822	9.86314	8	86
15	9.83500	8	9.97193	16	0.02807	9.86306	7	85
16	9.83508	8	9.97209	15	0.02791	9.86299	7	84
17	9.83516	8	9.97224	15	0.02776	9.86292	7	83
18	9.83524	8	9.97239	15	0.02761	9.86285	7	82
19	9.83532	8	9.97254	15	0.02746	9.86278	7	81
20	9.83540	8	9.97269	16	0.02731	9.86271	7	80
21	9.83548	8	9.97285	15	0.02715	9.86264	7	79
22	9.83556	9	9.97300	15	0.02700	9.86257	7	78
23	9.83565	8	9.97315	15	0.02685	9.86250	8	77
24	9.83573	8	9.97330	15	0.02670	9.86242	7	76
25	9.83581	8	9.97345	16	0.02655	9.86235	7	75
26	9.83589	8	9.97361	15	0.02639	9.86228	7	74
27	9.83597	8	9.97376	15	0.02624	9.86221	7	73
28	9.83605	8	9.97391	15	0.02609	9.86214	7	72
29	9.83613	8	9.97406	15	0.02594	9.86207	7	71
30	9.83621	8	9.97421	16	0.02579	9.86200	8	70
31	9.83629	8	9.97437	15	0.02563	9.86192	7	69
32	9.83637	8	9.97452	15	0.02548	9.86185	7	68
33	9.83645	8	9.97467	15	0.02533	9.86178	7	67
34	9.83653	8	9.97482	15	0.02518	9.86171	7	66
35	9.83661	8	9.97497	15	0.02503	9.86164	7	65
36	9.83669	8	9.97512	16	0.02488	9.86157	7	64
37	9.83677	8	9.97528	15	0.02472	9.86150	8	63
38	9.83685	8	9.97543	15	0.02457	9.86142	7	62
39	9.83693	8	9.97558	15	0.02442	9.86135	7	61
40	9.83701	8	9.97573	15	0.02427	9.86128	7	60
41	9.83709	8	9.97588	16	0.02412	9.86121	7	59
42	9.83717	8	9.97604	15	0.02396	9.86114	7	58
43	9.83725	8	9.97619	15	0.02381	9.86107	8	57
44	9.83733	8	9.97634	15	0.02366	9.86099	7	56
45	9.83741	8	9.97649	15	0.02351	9.86092	7	55
46	9.83749	8	9.97664	15	0.02336	9.86085	7	54
47	9.83757	8	9.97679	16	0.02321	9.86078	7	53
48	9.83765	8	9.97695	15	0.02305	9.86071	8	52
49	9.83773	8	9.97710	15	0.02290	9.86063	7	51
50	9.83781		9.97725		0.02275	9.86056		50
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.	
46°								

Prop. Pts.	
16	
1	1.6
2	3.2
3	4.8
4	6.4
5	8.0
6	9.6
7	11.2
8	12.8
9	14.4
15	
1	1.5
2	3.0
3	4.5
4	6.0
5	7.5
6	9.0
7	10.5
8	12.0
9	13.5
9	
1	0.9
2	1.8
3	2.7
4	3.6
5	4.5
6	5.4
7	6.3
8	7.2
9	8.1
8	
1	0.8
2	1.6
3	2.4
4	3.2
5	4.0
6	4.8
7	5.6
8	6.4
9	7.2
7	
1	0.7
2	1.4
3	2.1
4	2.8
5	3.5
6	4.2
7	4.9
8	5.6
9	6.3

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TABLE LII.—*Common logarithms of circular functions*—Continued

	43°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9.83781	8	9.97725	15	0.02275	9.86056	7	50	
51	9.83789	8	9.97740	15	0.02260	9.86049	7	49	
52	9.83797	8	9.97755	16	0.02245	9.86042	7	48	
53	9.83805	8	9.97771	15	0.02229	9.86035	8	47	16
54	9.83813	8	9.97786	15	0.02214	9.86027	7	46	1 | 1.6
55	9.83821	8	9.97801	15	0.02199	9.86020	7	45	2 | 3.2
56	9.83829	8	9.97816	15	0.02184	9.86013	7	44	3 | 4.8
57	9.83837	8	9.97831	15	0.02169	9.86006	7	43	4 | 6.4
58	9.83845	8	9.97846	16	0.02154	9.85999	8	42	5 | 8.0
59	9.83853	8	9.97862	15	0 02138	9.85991	7	41	6 | 9.6
60	9.83861	8	9.97877	15	0.02123	9.85984	7	40	7 | 11.2
61	9.83869	8	9.97892	15	0.02108	9.85977	7	39	8 | 12.8
62	9.83877	8	9.97907	15	0.02093	9.85970	8	38	9 | 14.4
63	9.83885	8	9.97922	16	0.02078	9.85962	7	37	
64	9.83893	8	9.97938	15	0.02062	9.85955	7	36	
65	9.83901	8	9.97953	15	0.02047	9.85948	7	35	15
66	9.83909	8	9.97968	15	0.02032	9.85941	7	34	1 | 1.5
67	9.83917	8	9.97983	15	0.02017	9.85934	8	33	2 | 3.0
68	9.83925	7	9.97998	15	0.02002	9.85926	7	32	3 | 4.5
69	9.83932	8	9.98013	16	0.01987	9.85919	7	31	4 | 6.0
70	9.83940	8	9.98029	15	0.01971	9.85912	7	30	5 | 7.5
71	9.83948	8	9.98044	15	0.01956	9.85905	8	29	6 | 9.0
72	9.83956	8	9.98059	15	0.01941	9.85897	7	28	7 | 10.5
73	9.83964	8	9.98074	15	0.01926	9.85890	7	27	8 | 12.0
74	9.83972	8	9.98089	15	0.01911	9.85883	7	26	9 | 13.5
75	9.83980	8	9.98104	16	0.01896	9.85876	8	25	
76	9.83988	8	9.98120	15	0.01880	9.85868	7	24	
77	9.83996	8	9.98135	15	0.01865	9.85861	7	23	
78	9.84004	8	9.98150	15	0.01850	9.85854	7	22	
79	9.84012	8	9.98165	15	0.01835	9.85847	8	21	8
80	9.84020	7	9.98180	15	0.01820	9.85839	7	20	1 | 0.8
81	9.84027	8	9.98195	16	0.01805	9.85832	7	19	2 | 1.6
82	9.84035	8	9.98211	15	0.01789	9.85825	8	18	3 | 2.4
83	9.84043	8	9.98226	15	0.01774	9.85817	7	17	4 | 3.2
84	9.84051	8	9.98241	15	0.01759	9.85810	7	16	5 | 4.0
85	9.84059	8	9.98256	15	0.01744	9.85803	7	15	6 | 4.8
86	9.84067	8	9.98271	16	0.01729	9.85796	8	14	7 | 5.6
87	9.84075	8	9.98287	15	0.01713	9.85788	7	13	8 | 6.4
88	9.84083	8	9.98302	15	0.01698	9.85781	7	12	9 | 7.2
89	9.84091	7	9.98317	15	0.01683	9.85774	8	11	
90	9.84098	8	9.98332	15	0.01668	9.85766	7	10	
91	9.84106	8	9.98347	15	0.01653	9.85759	7	09	7
92	9.84114	8	9.98362	16	0.01638	9.85752	7	08	1 | 0.7
93	9.84122	8	9.98378	15	0.01622	9.85745	8	07	2 | 1.4
94	9.84130	8	9.98393	15	0.01607	9.85737	7	06	3 | 2.1
95	9.84138	8	9.98408	15	0.01592	9.85730	7	05	4 | 2.8
96	9.84146	8	9.98423	15	0.01577	9.85723	8	04	5 | 3.5
97	9.84154	7	9.98438	15	0.01562	9.85715	7	03	6 | 4.2
98	9.84161	8	9.98453	16	0.01547	9.85708	7	02	7 | 4.9
99	9.84169	8	9.98469	15	0.01531	9.85701	8	01	8 | 5.6
100	9.84177		9.98484		0.01516	9.85693		00	9 | 6.3
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
	46°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

	44°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
00	9.84177	8	9.98484	15	0.01516	9.85693	7	100	
01	9.84185	8	9.98499	15	0.01501	9.85686	7	99	
02	9.84193	8	9.98514	15	0.01486	9.85679	8	98	
03	9.84201	8	9.98529	15	0.01471	9.85671	7	97	16
04	9.84209	7	9.98544	16	0.01456	9.85664	7	96	1 1.6
05	9.84216	8	9.98560	15	0.01440	9.85657	8	95	2 3.2
06	9.84224	8	9.98575	15	0.01425	9.85649	7	94	3 4.8
07	9.84232	8	9.98590	15	0.01410	9.85642	7	93	4 6.4
08	9.84240	8	9.98605	15	0.01395	9.85635	8	92	5 8.0
09	9.84248	7	9.98620	15	0.01380	9.85627	7	91	6 9.6
10	9.84255	8	9.98635	16	0.01365	9.85620	7	90	7 11.2
11	9.84263	8	9.98651	15	0.01349	9.85613	8	89	8 12.8
12	9.84271	8	9.98666	15	0.01334	9.85605	7	88	9 14.4
13	9.84279	8	9.98681	15	0.01319	9.85598	7	87	
14	9.84287	8	9.98696	15	0.01304	9.85591	8	86	15
15	9.84295	7	9.98711	15	0.01289	9.85583	7	85	1 1.5
16	9.84302	8	9.98726	16	0.01274	9.85576	7	84	2 3.0
17	9.84310	8	9.98742	15	0.01258	9.85569	8	83	3 4.5
18	9.84318	8	9.98757	15	0.01243	9.85561	7	82	4 6.0
19	9.84326	8	9.98772	15	0.01228	9.85554	7	81	5 7.5
20	9.84334	7	9.98787	15	0.01213	9.85547	8	80	6 9.0
21	9.84341	8	9.98802	15	0.01198	9.85539	7	79	7 10.5
22	9.84349	8	9.98817	16	0.01183	9.85532	8	78	8 12.0
23	9.84357	8	9.98833	15	0.01167	9.85524	7	77	9 13.5
24	9.84365	8	9.98848	15	0.01152	9.85517	7	76	
25	9.84373	7	9.98863	15	0.01137	9.85510	8	75	
26	9.84380	8	9.98878	15	0.01122	9.85502	7	74	
27	9.84388	8	9.98893	15	0.01107	9.85495	8	73	
28	9.84396	8	9.98908	16	0.01092	9.85487	7	72	
29	9.84404	7	9.98924	15	0.01076	9.85480	7	71	8
30	9.84411	8	9.98939	15	0.01061	9.85473	8	70	1 0.8
31	9.84419	8	9.98954	15	0.01046	9.85465	7	69	2 1.6
32	9.84427	8	9.98969	15	0.01031	9.85458	8	68	3 2.4
33	9.84435	7	9.98984	15	0.01016	9.85450	7	67	4 3.2
34	9.84442	8	9.98999	16	0.01001	9.85443	7	66	5 4.0
35	9.84450	8	9.99015	15	0.00985	9.85436	8	65	6 4.8
36	9.84458	8	9.99030	15	0.00970	9.85428	7	64	7 5.6
37	9.84466	7	9.99045	15	0.00955	9.85421	8	63	8 6.4
38	9.84473	8	9.99060	15	0.00940	9.85413	7	62	9 7.2
39	9.84481	8	9.99075	15	0.00925	9.85406	7	61	
40	9.84489	8	9.99090	16	0.00910	9.85399	8	60	7
41	9.84497	7	9.99106	15	0.00894	9.85391	7	59	1 0.7
42	9.84504	8	9.99121	15	0.00879	9.85384	8	58	2 1.4
43	9.84512	8	9.99136	15	0.00864	9.85376	7	57	3 2.1
44	9.84520	8	9.99151	15	0.00849	9.85369	8	56	4 2.8
45	9.84528	7	9.99166	15	0.00834	9.85361	7	55	5 3.5
46	9.84535	8	9.99181	15	0.00819	9.85354	7	54	6 4.2
47	9.84543	8	9.99196	16	0.00804	9.85347	8	53	7 4.9
48	9.84551	7	9.99212	15	0.00788	9.85339	7	52	8 5.6
49	9.84558	8	9.99227	15	0.00773	9.85332	8	51	9 6.3
50	9.84566		9.99242		0.00758	9.85324		50	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
	45°								

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TABLE LII.—*Common logarithms of circular functions*—Continued

	44°								
	Sin.	d.	Tan.	d. c.	Cot.	Cos.	d.		Prop. Pts.
50	9. 84566	8	9. 99242	15	0. 00758	9. 85324	7	50	
51	9. 84574	8	9. 99257	15	0. 00743	9. 85317	8	49	
52	9. 84582	7	9. 99272	15	0. 00728	9. 85309	7	48	
53	9. 84589	8	9. 99287	16	0. 00713	9. 85302	8	47	16
54	9. 84597	8	9. 99303	15	0. 00697	9. 85294	7	46	1 | 1. 6 2 | 3. 2
55	9. 84605	7	9. 99318	15	0. 00682	9. 85287	8	45	3 | 4. 8
56	9. 84612	8	9. 99333	15	0. 00667	9. 85279	7	44	4 | 6. 4 5 | 8. 0
57	9. 84620	8	9. 99348	15	0. 00652	9. 85272	7	43	6 | 9. 6
58	9. 84628	7	9. 99363	15	0. 00637	9. 85265	8	42	7 | 11. 2
59	9. 84635	8	9. 99378	16	0. 00622	9. 85257	7	41	8 | 12. 8 9 | 14. 4
60	9. 84643	8	9. 99394	15	0. 00606	9. 85250	8	40	
61	9. 84651	8	9. 99409	15	0. 00591	9. 85242	7	39	
62	9. 84659	7	9. 99424	15	0. 00576	9. 85235	8	38	
63	9. 84666	8	9. 99439	15	0. 00561	9. 85227	7	37	
64	9. 84674	8	9. 99454	15	0. 00546	9. 85220	8	36	15
65	9. 84682	7	9. 99469	16	0. 00531	9. 85212	7	35	1 | 1. 5
66	9. 84689	8	9. 99485	15	0. 00515	9. 85205	8	34	2 | 3. 0 3 | 4. 5
67	9. 84697	8	9. 99500	15	0. 00500	9. 85197	7	33	4 | 6. 0
68	9. 84705	7	9. 99515	15	0. 00485	9. 85190	8	32	5 | 7. 5
69	9. 84712	8	9. 99530	15	0. 00470	9. 85182	7	31	6 | 9. 0 7 | 10. 5
70	9. 84720	8	9. 99545	15	0. 00455	9. 85175	8	30	8 | 12. 0 9 | 13. 5
71	9. 84728	7	9. 99560	16	0. 00440	9. 85167	7	29	
72	9. 84735	8	9. 99576	15	0. 00424	9. 85160	8	28	
73	9. 84743	8	9. 99591	15	0. 00409	9. 85152	7	27	
74	9. 84751	7	9. 99606	15	0. 00394	9. 85145	8	26	
75	9. 84758	8	9. 99621	15	0. 00379	9. 85137	7	25	
76	9. 84766	7	9. 99636	15	0. 00364	9. 85130	8	24	
77	9. 84773	8	9. 99651	15	0. 00349	9. 85122	7	23	8
78	9. 84781	8	9. 99666	16	0. 00334	9. 85115	8	22	
79	9. 84789	7	9. 99682	15	0. 00318	9. 85107	7	21	1 | 0. 8 2 | 1. 6
80	9. 84796	8	9. 99697	15	0. 00303	9. 85100	8	20	3 | 2. 4 4 | 3. 2
81	9. 84804	8	9. 99712	15	0. 00288	9. 85092	7	19	5 | 4. 0
82	9. 84812	7	9. 99727	15	0. 00273	9. 85085	8	18	6 | 4. 8
83	9. 84819	8	9. 99742	15	0. 00258	9. 85077	8	17	7 | 5. 6 8 | 6. 4
84	9. 84827	8	9. 99757	16	0. 00243	9. 85069	7	16	9 | 7. 2
85	9. 84835	7	9. 99773	15	0. 00227	9. 85062	8	15	
86	9. 84842	8	9. 99788	15	0. 00212	9. 85054	7	14	
87	9. 84850	7	9. 99803	15	0. 00197	9. 85047	8	13	
88	9. 84857	8	9. 99818	15	0. 00182	9. 85039	7	12	
89	9. 84865	8	9. 99833	15	0. 00167	9. 85032	8	11	
90	9. 84873	7	9. 99848	16	0. 00152	9. 85024	7	10	7
91	9. 84880	8	9. 99864	15	0. 00136	9. 85017	8	09	1 | 0. 7 2 | 1. 4
92	9. 84888	7	9. 99879	15	0. 00121	9. 85009	8	08	3 | 2. 1
93	9. 84895	8	9. 99894	15	0. 00106	9. 85001	7	07	4 | 2. 8 5 | 3. 5
94	9. 84903	8	9. 99909	15	0. 00091	9. 84994	8	06	6 | 4. 2
95	9. 84911	7	9. 99924	15	0. 00076	9. 84986	7	05	7 | 4. 9
96	9. 84918	8	9. 99939	16	0. 00061	9. 84979	8	04	8 | 5. 6 9 | 6. 3
97	9. 84926	7	9. 99955	15	0. 00045	9. 84971	7	03	
98	9. 84933	8	9. 99970	15	0. 00030	9. 84964	8	02	
99	9. 84941	8	9. 99985	15	0. 00015	9. 84956	7	01	
100	9. 84949		10. 00000		0. 00000	9. 84949		00	
	Cos.	d.	Cot.	d. c.	Tan.	Sin.	d.		Prop. Pts.
	45°								

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TABLE LIII

COMMON LOGARITHMS OF FUNCTIONS OF ANGLES IN MILS

0—	° ′ ″	sin	cos	tan	cot	Mils
00	000000	——	10. 00000	——	α	100
01	0 03 22. 5	6. 99200	10. 00000	6. 99200	3. 00800	99
02	0 06 45. 0	7. 29303	10. 00000	7. 29303	2. 70697	98
03	0 10 07. 5	7. 46912	10. 00000	7. 46912	2. 53088	97
04	0 13 30. 0	7. 59406	10. 00000	7. 59406	2. 40594	96
05	0 16 52. 5	7. 69097	10. 00000	7. 69098	2. 30903	95
06	0 20 15. 0	7. 77015	9. 99999	7. 77016	2. 22984	94
07	0 23 37. 5	7. 83709	9. 99999	7. 83710	2. 16290	93
08	0 27 00. 0	7. 89509	9. 99999	7. 89510	2. 10490	92
09	0 30 32. 5	7. 94624	9. 99998	7. 94625	2. 05375	91
10	0 33 45. 0	7. 99199	9. 99998	7. 99201	2. 00799	90
11	0 37 07. 5	8. 03338	9. 99997	8. 03340	1. 96660	89
12	0 40 30. 0	8. 07117	9. 99997	8. 07120	1. 92880	88
13	0 43 52. 5	8. 10593	9. 99996	8. 10597	1. 89403	87
14	0 47 15. 0	8. 13811	9. 99996	8. 13816	1. 86184	86
15	0 50 37. 5	8. 16808	9. 99995	8. 16812	1. 83188	85
16	0 54 00. 0	8. 19610	9. 99995	8. 19616	1. 80384	84
17	0 57 22. 5	8. 22243	9. 99994	8. 22249	1. 77751	83
18	1 00 45. 0	8. 24725	9. 99993	8. 24732	1. 75268	82
19	1 04 07. 5	8. 27073	9. 99992	8. 27080	1. 72920	81
20	1 07 30. 0	8. 29300	9. 99992	8. 29309	1. 70691	80
21	1 10 52. 5	8. 31419	9. 99991	8. 31428	1. 68572	79
22	1 14 15. 0	8. 33439	9. 99990	8. 33449	1. 66551	78
23	1 17 37. 5	8. 35369	9. 99989	8. 35380	1. 64620	77
24	1 21 00. 0	8. 37217	9. 99988	8. 37229	1. 62771	76
25	1 24 22. 5	8. 38990	9. 99987	8. 39003	1. 60997	75
26	1 27 45. 0	8. 40693	9. 99986	8. 40707	1. 59293	74
27	1 31 07. 5	8. 42331	9. 99985	8. 42347	1. 57653	73
28	1 34 30. 0	8. 43910	9. 99984	8. 43927	1. 56073	72
29	1 37 52. 5	8. 45434	9. 99982	8. 45452	1. 54548	71
30	1 41 15. 0	8. 46906	9. 99981	8. 46925	1. 53075	70
31	1 44 37. 5	8. 48329	9. 99980	8. 48350	1. 51650	69
32	1 48 00. 0	8. 49708	9. 99979	8. 49729	1. 50271	68
33	1 51 22. 5	8. 51043	9. 99977	8. 51067	1. 48933	67
34	1 54 45. 0	8. 52340	9. 99976	8. 52364	1. 47636	66
35	1 58 07. 5	8. 53598	9. 99974	8. 53623	1. 46376	65
36	2 01 30. 0	8. 54821	9. 99973	8. 54848	1. 45152	64
37	2 04 52. 5	8. 56011	9. 99971	8. 56039	1. 43961	63
38	2 08 15. 0	8. 57168	9. 99970	8. 57199	1. 42801	62
39	2 11 37. 5	8. 58296	9. 99968	8. 58328	1. 41672	61
40	2 15 00. 0	8. 59395	9. 99967	8. 59428	1. 40572	60
41	2 18 22. 5	8. 60467	9. 99965	8. 60502	1. 39498	59
42	2 21 45. 0	8. 61513	9. 99963	8. 61550	1. 38450	58
43	2 25 07. 5	8. 62533	9. 99961	8. 62573	1. 37427	57
44	2 28 30. 0	8. 63532	9. 99959	8. 63572	1. 36428	56
45	2 31 52. 5	8. 64507	9. 99958	8. 64550	1. 35450	55
46	2 35 15. 0	8. 65461	9. 99956	8. 65505	1. 34495	54
47	2 38 37. 5	8. 66394	9. 99954	8. 66441	1. 33559	53
48	2 42 00. 0	8. 67308	9. 99952	8. 67356	1. 32644	52
49	2 45 22. 5	8. 68203	9. 99950	8. 68253	1. 31747	51
50	2 48 45. 0	8. 69080	9. 99948	8. 69132	1. 30868	50
Mils.	° ′ ″	cos	sin	cot	tan	15—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

0—	° ′ ″	sin	cos	tan	cot	Mils
50	2 48 45.0	8.69080	9.99948	8.69132	1.30868	50
51	2 52 07.5	8.69939	9.99946	8.69993	1.30007	49
52	2 55 30.0	8.70781	9.99943	8.70838	1.29162	48
53	2 58 52.5	8.71608	9.99941	8.71667	1.28333	47
54	3 02 15.0	8.72119	9.99939	8.72480	1.27520	46
55	3 05 37.5	8.73215	9.99937	8.73278	1.26722	45
56	3 09 00.0	8.73997	9.99934	8.74063	1.25937	44
57	3 12 22.5	8.74765	9.99932	8.74833	1.25167	43
58	3 15 45.0	8.75519	9.99930	8.75590	1.24410	42
59	3 19 07.5	8.76260	9.99927	8.76334	1.23666	41
60	3 22 30.0	8.76990	9.99925	8.77065	1.22935	40
61	3 25 52.5	8.77707	9.99922	8.77785	1.22215	39
62	3 29 15.0	8.78412	9.99919	8.78493	1.21507	38
63	3 32 37.5	8.79106	9.99917	8.79189	1.20811	37
64	3 36 00.0	8.79789	9.99914	8.79875	1.20125	36
65	3 39 22.5	8.80462	9.99912	8.80550	1.19450	35
66	3 42 45.0	8.81124	9.99909	8.81215	1.18785	34
67	3 46 07.5	8.81776	9.99906	8.81870	1.18130	33
68	3 49 30.0	8.82419	9.99903	8.82515	1.17485	32
69	3 52 52.5	8.83052	9.99900	8.83150	1.16850	31
70	3 56 15.0	8.83676	9.99897	8.83778	1.16222	30
71	3 59 37.5	8.84291	9.99894	8.84396	1.15604	29
72	4 03 00.0	8.84897	9.99891	8.85006	1.14994	28
73	4 06 22.5	8.85495	9.99888	8.85607	1.14393	27
74	4 09 45.0	8.86085	9.99885	8.86200	1.13800	26
75	4 13 07.5	8.86667	9 99882	8.86785	1.13215	25
76	4 16 30.0	8.87241	9.99879	8.87362	1.12638	24
77	4 19 52.5	8.87808	9.99876	8.87932	1.12068	23
78	4 23 15.0	8.88367	9.99873	8.88494	1.11506	22
79	4 26 37.5	8.88919	9.99869	8.89050	1.10950	21
80	4 30 00.0	8.89464	9.99866	8.89598	1.10402	20
81	4 33 22.5	8.90003	9.99863	8.90140	1.09860	19
82	4 36 45.0	8.90534	9.99859	8.90675	1.09325	18
83	4 40 07.5	8.91060	9.99856	8.91204	1.08796	17
84	4 43 30.0	8.91579	9.99852	8.91727	1.08273	16
85	4 46 52.5	8.92091	9.99849	8.92243	1.07757	15
86	4 50 15.0	8.92598	9.99845	8.92753	1.07247	14
87	4 53 37.5	8.93099	9.99841	8.93258	1.06742	13
88	4 57 00.0	8.93594	9.99838	8.93757	1.06243	12
89	5 00 22.5	8.94084	9.99834	8.94250	1.05750	11
90	5 03 45.0	8.94568	9.99830	8.94737	1.05263	10
91	5 07 07.5	8.95046	9.99826	8.95220	1.04780	09
92	5 10 30.0	8.95520	9.99823	8.95697	1.04303	08
93	5 13 52.5	8.95988	9.99819	8.96169	1.03831	07
94	5 17 15.0	8.96451	9.99815	8.96636	1.03364	06
95	5 20 37.5	8.96909	9.99811	8.97099	1.02901	05
96	5 24 00.0	8.97363	9.99807	8.97556	1.02444	04
97	5 27 22.5	8.97812	9.99803	8.98009	1.01991	03
98	5 30 45.0	8.98256	9.99799	8.98457	1.01543	02
99	5 34 07.5	8.98695	9.99795	8.98901	1.01099	01
100	5 37 30.0	8.99130	9.99790	8.99340	1.00660	00
Mils	° ′ ″	cos	sin	cot	tan	15—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

1—	° ′ ″	sin	cos	tan	cot	Mils
00	5 37 30.0	8.99130	9.99790	8.99340	1.00660	100
01	5 40 52.5	8.99561	9.99786	8.99775	1.00225	99
02	5 44 15.0	8.99987	9.99782	9.00206	0.99794	98
03	5 47 37.5	9.00410	9.99778	9.00632	0.99368	97
04	5 51 00.0	9.00828	9.99773	9.01055	0.98945	96
05	5 54 22.5	9.01242	9.99769	9.01473	0.98527	95
06	5 57 45.0	9.01652	9.99764	9.01888	0.98112	94
07	6 01 07.5	9.02058	9.99760	9.02299	0.97701	93
08	6 04 30.0	9.02461	9.99755	9.02706	0.97294	92
09	6 07 52.5	9.02860	9.99751	9.03109	0.96891	91
10	6 11 15.0	9.03255	9.99746	9.03509	0.96491	90
11	6 14 37.5	9.03646	9.99742	9.03905	0.96095	89
12	6 18 00.0	9.04034	9.99737	9.04297	0.95703	88
13	6 21 22.5	9.04419	9.99732	9.04687	0.95313	87
14	6 24 45.0	9.04800	9.99727	9.05072	0.94928	86
15	6 28 07.5	9.05177	9.99723	9.05455	0.94545	85
16	6 31 30.0	9.05552	9.99718	9.05834	0.94166	84
17	6 34 52.5	9.05923	9.99713	9.06210	0.93790	83
18	6 38 15.0	9.06291	9.99708	9.06583	0.93417	82
19	6 41 37.5	9.06656	9.99703	9.06953	0.93047	81
20	6 45 00.0	9.07018	9.99698	9.07320	0.92680	80
21	6 48 22.5	9.07376	9.99693	9.07683	0.92317	79
22	6 51 45.0	9.07732	9.99688	9.08044	0.91956	78
23	6 55 07.5	9.08085	9.99683	9.08402	0.91598	77
24	6 58 30.0	9.08435	9.99677	9.08757	0.91243	76
25	7 01 52.5	9.08782	9.99672	9.09109	0.90891	75
26	7 05 15.0	9.09126	9.99667	9.09459	0.90541	74
27	7 08 37.5	9.09468	9.99662	9.09806	0.90194	73
28	7 12 00.0	9.09807	9.99656	9.10150	0.89850	72
29	7 15 22.5	9.10143	9.99651	9.10492	0.89508	71
30	7 18 45.0	9.10476	9.99645	9.10831	0.89169	70
31	7 22 07.5	9.10807	9.99640	9.11168	0.88832	69
32	7 25 30.0	9.11136	9.99634	9.11501	0.88499	68
33	7 28 52.5	9.11462	9.99629	9.11833	0.88167	67
34	7 32 15.0	9.11785	9.99623	9.12162	0.87838	66
35	7 35 37.5	9.12106	9.99617	9.12489	0.87511	65
36	7 39 00.0	9.12425	9.99612	9.12813	0.87187	64
37	7 42 22.5	9.12741	9.99606	9.13135	0.86865	63
38	7 45 45.0	9.13055	9.99600	9.13455	0.86545	62
39	7 49 07.5	9.13367	9.99594	9.13772	0.86228	61
40	7 52 30.0	9.13676	9.99588	9.14087	0.85913	60
41	7 55 52.5	9.13983	9.99583	9.14401	0.85599	59
42	7 59 15.0	9.14288	9.95577	9.14711	0.85289	58
43	8 02 37.5	9.14591	9.99571	9.15020	0.84980	57
44	8 06 00.0	9.14891	9.99565	9.15327	0.84673	56
45	8 09 22.5	9.15190	9.99558	9.15632	0.84368	55
46	8 12 45.0	9.15486	9.99552	9.15934	0.84066	54
47	8 16 07.5	9.15781	9.99546	9.16235	0.83765	53
48	8 19 30.0	9.16073	9.99540	9.16533	0.83467	52
49	8 22 52.5	9.16364	9.99534	9.16830	0.83170	51
50	8 26 15.0	9.16652	9.99527	9.17125	0.82875	50
Mils	° ′ ″	cos	sin	cot	tan	14—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

1—	° ′ ″	sin	cos	tan	cot	Mils
50	8 26 15.0	9.16652	9.99527	9.17125	0.82875	50
51	8 29 37.5	9.16938	9.99521	9.17417	0.82583	49
52	8 33 00.0	9.17223	9.99515	9.17708	0.82292	48
53	8 36 22.5	9.17506	9.99508	9.17997	0.82003	47
54	8 39 45.0	9.17786	9.99502	9.18285	0.81715	46
55	8 43 07.5	9.18065	9.99495	9.18570	0.81430	45
56	8 46 30.0	9.18343	9.99489	9.18854	0.81146	44
57	8 49 52.5	9.18618	9.99482	9.19136	0.80864	43
58	8 53 15.0	9.18891	9.99475	9.19416	0.80584	42
59	8 56 37.5	9.19163	9.99469	9.19695	0.80305	41
60	9 00 00.0	9.19433	9.99462	9.19971	9.80029	40
61	9 03 22.5	9.19702	9.99455	9.20246	0.79754	39
62	9 06 45.0	9.19968	9.99448	9.20520	0.79480	38
63	9 10 07.5	9.20233	9.99442	9.20792	0.79208	37
64	9 13 30.0	9.20497	9.99435	9.21062	0.78938	36
65	9 16 52.5	9.20758	9.99428	9.21331	0.78669	35
66	9 20 15.0	9.21018	9.99421	9.21598	0.78402	34
67	9 23 37.5	9.21277	9.99414	9.21863	0.78137	33
68	9 27 00.0	9.21534	9.99407	9.22127	0.77873	32
69	9 30 22.5	9.21789	9.99399	9.22390	0.77610	31
70	9 33 45.0	9.22043	9.99392	9.22651	0.77349	30
71	9 37 07.5	9.22295	9.99385	9.22910	0.77090	29
72	9 40 30.0	9.22546	9.99378	9.23168	0.76832	28
73	9 43 52.5	9.22796	9.99371	9.23425	0.76575	27
74	9 47 15.0	9.23043	9.99363	9.23680	0.76320	26
75	9 50 37.5	9.23290	9.99356	9.23934	0.76066	25
76	9 54 00.0	9.23535	9.99348	9.24186	0.75814	24
77	9 57 22.5	9.23779	9.99341	9.24438	0.75562	23
78	10 00 45.0	9.24021	9.99333	9.24687	0.75313	22
79	10 04 07.5	9.24262	9.99326	9.24936	0.75064	21
80	10 07 30.0	9.24501	9.99318	9.25183	0.74817	20
81	10 10 52.5	9.24739	9.99311	9.25428	0.74572	19
82	10 14 15.0	9.24976	9.99303	9.25673	0.74327	18
83	10 17 37.5	9.25211	9.99295	9.25916	0.74084	17
84	10 21 00.0	9.25445	9.99288	9.26158	0.73842	16
85	10 24 22.5	9.25678	9.99280	9.26398	0.73602	15
86	10 27 45.0	9.25910	9.99272	9.26638	0.73362	14
87	10 31 07.5	9.26140	9.99264	9.26876	0.73124	13
88	10 34 30.0	9.26369	9.99256	9.27113	0.72887	12
89	10 37 52.5	9.26597	9.99248	9.27349	0.72651	11
90	10 41 15.0	9.26823	9.99240	9.27583	0.72417	10
91	10 44 37.5	9.27049	9.99232	9.27817	0.72183	09
92	10 48 00.0	9.27273	9.99224	9.28049	0.71951	08
93	10 51 22.5	9.27496	9.99216	9.28280	0.71720	07
94	10 54 45.0	9.27717	9.99207	9.28510	0.71490	06
95	10 58 07.5	9.27938	9.99199	9.28739	0.71261	05
96	11 01 30.0	9.28157	9.99191	9.28966	0.71034	04
97	11 04 52.5	9.28376	9.99183	9.29193	0.70807	03
98	11 08 15.0	9.28593	9.99174	9.29418	0.70582	02
99	11 11 37.5	9.28809	9.99166	9.29643	0.70357	01
100	11 15 00.0	9.29024	9.99157	9.29866	0.70134	00
Mils	° ′ ″	cos	sin	cot	tan	14—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

2—	° ′ ″	sin	cos	tan	cot	Mils
00	11 15 00.0	9.29024	9.99157	9.29866	0.70134	100
01	11 18 22.5	9.29237	9.99149	9.30088	0.69912	99
02	11 21 45.0	9.29450	9.99140	9.30310	0.69690	98
03	11 25 07.5	9.29662	9.99132	9.30530	0.69470	97
04	11 28 30.0	9.29872	9.99123	9.30749	0.69251	96
05	11 31 52.5	9.30082	9.99114	9.30967	0.69033	95
06	11 35 15.0	9.30290	9.99106	9.31185	0.68815	94
07	11 38 37.5	9.30498	9.99097	9.31401	0.68599	93
08	11 42 00.0	9.30704	9.99088	9.31616	0.68384	92
09	11 45 22.5	9.30909	9.99079	9.31830	0.68170	91
10	11 48 45.0	9.31114	9.99070	9.32043	0.67957	90
11	11 52 07.5	9.31317	9.99061	9.32256	0.67744	89
12	11 55 30.0	9.31520	9.99052	9.32467	0.67533	88
13	11 58 52.5	9.31721	9.99043	9.32678	0.67322	87
14	12 02 15.0	9.31921	9.99034	9.32887	0.67113	86
15	12 05 37.5	9.32121	9.99025	9.33096	0.66904	85
16	12 09 00.0	9.32319	9.99016	9.33303	0.66697	84
17	12 12 22.5	9.32517	9.99007	9.33510	0.66490	83
18	12 15 45.0	9.32714	9.98998	9.33716	0.66284	82
19	12 19 07.5	9.32909	9.98988	9.33921	0.66079	81
20	12 22 30.0	9.33104	9.98979	9.34125	0.65875	80
21	12 25 52.5	9.33298	9.98970	9.34328	0.65672	79
22	12 29 15.0	9.33491	9.98960	9.34531	0.65469	78
23	12 32 37.5	9.33683	9.98951	9.34732	0.65268	77
24	12 36 00.0	9.33874	9.98941	9.34933	0.65067	76
25	12 39 22.5	9.34064	9.98932	9.35133	0.64867	75
26	12 42 45.0	9.34254	9.98922	9.35332	0.64668	74
27	12 46 07.5	9.34442	9.98912	9.35530	0.64470	73
28	12 49 30.0	9.34630	9.98903	9.35727	0.64273	72
29	12 52 52.5	9.34817	9.98893	9.35924	0.64076	71
30	12 56 15.0	9.35003	9.98883	9.36120	0.63880	70
31	12 59 37.5	9.35188	9.98873	9.36315	0.63685	69
32	13 03 00.0	9.35373	9.98864	9.36509	0.63491	68
33	13 06 22.5	9.35556	9.98854	9.36702	0.63298	67
34	13 09 45.0	9.35739	9.98844	9.36895	0.63105	66
35	13 13 07.5	9.35921	9.98834	9.37087	0.62913	65
36	13 16 30.0	9.36102	9.98824	9.37278	0.62722	64
37	13 19 52.5	9.36282	9.98814	9.37469	0.62531	63
38	13 23 15.0	9.36462	9.98804	9.37658	0.62342	62
39	13 26 37.5	9.36641	9.98793	9.37847	0.62153	61
40	13 30 00.0	9.36819	9.98783	9.38035	0.61965	60
41	13 33 22.5	9.36996	9.98773	9.38223	0.61777	59
42	13 36 45.0	9.37172	9.98763	9.38410	0.61590	58
43	13 40 07.5	9.37348	9.98752	9.38596	0.61404	57
44	13 43 30.0	9.37523	9.98742	9.38781	0.61219	56
45	13 46 52.5	9.37697	9.98731	9.38966	0.61034	55
46	13 50 15.0	9.37870	9.98721	9.39150	0.60850	54
47	13 53 37.5	9.38043	9.98710	9.39333	0.60667	53
48	13 57 00.0	9.38215	9.98700	9.39515	0.60485	52
49	14 00 22.5	9.38387	9.98689	9.39697	0.60303	51
50	14 03 45.0	9.38557	9.98679	9.39879	0.60121	50
Mils	° ′ ″	cos	sin	cot	tan	13—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

2—	° ′ ″	sin	cos	tan	cot	Mils
50	14 03 45.0	9.38557	9.98679	9.39879	0.60121	50
51	14 07 07.5	9.38727	9.98668	9.40059	0.59941	49
52	14 10 30.0	9.38896	9.98657	9.40239	0.59761	48
53	14 13 52.5	9.39065	9.98646	9.40418	0.59582	47
54	14 17 15.0	9.39232	9.98635	9.40597	0.59403	46
55	14 20 37.5	9.39399	9.98625	9.40775	0.59225	45
56	14 24 00.0	9.39566	9.98614	9.40952	0.59048	44
57	14 27 22.5	9.39732	9.98603	9.41129	0.58871	43
58	14 30 45.0	9.39897	9.98592	9.41305	0.58695	42
59	14 34 07.5	9.40061	9.98581	9.41480	0.58520	41
60	14 37 30.0	9.40225	9.98570	9.41655	0.58345	40
61	14 40 52.5	9.40388	9.98558	9.41829	0.58171	39
62	14 44 15.0	9.40551	9.98547	9.42003	0.57997	38
63	14 47 37.5	9.40712	9.98536	9.42176	0.57823	37
64	14 51 00.0	9.40873	9.98525	9.42348	0.57652	36
65	14 54 22.5	9.41034	9.98513	9.42520	0.57480	35
66	14 57 45.0	9.41193	9.98502	9.42691	0.57309	34
67	15 01 07.5	9.41353	9.98491	9.42862	0.57138	33
68	15 04 30.0	9.41511	9.98479	9.43032	0.56968	32
69	15 07 52.5	9.41669	9.98468	9.43202	0.56798	31
70	15 11 15.0	9.41827	9.98456	9.43371	0.56629	30
71	15 14 37.5	9.41983	9.98444	9.43539	0.56461	29
72	15 18 00.0	9.42140	9.98433	9.43707	0.56293	28
73	15 21 22.5	9.42295	9.98421	9.43874	0.56126	27
74	15 24 45.0	9.42450	9.98409	9.44011	0.55959	26
75	15 28 07.5	9.42604	9.98398	9.44207	0.55793	25
76	15 31 30.0	9.42758	9.98386	9.44372	0.55628	24
77	15 34 52.5	9.42911	9.98374	9.44537	0.55463	23
78	15 38 15.0	9.43064	9.98362	9.44702	0.55298	22
79	15 41 37.5	9.43216	9.98350	9.44866	0.55134	21
80	15 45 00.0	9.43367	9.98338	9.45029	0.54971	20
81	15 18 22.5	9.43518	9.98326	9.45192	0.54808	19
82	15 51 45.0	9.43669	9.98314	9.45355	0.54645	18
83	15 55 07.5	9.43818	9.98302	9.45517	0.54483	17
84	15 58 30.0	9.43968	9.98290	9.45678	0.54322	16
85	16 01 52.5	9.44116	9.98277	9.45839	0.54161	15
86	16 05 15.0	9.44264	9.98265	9.45999	0.54001	14
87	16 08 37.5	9.44412	9.98253	9.46159	0.53841	13
88	16 12 00.0	9.44559	9.98240	9.46319	0.53681	12
89	16 15 22.5	9.44705	9.98228	9.46478	0.53522	11
90	16 18 45.0	9.44851	9.98216	9.46636	0.53364	10
91	16 22 07.5	9.44997	9.98203	9.46794	0.53206	09
92	16 25 30.0	9.45142	9.98190	9.46951	0.53049	08
93	16 28 52.5	9.45286	9.98178	9.47108	0.52892	07
94	16 32 15.0	9.45430	9.98165	9.47265	0.52735	06
95	16 35 37.5	9.45573	9.98153	9.47421	0.52579	05
96	16 39 00.0	9.45716	9.98140	9.47576	0.52424	04
97	16 42 22.5	9.45858	9.98127	9.47731	0.52269	03
98	16 45 45.0	9.46000	9.98114	9.47886	0.52114	02
99	16 49 07.5	9.46142	9.98101	9.48040	0.51960	01
100	16 52 30.0	9.46282	9.98088	9.48194	0.51806	00
Mils	° ′ ″	cos	sin	cot	tan	13—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

3—	° ′ ″	sin	cos	tan	cot	Mils
00	16 52 30.0	9.46282	9.98088	9.48194	0.51806	100
01	16 55 52.5	9.46423	9.98076	9.48347	0.51653	99
02	16 59 15.0	9.46563	9.98063	9.48500	0.51500	98
03	17 02 37.5	9.46702	9.98050	9.48652	0.51348	97
04	17 06 00.0	9.46841	9.98036	9.48804	0.51196	96
05	17 09 22.5	9.46979	9.98023	9.48956	0.51044	95
06	17 12 45.0	9.47117	9.98010	9.49107	0.50893	94
07	17 16 07.5	9.47254	9.97997	9.49257	0.50743	93
08	17 19 30.0	9.47391	9.97984	9.49408	0.50592	92
09	17 22 52.5	9.47528	9.97970	9.49557	0.50443	91
10	17 26 15.0	9.47664	9.97957	9.49707	0.50293	90
11	17 29 37.5	9.47799	9.97943	9.49856	0.50144	89
12	17 33 00.0	9.47934	9.97930	9.50004	0.49996	88
13	17 36 22.5	9.48069	9.97917	9.50152	0.49848	87
14	17 39 45.0	9.48203	9.97903	9.50300	0.49700	86
15	17 43 07.5	9.48337	9.97889	9.50447	0.49553	85
16	17 46 30.0	9.48470	9.97876	9.50594	0.49406	84
17	17 49 52.5	9.48603	9.97862	9.50741	0.49259	83
18	17 53 15.0	9.48735	9.97848	9.50887	0.49113	82
19	17 56 37.5	9.48867	9.97834	9.51032	0.48968	81
20	18 00 00.0	9.48998	9.97821	9.51178	0.48822	80
21	18 03 22.5	9.49129	9.97807	9.51322	0.48678	79
22	18 06 45.0	9.49260	9.97793	9.51467	0.48533	78
23	18 10 07.5	9.49390	9.97779	9.51611	0.48389	77
24	18 13 30.0	9.49520	9.97765	9.51755	0.48245	76
25	18 16 52.5	9.49649	9.97751	9.51898	0.48102	75
26	18 20 15.0	9.49778	9.97737	9.52041	0.47959	74
27	18 23 37.5	9.49906	9.97722	9.52184	0.47816	73
28	18 27 00.0	9.50034	9.97708	9.52326	0.47674	72
29	18 30 22.5	9.50162	9.97694	9.52468	0.47532	71
30	18 33 45.0	9.50289	9.97680	9.52609	0.47391	70
31	18 37 07.5	9.50416	9.97665	9.52750	0.47250	69
32	18 40 30.0	9.50542	9.97651	9.52891	0.47109	68
33	18 43 52.5	9.50668	9.97637	9.53031	0.46969	67
34	18 47 15.0	9.50794	9.97622	9.53171	0.46829	66
35	18 50 37.5	9.50919	9.97608	9.53311	0.46689	65
36	18 54 00.0	9.51043	9.97593	9.53450	0.46550	64
37	18 57 22.5	9.51168	9.97578	9.53589	0.46411	63
38	19 00 45.0	9.51292	9.97564	9.53728	0.46272	62
39	19 04 07.5	9.51415	9.97549	9.53866	0.46134	61
40	19 07 30.0	9.51538	9.97534	9.54004	0.45996	60
41	19 10 52.5	9.51661	9.97519	9.54142	0.45858	59
42	19 14 15.0	9.51784	9.97505	9.54279	0.45721	58
43	19 17 37.5	9.51906	9.97490	9.54416	0.45584	57
44	19 21 00.0	9.52027	9.97475	9.54552	0.45448	56
45	19 24 22.5	9.52148	9.97460	9.54689	0.45311	55
46	19 27 45.0	9.52269	9.97445	9.54824	0.45176	54
47	19 31 07.5	9.52390	9.97430	9.54960	0.45040	53
48	19 34 30.0	9.52510	9.97414	9.55095	0.44905	52
49	19 37 52.5	9.52629	9.97399	9.55230	0.44770	51
50	19 41 15.0	9.52749	9.97384	9.55365	0.44635	50
Mils	° ′ ″	cos	sin	cot	tan	12—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

3—	° ′ ″	sin	cos	tan	cot	Mils
50	19 41 15.0	9.52749	9.97384	9.55365	0.44635	50
51	19 44 37.5	9.52868	9.97369	9.55499	0.44501	49
52	19 48 00.0	9.52986	9.97353	9.55633	0.44367	48
53	19 51 22.5	9.53105	9.97338	9.55767	0.44233	47
54	19 54 45.0	9.53223	9.97323	9.55900	0.44000	46
55	19 58 07.5	9.53340	9.97307	9.56033	0.43967	45
56	20 01 30.0	9 53457	9.97292	9.56166	0.43834	44
57	20 04 52.5	9.53574	9.97276	9.56298	0.43702	43
58	20 08 15.0	9.53690	9.97261	9.56430	0.43570	42
59	20 11 37.5	9.53807	9.97245	9.56552	0.43438	41
60	20 15 00.0	9.53922	9.97229	9.56693	0.43307	40
61	20 18 22.5	9.54038	9.97213	9.56824	0.43176	39
62	20 21 45.0	9.54153	9.97198	9.56955	0.43045	38
63	20 25 07.5	9.54267	9.97182	9.57086	0.42914	37
64	20 28 30.0	9.54382	9.97166	9.57216	0.42784	36
65	20 31 52.5	9.54496	9.97150	9.57346	0.42654	35
66	20 35 15.0	9.54610	9.97134	9.57476	0.42524	34
67	20 38 37.5	9.54723	9.97118	9.57605	0.42395	33
68	20 42 00.0	9.54836	9.97102	9.57734	0.42266	32
69	20 45 22.5	9.54949	9.97086	9.57863	0.42137	31
70	20 48 45.0	9.55061	9.97069	9.57991	0.42009	30
71	20 52 07.5	9.55173	9.97053	9.58120	0.41880	29
72	20 55 30.0	9.55285	9.97037	9.58248	0.41752	28
73	20 58 52.5	9.55396	9.97021	9.58375	0.41625	27
74	21 02 15.0	9.55507	9.97004	9.58503	0.41497	26
75	21 05 37.5	9.55617	9.96988	9.58630	0.41370	25
76	21 09 00.0	9.55728	9.96971	9.58757	0.41243	24
77	21 12 22.5	9.55838	9.96955	9.58883	0.41117	23
78	21 15 45.0	9.55948	9.96938	9.59009	0.40991	22
79	21 19 07.5	9.56057	9.96922	9.59135	0.40865	21
80	21 22 30.0	9.56166	9.96905	9.59261	0.40739	20
81	21 25 52.5	9.56275	9.96888	9.59387	0.40613	19
82	21 29 15.0	9.56383	9.96872	9.59512	0.40488	18
83	21 32 37.5	9.56492	9.96855	9.59637	0.40363	17
84	21 36 00.0	9.56599	9.96838	9.59762	0.40238	16
85	21 39 22.5	9.56707	9.96821	9.59886	0.40114	15
86	21 42 45.0	9.56814	9.96804	9.60010	0.39990	14
87	21 46 07.5	9.56921	9.96787	9.60134	0.39866	13
88	21 49 30.0	9.57028	9.96770	9.60258	0.39742	12
89	21 52 52.5	9.57134	9.96753	9.60381	0.39619	11
90	21 56 15.0	9.57240	9.96736	9.60504	0.39496	10
91	21 59 37.5	9.57346	9.96719	9.60627	0.39373	09
92	22 03 00.0	9.57451	9.96701	9.60750	0.39250	08
93	22 06 22.5	9.57556	9.96684	9.60872	0.39128	07
94	22 09 45.0	9.57661	9.96667	9.60995	0.39005	06
95	22 13 07.5	9.57766	9.96649	9.61116	0.38884	05
96	22 16 30.0	9.57870	9.96632	9.61238	0.38762	04
97	22 19 52.5	9.57974	9.96614	9.61360	0.38640	03
98	22 23 15.0	9.58078	9.96597	9.61481	0.38519	02
99	22 26 37.5	9.58181	9.96579	9.61602	0.38398	01
100	22 30 00.0	9.58284	9.96562	9.61722	0.38278	00
Mils	° ′ ″	cos	sin	cot	tan	12—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

4—	° ′ ″	sin	cos	tan	cot	Mils
00	22 30 00.0	9.58284	9.96562	9.61722	0.38278	100
01	22 33 22.5	9.58387	9.96544	9.61843	0.38157	99
02	22 36 45.0	9.58489	9.96526	9.61963	0.38037	98
03	22 40 07.5	9.58591	9.96508	9.62083	0.37917	97
04	22 43 30.0	9.58693	9.96490	9.62203	0.37797	96
05	22 46 52.5	9.58795	9.96473	9.62322	0.37678	95
06	22 50 15.0	9.58896	9.96455	9.62442	0.37558	94
07	22 53 37.5	9.58998	9.96437	9.62561	0.37439	93
08	22 57 00.0	9.59098	9.96419	9.62680	0.37320	92
09	23 00 22.5	9.59199	9.96401	9.62798	0.37202	91
10	23 03 45.0	9.59299	9.96382	9.62917	0.37083	90
11	23 07 07.5	9.59339	9.96364	9.63035	0.36965	89
12	23 10 30.0	9.59499	9.96346	9.63153	0.36847	88
13	23 13 52.5	9.59598	9.96328	9.63271	0.36729	87
14	23 17 15.0	9.59698	9.96309	9.63388	0.36612	86
15	23 20 37.5	9.59797	9.96291	9.63505	0.36495	85
16	23 24 00.0	9.59895	9.96273	9.63623	0.36377	84
17	23 27 22.5	9.59994	9.96254	9.63740	0.36260	83
18	23 30 45.0	9.60092	9.96236	9.63856	0.36144	82
19	23 34 07.5	9.60190	9.96217	9.63973	0.36027	81
20	23 37 30.0	9.60287	9.96198	9.64089	0.35911	80
21	23 40 52.5	9.60385	9.96180	9.64205	0.35795	79
22	23 44 15.0	9.60482	9.96161	9.64321	0.35679	78
23	23 47 37.5	9.60578	9.96142	9.64436	0.35564	77
24	23 51 00.0	9.60675	9.96123	9.64552	0.35448	76
25	23 54 22.5	9.60771	9.96105	9.64667	0.35333	75
26	23 57 45.0	9.60867	9.96086	9.64781	0.35219	74
27	24 01 07.5	9.60963	9.96067	9.64897	0.35103	73
28	24 04 30.0	9.61059	9.96048	9.65011	0.34989	72
29	24 07 52.5	9.61154	9.96029	9.65125	0.34875	71
30	24 11 15.0	9.61249	9.96009	9.65240	0.34760	70
31	24 14 37.5	9.61344	9.95990	9.65354	0.34646	69
32	24 18 00.0	9.61438	9.95971	9.65467	0.34533	68
33	24 21 22.5	9.61533	9.95952	9.65581	0.34419	67
34	24 24 45.0	9.61627	9.95932	9.65694	0.34306	66
35	24 28 07.5	9.61721	9.95913	9.65808	0.34192	65
36	24 31 30.0	9.61814	9.95894	9.65921	0.34079	64
37	24 34 52.5	9.61908	9.95874	9.66033	0.33967	63
38	24 38 15.0	9.62001	9.95855	9.66146	0.33854	62
39	24 41 37.5	9.62094	9.95835	9.66258	0.33742	61
40	24 45 00.0	9.62186	9.95815	9.66371	0.33629	60
41	24 48 22.5	9.62278	9.95796	9.66483	0.33517	59
42	24 51 45.0	9.62371	9.95776	9.66595	0.33405	58
43	24 55 07.5	9.62463	9.95756	9.66706	0.33294	57
44	24 58 30.0	9.62554	9.95736	9.66818	0.33182	56
45	25 01 52.5	9.62646	9.95716	9.66929	0.33071	55
46	25 05 15.0	9.62737	9.95697	9.67040	0.32960	54
47	25 08 37.5	9.62828	9.95677	9.67151	0.32849	53
48	25 12 00.0	9.62918	9.95657	9.67262	0.32738	52
49	25 15 22.5	9.63009	9.95636	9.67372	0.32628	51
50	25 18 45.0	9.63099	9.95616	9.67483	0.32517	50
Mils	° ′ ″	cos	sin	cot	tan	11—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

4—	° ′ ″	sin	cos	tan	cot	Mils
50	25 18 45.0	9.63099	9.95616	9.67483	0.32517	50
51	25 22 07.5	9.63189	9.95596	9.67593	0.32407	49
52	25 25 30.0	9.63279	9.95576	9.67703	0.32297	48
53	25 28 52.5	9.63369	9.95556	9.67813	0.32187	47
54	25 32 15.0	9.63458	9.95535	9.67923	0.32077	46
55	25 35 37.5	9.63547	9.95515	9.68032	0.31968	45
56	25 39 00.0	9.63636	9.95494	9.68142	0.31858	44
57	25 42 22.5	9.63725	9.95474	9.68251	0.31749	43
58	25 45 45.0	9.63814	9.95453	9.68360	0.31640	42
59	25 49 07.5	9.63901	9.95433	9.68469	0.31531	41
60	25 52 30.0	9.63989	9.95412	9.68577	0.31423	40
61	25 55 52.5	9.64077	9.95391	9.68686	0.31314	39
62	25 59 15.0	9.64165	9.95371	9.68794	0.31206	38
63	26 02 37.5	9.64252	9.95350	9.68902	0.31098	37
64	26 06 00.0	9.64339	9.95329	9.69010	0.30990	36
65	26 09 22.5	9.64426	9.95308	9.69118	0.30882	35
66	26 12 45.0	9.64513	9.95287	9.69226	0.30774	34
67	26 16 07.5	9.64599	9.95266	9.69333	0.30667	33
68	26 19 30.0	9.64686	9.95245	9.69441	0.30559	32
69	26 22 52.5	9.64772	9.95224	9.69548	0.30452	31
70	26 26 15.0	9.64858	9.95203	9.69655	0.30345	30
71	26 29 37.5	9.64943	9.95181	9.69762	0.30238	29
72	26 33 00.0	9.65029	9.95160	9.69868	0.30132	28
73	26 36 22.5	9.65114	9.95139	9.69975	0.30025	27
74	26 39 45.0	9.65199	9.95117	9.70081	0.29919	26
75	26 43 07.5	9.65284	9.95096	9.70188	0.29812	25
76	26 46 30.0	9.65368	9.95075	9.70294	0.29706	24
77	26 49 52.5	9.65453	9.95053	9.70400	0.29600	23
78	26 53 15.0	9.65537	9.95031	9.70505	0.29495	22
79	26 56 37.5	9.65621	9.95010	9.70611	0.29389	21
80	27 00 00.0	9.65705	9.94988	9.70717	0.29283	20
81	27 03 22.5	9.65788	9.94966	9.70822	0.29178	19
82	27 06 45.0	9.65872	9.94945	9.70927	0.29073	18
83	27 10 07.5	9.65955	9.94923	9.71032	0.28968	17
84	27 13 30.0	9.66038	9.94901	9.71137	0.28863	16
85	27 16 52.5	9.66121	9.94879	9.71242	0.28758	15
86	27 20 15.0	9.66203	9.94857	9.71346	0.28654	14
87	27 23 37.5	9.66286	9.94835	9.71451	0.28549	13
88	27 27 00.0	9.66368	9.94813	9.71555	0.28445	12
89	27 30 22.5	9.66450	9.94790	9.71659	0.28341	11
90	27 33 45.0	9.66531	9.94768	9.71763	0.28237	10
91	27 37 07.5	9.66613	9.94746	9.71867	0.28133	09
92	27 40 30.0	9.66694	9.94724	9.71971	0.28029	08
93	27 43 52.5	9.66776	9.94701	9.72074	0.27926	07
94	27 47 15.0	9.66857	9.94679	9.72178	0.27822	06
95	27 50 37.5	9.66937	9.94656	9.72281	0.27719	05
96	27 54 00.0	9.67018	9.94634	9.72384	0.27616	04
97	27 57 22.5	9.67099	9.94611	9.72487	0.27513	03
98	28 00 45.0	9.67179	9.94588	9.72590	0.27410	02
99	28 04 07.5	9.67259	9.94566	9.72693	0.27307	01
100	28 07 30.0	9.67339	9.94543	9.72796	0.27204	00
Mils	° ′ ″	cos	sin	cot	tan	11—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

5—	° ′ ″	sin	cos	tan	cot	Mils
00	28 07 30.0	9.67339	9.94543	9.72796	0.27204	100
01	28 10 52.5	9.67418	9.94520	9.72898	0.27102	99
02	28 14 15.0	9.67498	9.94497	9.73001	0.26999	98
03	28 17 37.5	9.67577	9.94474	9.73103	0.26897	97
04	28 21 00.0	9.67656	9.94451	9.73205	0.26795	96
05	28 24 22.5	9.67735	9.94428	9.73307	0.26693	95
06	28 27 45.0	9.67814	9.94405	9.73409	0.26591	94
07	28 31 07.5	9.67892	9.94382	9.73510	9.26490	93
08	28 34 30.0	9.67971	9.94359	9.73612	0.26388	92
09	28 37 52.5	9.68049	9.94336	9.73713	0.26287	91
10	28 41 15.0	9.68127	9.94312	9.73815	0.26185	90
11	28 44 37.5	9.68205	9.94289	9.73916	0.26084	89
12	28 48 00.0	9.68283	9.94266	9.74017	0.25983	88
13	28 51 22.5	9.68360	9.94242	9.74118	0.25882	87
14	28 54 45.0	9.68437	9.94219	9.74219	0.25781	86
15	28 58 07.5	9.68514	9.94195	9.74319	0.25681	85
16	29 01 30.0	9.68591	9.94171	9.74420	0.25580	84
17	29 04 52.5	9.68668	9.94148	9.74520	0.25480	83
18	29 08 15.0	9.68745	9.94124	9.74621	0.25379	82
19	29 11 37.5	9.68821	9.94100	9.74721	0.25279	81
20	29 15 00.0	9.68897	9.94076	9.74821	0.25179	80
21	29 18 22.5	9.68973	9.94052	9.74921	0.25079	79
22	29 21 45.0	9.69049	9.94028	9.75021	0.24979	78
23	29 25 07.5	9.69125	9.94004	9.75120	0.24880	77
24	29 28 30.0	9.69200	9.93980	9.75220	0.24780	76
25	29 31 52.5	9.69276	9.93956	9.75320	0.24680	75
26	29 35 15.0	9.69351	9.93932	9.75419	0.24581	74
27	29 38 37.5	9.69426	9.93908	9.75518	0.24482	73
28	29 42 00.0	9.69501	9.93884	9.75617	0.24383	72
29	29 45 22.5	9.69575	9.93859	9.75716	0.24284	71
30	29 48 45.0	9.69650	9.93835	9.75815	0.24185	70
31	29 52 07.5	9.69724	9.93810	9.75914	0.24086	69
32	29 55 30.0	9.69798	9.93786	9.76013	0.23987	68
33	29 58 52.5	9.69872	9.93761	9.76111	0.23889	67
34	30 02 15.0	9.69946	9.93737	9.76210	0.23790	66
35	30 05 37.5	9.70020	9.93712	9.76308	0.23692	65
36	30 09 00.0	9.70093	9.93687	9.76406	0.23594	64
37	30 12 22.5	9.70167	9.93662	9.76504	0.23496	63
38	30 15 45.0	9.70240	9.93638	9.76602	0.23398	62
39	30 19 07.5	9.70313	9.93613	9.76700	0.23300	61
40	30 22 30.0	9.70386	9.93588	9.76798	0.23202	60
41	30 25 52.5	9.70458	9.93563	9.76896	0.23104	59
42	30 29 15.0	9.70531	9.93538	9.76993	0.23007	58
43	30 32 37.5	9.70603	9.93512	9.77091	0.22909	57
44	30 36 00.0	9.70675	9.93487	9.77188	0.22812	56
45	30 39 22.5	9.70747	9.93462	9.77285	0.22715	55
46	30 42 45.0	9.70819	9.93437	9.77382	0.22618	54
47	30 46 07.5	9.70891	9.93411	9.77479	0.22521	53
48	30 49 30.0	9.70962	9.93386	9.77576	0.22424	52
49	30 52 52.5	9.71034	9.93361	9.77673	0.22327	51
50	30 56 15.0	9.71105	9.93335	9.77770	0.22230	50
Mils	° ′ ″	cos	sin	cot	tan	10—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

5—	° ′ ″	sin	cos	tan	cot	Mils
50	30 56 15.0	9.71105	9.93335	9.77770	0.22230	50
51	30 59 37.5	9.71176	9.93309	9.77867	0.22133	49
52	31 03 00.0	9.71247	9.93284	9.77963	0.22037	48
53	31 06 22.5	9.71318	9.93258	9.78060	0.21940	47
54	31 09 45.0	9.71388	9.93232	9.78156	0.21844	46
55	31 13 07.5	9.71459	9.93206	9.78252	0.21748	45
56	31 16 30.0	9.71529	9.93181	9.78348	0.21652	44
57	31 19 52.5	9.71599	9.93155	9.78444	0.21556	43
58	31 23 15.0	9.71669	9.93129	9.78540	0.21460	42
59	31 26 37.5	9.71739	9.93103	9.78636	0.21364	41
60	31 30 00.0	9.71809	9.93077	9.78732	0.21268	40
61	31 33 22.5	9.71878	9.93050	9.78828	0.21172	39
62	31 36 45.0	9.71947	9.93024	9.78923	0.21077	38
63	31 40 07.5	9.72017	9.92998	9.79019	0.20981	37
64	31 43 30.0	9.72086	9.92972	9.79114	0.20886	36
65	31 46 52.5	9.72154	9.92945	9.79209	0.20791	35
66	31 50 15.0	9.72223	9.92919	9.79304	0.20696	34
67	31 53 37.5	9.72292	9.92892	9.79400	0.20600	33
68	31 57 00.0	9.72360	9.92866	9.79495	0.20505	32
69	32 00 22.5	9.72429	9.92839	9.79589	0.20411	31
70	32 03 45.0	9.72497	9.92812	9.79684	0.20316	30
71	32 07 07.5	9.72565	9.92786	9.79779	0.20221	29
72	32 10 30.0	9.72633	9.92759	9.79874	0.20126	28
73	32 13 52.5	9.72700	9.92732	9.79968	0.20032	27
74	32 17 15.0	9.72768	9.92705	9.80063	0.19937	26
75	32 20 37.5	9.72835	9.92678	9.80157	0.19843	25
76	32 24 00.0	9.72902	9.92651	9.80251	0.19749	24
77	32 27 22.5	9.72970	9.92624	9.80346	0.19654	23
78	32 30 45.0	9.73037	9.92597	9.80440	0.19560	22
79	32 34 07.5	9.73103	9.92570	9.80534	0.19466	21
80	32 37 30.0	9.73170	9.92542	9.80628	0.19372	20
81	32 40 52.5	9.73237	9.92515	9.80721	0.19279	19
82	32 44 15.0	9.73303	9.92488	9.80815	0.19185	18
83	32 47 37.5	9.73369	9.92460	9.80909	0.19091	17
84	32 51 00.0	9.73435	9.92433	9.81003	0.18997	16
85	32 54 22.5	9.73501	9.92405	9.81096	0.18904	15
86	32 57 45.0	9.73567	9.92378	9.81189	0.18811	14
87	33 01 07.5	9.73633	9.92350	9.81283	0.18717	13
88	33 04 30.0	9.73698	9.92322	9.81376	0 18624	12
89	33 07 52.5	9.73764	9.92294	9.81469	0.18531	11
90	33 11 15.0	9.73829	9.92267	9.81562	0.18438	10
91	33 14 37.5	9.73894	9.92239	9.81655	0.18345	09
92	33 18 00.0	9.73959	9.92211	9.81748	0.18252	08
93	33 21 22.5	9.74024	9.92183	9.81841	0.18159	07
94	33 24 45.0	9.74089	9.92154	9.81934	0.18066	06
95	33 28 07.5	9.74152	9.92126	9.82027	0.17973	05
96	33 31 30.0	9.74218	9.92098	9.82119	0.17881	04
97	33 34 52.5	9.74282	9.92070	9.82212	0.17788	03
98	33 38 15.0	9.74346	9.92041	9.82305	0.17695	02
99	33 41 37.5	9.74410	9.92013	9.82397	0.17603	01
100	33 45 00.0	9.74474	9.91985	9.82489	0.17511	00
Mils	° ′ ″	cos	sin	cot	tan	10—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

6—	° ′ ″	sin	cos	tan	cot	Mils
00	33 45 00.0	9.74474	9.91985	9.82489	0.17511	100
01	33 48 22.5	9.74538	9.91956	9.82582	0.17418	99
02	33 51 45.0	9.74601	9.91928	9.82674	0.17326	98
03	33 55 07.5	9.74665	9.91899	9.82766	0.17234	97
04	33 58 30.0	9.74728	9.91870	9.82858	0.17142	96
05	34 01 52.5	9.74791	9.91841	9.82950	0.17050	95
06	34 05 15.0	9.74854	9.91813	9.83042	0.16958	94
07	34 08 37.5	9.74917	9.91784	9.83134	0.16866	93
08	34 12 00.0	9.74980	9.91755	9.83225	0.16775	92
09	34 15 22.5	9.75043	9.91726	9.83317	0.16683	91
10	34 18 45.0	9.75105	9.91697	9.83409	0.16591	90
11	34 22 07.5	9.75168	9.91668	9.83500	0.16500	89
12	34 25 30.0	9.75230	9.91638	9.83592	0.16408	88
13	34 28 52.5	9.75292	9.91609	9.83683	0.16317	87
14	34 32 15.0	9.75354	9.91580	9.83774	0.16226	86
15	34 35 37.5	9.75416	9.91550	9.83866	0.16134	85
16	34 39 00.0	9.75478	9.91521	9.83957	0.16043	84
17	34 42 22.5	9.75539	9.91492	9.84048	0.15952	83
18	34 45 45.0	9.75501	9.91462	9.84139	0.15861	82
19	34 49 07.5	9.75662	9.91432	9.84230	0.15770	81
20	34 52 30.0	9.75724	9.91403	9.84321	0.15679	80
21	34 55 52.5	9.75785	9.91373	9.84412	0.15588	79
22	34 59 15.0	9.75846	9.91343	9 84503	0.15497	78
23	35 02 37.5	9.75096	9.91313	9.84593	0.15407	77
24	35 06 00.0	9.75967	9.91283	9.84684	0.15316	76
25	35 09 22.5	9.76028	9.91253	9.84775	0.15225	75
26	35 12 45.0	9.76088	9.91223	9.84865	0.15135	74
27	35 16 07.5	9.76149	9.91193	9.84956	0.15044	73
28	35 19 30.0	9.76209	9.91163	9.85046	0.14954	72
29	35 22 52.5	9.76269	9.91133	9.85136	0.14861	71
30	35 26 15.0	9.76329	9.91102	9.85227	0.14773	70
31	35 29 37.5	9.76389	9.91072	9.85317	0.14683	69
32	35 33 00.0	9.76448	9.91042	9.85407	0.14593	68
33	35 36 22.5	9.76508	9.91011	9.85497	0.14503	67
34	35 39 45.0	9.76568	9.90980	9.85587	0.14413	66
35	35 43 07.5	9.76627	9.90950	9.85677	0.14323	65
36	35 46 30.0	9.76686	9.90919	9.85767	0.14233	64
37	35 49 52.5	9.76745	9.90888	9.85857	0.14143	63
38	35 53 15.0	9.76804	9.90858	9.85947	0.14053	62
39	35 56 37.5	9.76863	9.90827	9.86037	0.13963	61
40	36 00 00.0	9.76922	9.90796	9.86126	0.13874	60
41	36 03 22.5	9.76980	9.90765	9.86216	0.13784	59
42	36 06 45.0	9.77039	9.90734	9.86305	0.13695	58
43	36 10 06.5	9.77097	9.90703	9.86395	0.13605	57
44	36 13 30.0	9.77156	9.90671	9.86484	0.13516	56
45	36 16 52.5	9.77214	9.90640	9.86574	0.13426	55
46	36 20 15.0	9.77272	9.90609	9.86663	0.13337	54
47	36 23 37.5	9.77330	9.90577	9.86752	0.13248	53
48	36 27 00.0	9.77387	9.90546	9.86842	0.13158	52
49	36 30 22.5	9.77445	9.90514	9.86931	0.13069	51
50	36 33 45.0	9.77503	9.90483	9.87020	0.12980	50
Mils	° ′ ″	cos	sin	cot	tan	9—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

6—	° ′ ″	sin	cos	tan	cot	Mils
50	36 33 45.0	9.77503	9.90483	9.87020	0.12980	50
51	36 37 07.5	9.77560	9.90451	9.87109	0.12891	49
52	36 40 30.0	9.77617	9.90419	9.87198	0.12802	48
53	36 43 52.5	9.77675	9.90388	9.87287	0.12713	47
54	36 47 15.0	9.77732	9.90356	9.87376	0.12624	46
55	36 50 37.5	9.77789	9.90324	9.87465	0.12535	45
56	36 54 00.0	9.77846	9.90292	9.87554	0.12446	44
57	36 57 22.5	9.77902	9.90260	9.87642	0.12358	43
58	37 00 45.0	9.77959	9.90228	9.87731	0.12269	42
59	37 03 07.5	9.78015	9.90196	9.87820	0.12180	41
60	37 07 30.0	9.78072	9.90163	9.87908	0.12092	40
61	37 10 52.5	9.78128	9.90131	9.87997	0.12003	39
62	37 14 15.0	9.78184	9.90099	9.88086	0.11914	38
63	37 17 37.5	9.78240	9.90066	9.88174	0.11826	37
64	37 21 00.0	9.78296	9.90034	9.88262	0.11738	36
65	37 24 22.5	9.78352	9.90001	9.88351	0.11649	35
66	37 27 45.0	9.78408	9.89968	9.88439	0.11561	34
67	37 31 07.5	9.78463	9.89936	9.88527	0.11473	33
68	37 34 30.0	9.78519	9.89903	9.88616	0.11384	32
69	37 37 52.5	9.78574	9.89870	9.88704	0.11296	31
70	37 41 15.0	9.78629	9.89837	9.88792	0.11208	30
71	37 44 37.5	9.78684	9.89804	9.88880	0.11120	29
72	37 48 00.0	9.78739	9.89771	9.88968	0.11032	28
73	37 51 22.5	9.78794	9.89738	9.89056	0.10944	27
74	37 54 45.0	9.78849	9.89705	9.89144	0.10856	26
75	37 58 07.5	9.78904	9.89672	9.89232	0.10768	25
76	38 01 30.0	9.78958	9.89638	9.89320	0.10680	24
77	38 04 52.5	9.79013	9.89605	9.89408	0.10592	23
78	38 08 15.0	9.79067	9.89572	9.89496	0.10504	22
79	38 11 37.5	9.79122	9.89538	9.89583	0.10417	21
80	38 15 00.0	9.79176	9.89504	9.89671	0.10329	20
81	38 18 22.5	9.79230	9.89471	9.89759	0.10241	19
82	38 21 45.0	9.79284	9.89437	9.89846	0.10154	18
83	38 25 07.5	9.79337	9.89403	9.89934	0.10066	17
84	38 28 30.0	9.79391	9.89370	9.90022	0.09978	16
85	38 31 52.5	9.79445	9.89336	9.90109	0.09891	15
86	38 35 15.0	9.79498	9.89302	9.90197	0.09803	14
87	38 38 37.5	9.79552	9.89268	9.90284	0.09716	13
88	38 42 00.0	9.79605	9.89233	9.90371	0.09629	12
89	38 45 22.5	9.79658	9.89199	9.90459	0.09541	11
90	38 48 45.0	9.79711	9.89165	9.90546	0.09454	10
91	38 52 07.5	9.79764	9.89131	9.90633	0.09367	09
92	38 55 30.0	9.79817	9.89096	9.90721	0.09279	08
93	38 58 52.5	9.79870	9.89062	9.90808	0.09192	07
94	39 02 15.0	9.79922	9.89027	9.90895	0.09105	06
95	39 05 37.5	9.79975	9.88993	9.90982	0.09018	05
96	39 09 00.0	9.80027	9.88958	9.91069	0.08931	04
97	39 12 22.5	9.80080	9.88923	9.91156	0.08844	03
98	39 15 45.0	9.80132	9.88888	9.91243	0.08757	02
99	39 19 07.5	9.80184	9.88853	9.91330	0.08670	01
100	39 22 30.0	9.80205	9.88839	9.91417	0.08583	00
Mils	° ′ ″	cos	sin	cot	tan	9—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

7—	° ′ ″	sin	cos	tan	cot	Mils
00	39 22 30.0	9.80236	9.88818	9.91417	0.08583	100
01	39 25 52.5	9.80288	9.88784	9.91504	0.08496	99
02	39 29 15.0	9.80340	9.88748	9.91591	0.08409	98
03	39 32 37.5	9.80391	9.88713	9.91678	0.08322	97
04	39 36 00.0	9.80443	9.88678	9.91765	0.08235	96
05	39 39 22.5	9.80494	9.88643	9.91852	0.08148	95
06	39 42 45.0	9.80546	9.88607	9.91938	0.08062	94
07	39 46 07.5	9.80597	9.88572	9.92025	0.07975	93
08	39 49 30.0	9.80648	9.88536	9.92112	0.07888	92
09	39 52 52.5	9.80699	9.88501	9.92198	0.07802	91
10	39 56 15.0	9.80750	9.88465	9.92285	0.07715	90
11	39 59 37.5	9.80801	9.88429	9.92372	0.07628	89
12	40 03 00.0	9.80852	9.88394	9.92458	0.07542	88
13	40 06 22.5	9.80903	9.88358	9.92545	0.07455	87
14	40 09 45.0	9.80953	9.88322	9.92631	0.07369	86
15	40 13 07.5	9.81004	9.88286	9.92718	0.07282	85
16	40 16 30.0	9.81054	9.88250	9.92804	0.07196	84
17	40 19 52.5	9.81104	9.88213	9.92891	0.07109	83
18	40 23 15.0	9.81154	9.88177	9.92977	0.07023	82
19	40 26 37.5	9.81204	9.88141	9.93064	0.06936	81
20	40 30 00.0	9.81254	9.88105	9.93150	0.06850	80
21	40 33 22.5	9.81304	9.88068	9.93236	0.06764	79
22	40 36 45.0	9.81354	9.88032	9.93323	0.06677	78
23	40 40 07.5	9.81404	9.87995	9.93409	0.06591	77
24	40 43 30.0	9.81453	9.87958	9.93495	0.06505	76
25	40 46 52.5	9.81503	9.87922	9.93581	0.06419	75
26	40 50 15.0	9.81552	9.87885	9.93667	0.06333	74
27	40 53 37.5	9.81601	9.87848	9.93754	0.06246	73
28	40 57 00.0	9.81651	9.87811	9.93840	0.06160	72
29	41 00 22.5	9.81700	9.87774	9.93926	0.06074	71
30	41 03 45.0	9.81749	9.87737	9.94012	0.05988	70
31	41 07 07.5	9.81798	9.87700	9.94098	0.05902	69
32	41 10 30.0	9.81846	9.87662	9.94184	0.05816	68
33	41 13 52.5	9.81895	9.87625	9.94270	0.05730	67
34	41 17 15.0	9.81944	9.87588	9.94356	0.05644	66
35	41 20 37.5	9.81992	9.87550	9.94442	0.05558	65
36	41 24 00.0	9.82041	9.87513	9.94528	0.05472	64
37	41 27 22.5	9.82089	9.87475	9.94614	0.05386	63
38	41 30 45.0	9.82137	9.87437	9.94700	0.05300	62
39	41 34 07.5	9.82185	9.87399	9.94786	0.05214	61
40	41 37 30.0	9.82233	9.87362	9.94872	0.05128	60
41	41 40 52.5	9.82281	9.87324	9.94957	0.05043	59
42	41 44 15.0	9.82329	9.87286	9.95043	0.04957	58
43	41 47 37.5	9.82377	9.87248	9.95129	0.04871	57
44	41 51 00.0	9.82424	9.87209	9.95215	0.04785	56
45	41 54 22.5	9.82472	9.87171	9.95301	0.04699	55
46	41 57 45.0	9.82520	9.87133	9.95387	0.04613	54
47	42 01 07.5	9.82567	9.87095	9.95472	0.04528	53
48	42 04 30.0	9.82614	9.87056	9.95558	0.04442	52
49	42 07 52.5	9.82661	9.87018	9.95644	0.04356	51
50	42 11 15.0	9.82708	9.86979	9.95729	0.04271	50
Mils	° ′ ″	cos	sin	cot	tan	8—

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TABLE LIII.—*Common logarithms of functions of angles in mils*—Continued

7–	° ′ ″	sin	cos	tan	cot	Mils
50	42 11 15.0	9.82708	9.86979	9.95729	0.04271	50
51	42 14 37.5	9.82755	9.86940	9.95815	0.04185	49
52	42 18 00.0	9.82802	9.86902	9.95901	0.04099	48
53	42 21 22.5	9.82849	9.86863	9.95986	0.04014	47
54	42 24 45.0	9.82896	9.86824	9.96072	0.03928	46
55	42 28 07.5	9.82942	9.86785	9.96158	0.03842	45
56	42 31 30.0	9.82989	9.86746	9.96242	0.03757	44
57	42 34 52.5	9.83035	9.86707	9.96329	0.03671	43
58	42 38 15.0	9.83082	9.86667	9.96414	0.03586	42
59	42 41 37.5	9.83128	9.86628	9.96500	0.03500	41
60	42 45 00.0	9.83174	9.86589	9.96586	0.03414	40
61	42 48 22.5	9.83220	9.86549	9.96671	0.03329	39
62	42 51 45.0	9.83266	9.86510	9.96757	0.03243	38
63	42 55 07.5	9.83312	9.86470	9.96842	0.03158	37
64	42 58 30.0	9.83358	9.86430	9.96928	0.03072	36
65	43 01 52.5	9.83404	9.86391	9.97013	0.02987	35
66	43 05 15.0	9.83449	9.86351	9.97099	0.02901	34
67	43 08 37.5	9.83495	9.86311	9.97184	0.02816	33
68	43 12 00.0	9.83540	9.86271	9.97269	0.02731	32
69	43 15 22.5	9.83586	9.86231	9.97355	0.02645	31
70	43 18 45.0	9.83631	9.86191	9.97440	0.02560	30
71	43 22 07.5	9.83676	9.86150	9.97526	0.02474	29
72	43 25 30.0	9.83721	9.86110	9.97611	0.02389	28
73	43 28 52.5	9.83766	9.86070	9.97697	0.02303	27
74	43 32 15.0	9.83811	9.86029	9.97782	0.02218	26
75	43 35 37.5	9.83856	9.85989	9.97867	0.02133	25
76	43 39 00.0	9.83901	9.85948	9.97953	0.02047	24
77	43 42 22.5	9.83945	9.85907	9.98038	0.01962	23
78	43 45 45.0	9.83990	9.85867	9.98123	0.01877	22
79	43 49 07.5	9.84034	9.85826	9.98209	0.01791	21
80	43 52 30.0	9.84079	9.85785	9.98294	0.01706	20
81	43 55 52.5	9.84123	9.85744	9.98379	0.01621	19
82	43 59 15.0	9.84167	9.85703	9.98465	0.01535	18
83	44 02 37.5	9.84211	9.85649	9.98550	0.01450	17
84	44 06 00.0	9.84255	9.85620	9.98635	0.01365	16
85	44 09 22.5	9.84299	9.85579	9.98721	0.01279	15
86	44 12 45.0	9.84343	9.85537	9.98806	0.01194	14
87	44 16 07.5	9.84387	9.85496	9.98891	0.01109	13
88	44 19 30.0	9.84431	9.85454	9.98977	0.01023	12
89	44 22 52.5	9.84474	9.85412	9.99062	0.00938	11
90	44 26 15.0	9.84518	9.85371	9.99147	0.00853	10
91	44 29 37.5	9.84561	9.85329	9.99232	0.00768	09
92	44 33 00.0	9.84605	9.85287	9.99318	0.00682	08
93	44 36 22.5	9.84648	9.85245	9.99403	0.00597	07
94	44 39 45.0	9.84691	9.85203	9.99488	0.00512	06
95	44 43 07.5	9.84734	9.85161	9.99574	0.00426	05
96	44 46 30.0	9.84777	9.85118	9.99659	0.00341	04
97	44 49 52.5	9.84820	9.85076	9.99744	0.00256	03
98	44 53 15.0	9.84863	9.85034	9.99829	0.00171	02
99	44 56 37.5	9.84906	9.84991	9.99915	0.00085	01
100	45 00 00.0	9.84949	9.84949	0.00000	0.00000	00
Mils	° ′ ″	cos	sin	cot	tan	8–

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TABLE LIV

NATURAL SINES AND COSINES OF ANGLES IN MILS

Mils	Sin 000	Cos	Sin 100	Cos	Sin 200	Cos	Sin 300	Cos	Mils
0	.00000	1.	.09802	.99519	.19509	.98079	.29028	.95694	100
1	00098	1.	09899	99509	19605	98059	29122	95665	99
2	00196	1.	09997	99499	19702	98040	29216	95637	98
3	00295	1.	10095	99489	19798	98021	29310	95608	97
4	00393	.99999	10192	99479	19894	98001	29404	95579	96
5	00491	99999	10290	99469	19990	97982	29498	95550	95
6	00589	99998	10388	99459	20086	97962	29592	95521	94
7	00687	99998	10485	99449	20183	97942	29685	95492	93
8	00785	99997	10583	99438	20279	97922	29779	95463	92
9	00884	99996	10681	99428	20375	97902	29873	95434	91
10	00982	99995	10778	99417	20471	97882	29967	95404	90
11	01080	99994	10876	99407	20567	97862	30060	95375	89
12	01178	99993	10973	99396	20663	97842	30154	95345	88
13	01276	99992	11071	99385	20759	97822	30247	95316	87
14	01374	99991	11169	99374	20855	97801	30341	95286	86
15	01473	99989	11266	99363	20951	97781	30434	95256	85
16	01571	99988	11364	99352	21047	97760	30528	95226	84
17	01669	99986	11461	99341	21143	97739	30621	95196	83
18	01767	99984	11559	99330	21239	97718	30715	95166	82
19	01865	99983	11656	99318	21335	97698	30808	95136	81
20	01963	99981	11754	99307	21431	97677	30902	95106	80
21	02062	99979	11851	99295	21527	97656	30995	95075	79
22	02160	99977	11949	99284	21623	97634	31088	95045	78
23	02258	99975	12046	99272	21719	97613	31182	95014	77
24	02356	99972	12144	99260	21814	97592	31275	94984	76
25	02454	99970	12241	99248	21910	97570	31368	94953	75
26	02552	99967	12338	99236	22006	97549	31461	94922	74
27	02650	99965	12435	99224	22102	97527	31555	94891	73
28	02749	99962	12533	99211	22197	97505	31648	94860	72
29	02847	99959	12631	99199	22293	97483	31741	94829	71
30	02945	99957	12728	99187	22389	97461	31834	94798	70
31	03043	99954	12825	99174	22484	97439	31927	94766	69
32	03141	99951	12923	99161	22580	97417	32020	94735	68
33	03239	99948	13020	99149	22676	97395	32113	94704	67
34	03337	99944	13118	99136	22771	97373	32206	94672	66
35	03435	99941	13215	99123	22867	97350	32299	94640	65
36	03534	99938	13312	99110	22963	97328	32392	94609	64
37	03632	99934	13409	99097	23058	97305	32485	94577	63
38	03730	99930	13507	99084	23154	97283	32577	94545	62
39	03828	99927	13604	99070	23259	97260	32670	94513	61
40	03926	99923	13701	99057	23345	97237	32763	94481	60
41	04024	99919	13798	99043	23440	97214	32856	94448	59
42	04122	99915	13896	99030	23535	97191	32948	94416	58
43	04220	99911	13993	99016	23631	97168	33041	94384	57
44	04318	99907	14090	99002	23726	97145	33134	94351	56
45	04416	99902	14187	98988	23822	97121	33226	94319	55
46	04515	99898	14284	98975	23917	97098	33319	94286	54
47	04613	99894	14382	98960	24012	97074	33412	94253	53
48	04711	99889	14479	98946	24108	97051	33504	94220	52
49	04809	99884	14576	98932	24203	97027	33597	94187	51
50	04907	99880	14673	98918	24298	97003	33689	94154	50
Mils	Cos 1500	Sin	Cos 1400	Sin	Cos 1300	Sin	Cos 1200	Sin	Mils

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TABLE LIV.—*Natural sines and cosines of angles in mils*—Continued

Mils	Sin 000 Cos	Sin 100 Cos	Sin 200 Cos	Sin 300 Cos	Mils
50	.04907 .99880	.14673 .98918	.24298 .97003	.33689 .94154	50
51	05005 99875	14770 98903	24393 96979	33781 94121	49
52	05103 99870	14867 98889	24488 96955	33874 94098	48
53	05201 99865	14964 98874	24584 96931	33966 94055	47
54	05299 99860	15061 98859	24679 96907	34058 94021	46
55	05397 99854	15158 98844	24774 96883	34151 93988	45
56	05495 99849	15255 98830	24869 96858	34243 93954	44
57	05593 99843	15352 98814	24964 96834	34335 93921	43
58	05691 99838	15449 98799	25059 96809	34427 93887	42
59	05789 99832	15546 98784	25154 96785	34520 93853	41
60	05887 99827	15643 98769	25249 96760	34612 93819	40
61	05985 99821	15740 98753	25344 96735	34704 93785	39
62	06083 99815	15837 98738	25439 96710	34796 93751	38
63	06181 99809	15934 98722	25534 96685	34888 93717	37
64	06279 99803	16031 98707	25629 96660	34980 93682	36
65	06377 99796	16128 98691	25724 96635	35072 93648	35
66	06475 99790	16225 98675	25819 96610	35164 93613	34
67	06573 99784	16322 98659	25914 96584	35256 93579	33
68	06671 99777	16419 98643	26008 96559	35347 93544	32
69	06769 99771	16516 98627	26103 96533	35439 93510	31
70	06867 99764	16612 98610	26198 96507	35531 93475	30
71	06965 99757	16709 98594	26293 96482	35623 93440	29
72	07063 99750	16806 98578	26387 96456	35715 93405	28
73	07161 99743	16903 98561	26482 96430	35806 93370	27
74	07259 99736	16999 98545	26577 96404	35898 93335	26
75	07356 99729	17096 98528	26671 96378	35990 93299	25
76	07454 99722	17193 98511	26766 96351	36081 93264	24
77	07552 99714	17290 98494	26860 96325	36173 93228	23
78	07650 99707	17386 98477	26955 96299	36264 93193	22
79	07748 99699	17483 98460	27050 96272	36356 93157	21
80	07846 99692	17580 98443	27144 96246	36447 93121	20
81	07944 99684	17676 98425	27239 96219	36538 93086	19
82	08042 99676	17773 98408	27333 96192	36630 93050	18
83	08139 99668	17869 98390	27427 96165	36721 93014	17
84	08237 99660	17966 98373	27522 96138	36812 92978	16
85	08335 99652	18063 98355	27616 96111	36904 92941	15
86	08433 99644	18159 98337	27711 96084	36995 92905	14
87	08531 99635	18256 98320	27805 96057	37086 92869	13
88	08629 99627	18352 98302	27899 96029	37177 92832	12
89	08726 99619	18449 98283	27993 96002	37268 92796	11
90	08824 99610	18545 98265	28088 95974	37359 92759	10
91	08922 99601	18642 98247	28182 95947	37451 92722	9
92	09020 99592	18738 98229	28276 95919	37542 92686	8
93	09118 99583	18835 98210	28370 95891	37633 92649	7
94	09215 99574	18931 98192	28464 95863	37723 92612	6
95	09313 99565	19027 98173	28558 95835	37814 92575	5
96	09411 99556	19124 98154	28652 95807	37905 92538	4
97	09509 99547	19220 98136	28746 95779	37996 92500	3
98	09606 99538	19316 98117	28840 95751	38087 92463	2
99	09704 99528	19413 98098	28934 95722	38178 92425	1
100	09802 99519	19509 98079	29028 95694	38268 92388	0
Mils	Cos 1500 Sin	Cos 1400 Sin	Cos 1300 Sin	Cos 1200 Sin	Mils

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TABLE LIV.—*Natural sines and cosines of angles in mils*—Continued

Mils	Sin 400 Cos	Sin 500 Cos	Sin 600 Cos	Sin 700 Cos	Mils
0	.38268 .92388	.47140 .88192	.55557 .83147	.63439 .77301	100
1	38359 92350	47226 88146	55639 83092	63515 77239	99
2	38450 92313	47313 88099	55720 83038	63591 77176	98
3	38540 92275	47399 88053	55802 82983	63667 77114	97
4	38631 92237	47486 88006	55883 82928	63742 77051	96
5	38721 92199	47572 87960	55964 82873	63818 76989	95
6	38812 92161	47658 87913	56046 82818	63893 76926	94
7	38902 92123	47745 87866	56127 82763	63969 76863	93
8	38993 92085	47831 87819	56208 82708	64044 76800	92
9	39083 92046	47917 87772	56290 82653	64120 76737	91
10	39174 92008	48003 87725	56371 82598	64195 76674	90
11	39264 91969	48089 87678	56452 82542	64270 76611	89
12	39354 91931	48175 87631	56533 82487	64346 76548	88
13	39444 91892	48261 87583	56614 82431	64421 76485	87
14	39535 91853	48347 87536	56695 82376	64496 76422	86
15	39625 91814	48433 87488	56775 82320	64571 76358	85
16	39715 91775	48519 87441	56856 82264	64646 76295	84
17	39805 91736	48605 87393	56937 82208	64721 76232	83
18	39895 91697	48691 87345	57018 82152	64795 76168	82
19	39985 91658	48776 87298	57098 82096	64870 76104	81
20	40075 91619	48862 87250	57179 82040	64945 76041	80
21	40165 91579	48948 87202	57259 81984	65019 75977	79
22	40255 91540	49033 87153	57340 81928	65094 75913	78
23	40345 91500	49119 87105	57420 81871	65168 75849	77
24	40434 91461	49204 87057	57501 81815	65243 75785	76
25	40524 91421	49290 87009	57581 81759	65317 75721	75
26	40614 91381	49375 86960	57661 81702	65392 75657	74
27	40704 91341	49461 86912	57741 81645	65466 75592	73
28	40793 91301	49546 86863	57821 81589	65540 75528	72
29	40883 91261	49631 86814	57901 81532	65614 75464	71
30	40972 91221	49716 86766	57981 81475	65688 75399	70
31	41062 91181	49802 86717	58061 81418	65762 75335	69
32	41151 91140	49887 86668	58141 81361	65836 75270	68
33	41241 91100	49972 86619	58221 81304	65910 75206	67
34	41330 91059	50057 86570	58301 81247	65984 75141	66
35	41420 91019	50142 86521	58381 81189	66058 75076	65
36	41509 90978	50227 86471	58460 81132	66131 75011	64
37	41598 90937	50311 86422	58540 81074	66205 74946	63
38	41688 90896	50396 86372	58620 81017	66278 74881	62
39	41777 90855	50481 86323	58699 80959	66352 74816	61
40	41866 90814	50566 86273	58779 80902	66425 74751	60
41	41955 90773	50650 86224	58858 80844	66499 74686	59
42	42044 90732	50735 86174	58937 80786	66572 74620	58
43	42133 90691	50820 86124	59017 80728	66645 74555	57
44	42222 90649	50904 86074	59096 80670	66718 74489	56
45	42311 90608	50989 86024	59175 80612	66791 74424	55
46	42400 90566	51073 85974	59254 80554	66864 74358	54
47	42489 90524	51157 85924	59343 80496	66937 74293	53
48	42578 90483	51242 85874	59412 80438	67010 74227	52
49	42667 90441	51326 85823	59491 80379	67083 74161	51
50	42756 90399	51410 85773	59570 80321	67156 74095	50
Mils	Cos 1100 Sin	Cos 1000 Sin	Cos 900 Sin	Cos 800 Sin	Mils

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TABLE LIV.—*Natural sines and cosines of angles in mils*—Continued

Mils	Sin 400	Cos	Sin 500	Cos	Sin 600	Cos	Sin 700	Cos	Mils
50	.42756	.90399	.51410	.85773	.59570	.80321	.67156	.74095	50
51	42844	90357	51494	85722	59649	80262	67229	74029	49
52	42933	90315	51579	85672	59728	80204	67301	73963	48
53	43022	90273	51663	85621	59806	80145	67374	73897	47
54	43110	90230	51747	85570	59885	80086	67446	73831	46
55	43199	90188	51831	85519	59963	80027	67519	73765	45
56	43287	90146	51915	85469	60042	79968	67591	73698	44
57	43376	90103	51999	85418	60121	79909	67664	73632	43
58	43464	90060	52082	85366	60199	79850	67736	73565	42
59	43553	90018	52166	85315	60277	79791	67808	73499	41
60	43641	89975	52250	85264	60356	79732	67880	73432	40
61	43729	89932	52334	85213	60434	79673	67952	73366	39
62	43818	89889	52417	85161	60512	79613	68024	73299	38
63	43906	89846	52501	85110	60590	79554	68096	73232	37
64	43994	89803	52584	85058	60668	79494	68168	73165	36
65	44082	89760	52668	85007	60746	79435	68240	73098	35
66	44170	89716	52751	84955	60824	79375	68311	73031	34
67	44258	89673	52835	84903	60902	79315	68383	72964	33
68	44346	89629	52918	84851	60980	79256	68455	72897	32
69	44434	89586	53001	84799	61058	79196	68526	72829	31
70	44522	89542	53084	84747	61135	79136	68598	72762	30
71	44610	89498	53168	84695	61213	79076	68669	72695	29
72	44698	89454	53251	84643	61291	79016	68740	72627	28
73	44786	89410	53334	84590	61368	78955	68812	72560	27
74	44873	89366	53417	84538	61446	78895	68883	72492	26
75	44961	89322	53500	84485	61523	78835	68954	72425	25
76	45049	89278	53583	84433	61601	78774	69025	72357	24
77	45136	89234	53666	84380	61678	78714	69096	72289	23
78	45224	89190	53748	84327	61755	78653	69167	72221	22
79	45312	89145	53831	84275	61832	78592	69238	72153	21
80	45399	89101	53914	84222	61909	78532	69309	72085	20
81	45487	89056	53996	84169	61986	78471	69379	72017	19
82	45574	89011	54079	84116	62063	78410	69450	71949	18
83	45661	88967	54162	84063	62140	78349	69521	71881	17
84	45749	88922	54244	84009	62217	78288	69591	71813	16
85	45836	88877	54327	83956	62294	78227	69662	71744	15
86	45923	88832	54409	83903	62371	78166	69732	71676	14
87	46010	88787	54491	83849	62448	78104	69802	71607	13
88	46097	88741	54574	83796	62524	78043	69873	71539	12
89	46184	88696	54656	83742	62601	77982	69943	71470	11
90	46271	88651	54738	83688	62677	77920	70013	71401	10
91	46358	88605	54820	83635	62754	77859	70083	71333	9
92	46445	88560	54902	83581	62830	77797	70153	71264	8
93	46532	88514	54984	83527	62907	77735	70223	71195	7
94	46619	88468	55066	83473	62983	77673	70293	71126	6
95	46706	88422	55148	83419	63059	77612	70363	71057	5
96	46793	88377	55230	83364	63135	77550	70432	70988	4
97	46880	88331	55312	83310	63211	77488	70502	70919	3
98	46966	88285	55394	83256	63287	77425	70572	70849	2
99	47053	88238	55475	83201	63363	77363	70641	70780	1
100	47140	88192	55557	83147	63439	77301	70711	70711	0
Mils	Cos 1100	Sin	Cos 1000	Sin	Cos 900	Sin	Cos 800	Sin	Mils

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TABLE LV

NATURAL TANGENTS AND COTANGENTS OF ANGLES IN MILS

Tan	000	100	200	300	400	500	600	700	Mils
0	.00000	.09849	19891	.30335	.41421	.53451	.66818	.82068	100
1	00098	09948	19993	30442	41536	53577	66960	82232	99
2	00196	10047	20095	30549	41652	53704	67102	82397	98
3	00295	10147	20198	30657	41767	53830	67245	82562	97
4	00393	10246	20300	30764	41882	53957	67387	82727	96
5	00491	10345	20402	30872	41998	54084	67530	82893	95
6	00589	10444	20504	30979	42113	54211	67673	83058	94
7	00687	10544	20607	31087	42229	54338	67817	83224	93
8	00785	10643	20709	31194	42345	54465	67960	83391	92
9	00884	10742	20811	31302	42460	54593	68104	83557	91
10	00982	10841	20914	31410	42576	54720	68247	83724	90
11	01080	10941	21016	31518	42692	54848	68391	83891	89
12	01178	11040	21119	31626	42808	54975	68535	84059	88
13	01276	11139	21221	31734	42925	55103	68680	84226	87
14	01375	11239	21324	31842	43041	55231	68825	84394	86
15	01473	11338	21426	31950	43157	55360	68969	84563	85
16	01571	11438	21529	32058	43274	55488	69114	84731	84
17	01669	11537	21632	32167	43390	55616	69259	84900	83
18	01767	11637	21735	32275	43507	55745	69405	85069	82
19	01866	11736	21838	32383	43624	55874	69550	85238	81
20	01964	11836	21941	32492	43741	56003	69696	85408	80
21	02062	11935	22044	32601	43858	56132	69842	85578	79
22	02160	12035	22147	32709	43975	56261	69988	85748	78
23	02258	12135	22250	32818	44092	56390	70135	85919	77
24	02357	12234	22353	32927	44210	56520	70281	86090	76
25	02455	12334	22456	33036	44327	56649	70428	86261	75
26	02553	12434	22559	33144	44445	56779	70575	86432	74
27	02651	12533	22662	33253	44562	56909	70722	86604	73
28	02750	12663	22765	33363	44680	57039	70869	86776	72
29	02848	12733	22869	33472	44798	57169	71017	86948	71
30	02946	12832	22972	33581	44916	57300	71165	87120	70
31	03044	12932	23075	33690	45034	57430	71313	87293	69
32	03143	13032	23179	33800	45152	57561	71461	87466	68
33	03241	13132	23282	33909	45270	57692	71609	87640	67
34	03339	13232	23386	34019	45388	57823	71758	87814	66
35	03437	13332	23489	34129	45507	57954	71907	87988	65
36	03536	13432	23593	34238	45625	58085	72056	88162	64
37	03634	13532	23697	34347	45744	58216	72205	88336	63
38	03732	13632	23800	34457	45863	58348	72355	88511	62
39	03831	13732	23904	34567	45982	58479	72504	88687	61
40	03929	13832	24008	34677	46101	58611	72654	88862	60
41	04027	13932	24112	34787	46220	58743	72804	89038	59
42	04126	14032	24216	34897	46339	58875	72955	89214	58
43	04224	14132	24320	35007	46458	59007	73105	89391	57
44	04322	14232	24424	35118	46578	59140	73256	89567	56
45	04421	14332	24528	35228	46697	59272	73407	89745	55
46	04519	14432	24632	35338	46817	59405	73558	89922	54
47	04617	14532	24736	35449	46937	59538	73710	90100	53
48	04716	14633	24840	35559	47056	59671	73861	90278	52
49	04814	14733	24944	35670	47176	59804	74013	90456	51
50	04913	14833	25049	35781	47296	59938	74165	90635	50
Mils	1500	1400	1300	1200	1100	1000	900	800	Cot

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TABLE LV.—*Natural tangents and cotangents of angles in mils*—Continued

Tan	000	100	200	300	400	500	600	700	Mils
50	.04913	.14833	.25049	.35781	.47296	.59938	.74165	.90635	50
51	05011	14934	25153	35891	47417	60071	74317	90814	49
52	05110	15034	25257	36002	47537	60205	74470	90993	48
53	05208	15135	25362	36113	47657	60339	74623	91173	47
54	05306	15235	25466	36224	47778	60473	74776	91353	46
55	05405	15336	25571	36335	47899	60607	74929	91533	45
56	05503	15436	25676	36446	48019	60741	75082	91713	44
57	05602	15537	25780	36558	48140	60876	75236	91894	43
58	05700	15637	25885	36669	48261	61010	75390	92076	42
59	05799	15738	25990	36780	48382	61145	75544	92257	41
60	05897	15838	26095	36892	48503	61280	75698	92439	40
61	05996	15939	26200	37004	48625	61415	75853	92621	39
62	06094	16040	26305	37115	48746	61551	76007	92804	38
63	06193	16141	26410	37227	48868	61686	76162	92987	37
64	06291	16241	26515	37339	48989	61822	76318	93170	36
65	06390	16342	26620	37451	49111	61957	76473	93354	35
66	06489	16443	26725	37563	49233	62093	76629	93537	34
67	06587	16544	26830	37675	49355	62229	76785	93722	33
68	06686	16645	26935	37787	49477	62366	76941	93906	32
69	06784	16745	27041	37899	49600	62502	77097	94091	31
70	06883	16846	27146	38011	49722	62639	77254	94276	30
71	06982	16947	27251	38124	49845	62775	77411	94462	29
72	07080	17048	27357	38236	49967	62912	77568	94648	28
73	07179	17149	27462	38349	50090	63050	77725	94834	27
74	07278	17251	27568	38462	50213	63187	77883	95021	26
75	07376	17352	27674	38574	50336	63324	78041	95208	25
76	07475	17453	27779	38687	50459	63462	78199	95395	24
77	07574	17554	27885	38800	50582	63600	78357	95583	23
78	07673	17655	27991	38913	50706	63738	78516	95771	22
79	07771	17756	28097	39026	50829	63876	78675	95959	21
80	07870	17858	28203	39139	50953	64014	78834	96148	20
81	07969	17959	28309	39253	51076	64153	78993	96337	19
82	08068	18060	28415	39366	51200	64291	79153	96527	18
83	08167	18162	28521	39479	51324	64430	79312	96717	17
84	08265	18263	28627	39593	51448	64569	79472	96907	16
85	08364	18365	28734	39707	51572	64708	79633	97097	15
86	08463	18466	28840	39821	51697	64848	79793	97288	14
87	08562	18568	28946	39934	51821	64987	79954	97479	13
88	08661	18669	29053	40048	51946	65127	80115	97671	12
89	08760	18771	29159	40162	52071	65267	80276	97863	11
90	08859	18873	29266	40276	52196	65407	80438	98056	10
91	08958	18974	29372	40390	52321	65547	80600	98248	9
92	09057	19076	29479	40504	52446	65688	80762	98441	8
93	09156	19178	29586	40618	52571	65828	80924	98635	7
94	09255	19280	29693	40733	52696	65969	81087	98829	6
95	09354	19381	29799	40847	52822	66110	81250	99023	5
96	09453	19483	29906	40962	52947	66251	81413	99218	4
97	09552	19585	30013	41077	53073	66393	81576	99413	3
98	09651	19687	30120	41192	53199	66534	81740	99608	2
99	09750	19789	30227	41306	53325	66676	81904	99804	1
100	09849	19891	30335	41421	53451	66818	82068	1.	0
Mils	1500	1400	1300	1200	1100	1000	900	800	Cot

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TABLE LV.—*Natural tangents and cotangents of angles in mils*—Continued

Tan	800	900	1000	1100	1200	1300	1400	1500	Mils
0	1.00000	1.21850	1.49661	1.87087	2.41421	3.29661	5.02734	10.15318	100
1	1.00197	1.22094	1.49980	1.87529	2.42095	3.30830	5.05320	10.25638	99
2	1.00395	1.22339	1.50299	1.87973	2.42770	3.32006	5.07933	10.36172	98
3	1.00592	1.22585	1.50619	1.88419	2.43447	3.33188	5.10573	10.46916	97
4	1.00789	1.22831	1.50941	1.88867	2.44128	3.34377	5.13242	10.57890	96
5	1.00987	1.23077	1.51263	1.89316	2.44813	3.35574	5.15941	10.69090	95
6	1.01186	1.23324	1.51586	1.89767	2.45502	3.36780	5.18670	10.80530	94
7	1.01384	1.23572	1.51910	1.90219	2.46194	3.37994	5.21429	10.92215	93
8	1.01583	1.23820	1.52235	1.90673	2.46888	3.39217	5.24218	11.04152	92
9	1.01783	1.24069	1.52562	1.91129	2.47586	3.40449	5.27035	11.16352	91
10	1.01983	1.24319	1.52889	1.91587	2.48287	3.41690	5.29880	11.28822	90
11	1.02183	1.24569	1.53217	1.92047	2.48992	3.42941	5.32753	11.41568	89
12	1.02384	1.24820	1.53546	1.92508	2.49700	3.44202	5.35654	11.54609	88
13	1.02586	1.25072	1.53876	1.92969	2.50412	3.45470	5.38584	11.67947	87
14	1.02787	1.25324	1.54207	1.93433	2.51127	3.46746	5.41543	11.81594	86
15	1.02990	1.25576	1.54540	1.93899	2.51847	3.48030	5.44531	11.95559	85
16	1.03192	1.25830	1.54873	1.94368	2.52571	3.49322	5.47548	12.09859	84
17	1.03395	1.26084	1.55208	1.94839	2.53299	3.50622	5.50596	12.24501	83
18	1.03599	1.26338	1.55543	1.95312	2.54030	3.51930	5.53678	12.39501	82
19	1.03803	1.26593	1.55879	1.95786	2.54764	3.53247	5.56797	12.54868	81
20	1.04006	1.26849	1.56216	1.96261	2.55500	3.54573	5.59954	12.70621	80
21	1.04210	1.27105	1.56553	1.96737	2.56240	3.55908	5.63149	12.86767	79
22	1.04415	1.27363	1.56892	1.97216	2.56984	3.57253	5.66384	13.03333	78
23	1.04621	1.27621	1.57233	1.97697	2.57732	3.58608	5.69659	13.20326	77
24	1.04827	1.27879	1.57575	1.98180	2.58484	3.59973	5.72974	13.37765	76
25	1.05033	1.28138	1.57918	1.98665	2.59240	3.61348	5.76324	13.55664	75
26	1.05239	1.28398	1.58261	1.99152	2.59999	3.62733	5.79710	13.74052	74
27	1.05446	1.28658	1.58605	1.99641	2.60763	3.64130	5.83132	13.92945	73
28	1.05654	1.28919	1.58951	2.00131	2.61531	3.65538	5.86591	14.12354	72
29	1.05863	1.29181	1.59298	2.00624	2.62304	3.66955	5.90086	14.32310	71
30	1.06072	1.29443	1.59646	2.01119	2.63080	3.68381	5.93617	14.52839	70
31	1.06282	1.29706	1.59995	2.01615	2.63859	3.69817	5.97184	14.73961	69
32	1.06492	1.29970	1.60345	2.02113	2.64642	3.71263	6.00797	14.95703	68
33	1.06701	1.30234	1.60697	2.02613	2.65428	3.72720	6.04449	15.18092	67
34	1.06910	1.30499	1.61049	2.03116	2.66219	3.74187	6.08150	15.41160	66
35	1.07120	1.30765	1.61402	2.03620	2.67014	3.75664	6.11900	15.64937	65
36	1.07331	1.31031	1.61755	2.04125	2.67814	3.77152	6.15699	15.89455	64
37	1.07542	1.31299	1.62110	2.04634	2.68620	3.78650	6.19546	16.14749	63
38	1.07754	1.31567	1.62467	2.05145	2.69431	3.80160	6.23441	16.40860	62
39	1.07966	1.31835	1.62826	2.05658	2.70245	3.81682	6.27384	16.67828	61
40	1.08179	1.32104	1.63185	2.06173	2.71062	3.83216	6.31375	16.95689	60
41	1.08392	1.32373	1.63546	2.06689	2.71884	3.84762	6.35416	17.24491	59
42	1.08605	1.32644	1.63907	2.07207	2.72710	3.86320	6.39507	17.54294	58
43	1.08819	1.32915	1.64269	2.07727	2.73541	3.87891	6.43649	17.85139	57
44	1.09034	1.33187	1.64632	2.08250	2.74376	3.89474	6.47844	18.17081	56
45	1.09250	1.33460	1.64997	2.08774	2.75216	3.91069	6.52091	18.50180	55
46	1.09466	1.33733	1.65363	2.09301	2.76060	3.92676	6.56390	18.84513	54
47	1.09683	1.34007	1.65730	2.09832	2.76908	3.94295	6.60741	19.20136	53
48	1.09899	1.34282	1.66099	2.10364	2.77761	3.95926	6.65144	19.57128	52
49	1.10117	1.34558	1.66469	2.10897	2.78619	3.97569	6.69616	19.95565	51
50	1.10334	1.34835	1.66840	2.11434	2.79481	3.99225	6.74146	20.35545	50
Mils	700	600	500	400	300	200	100	000	Cot

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TABLE LV.—*Natural tangents and cotangents of angles in mils*—Continued

Tan	800	900	1000	1100	1200	1300	1400	1500	Mils
50	1. 10334	1. 34835	1. 66840	2. 11434	2. 79481	3. 99225	6. 74146	20. 35545	50
51	1. 10551	1. 35112	1. 67212	2. 11972	2. 80347	4. 00893	6. 78735	20. 77153	49
52	1. 10769	1. 35389	1. 67585	2. 12511	2. 81218	4. 02574	6. 83388	21. 20495	48
53	1. 10988	1. 35667	1. 67960	2. 13054	2. 82095	4. 04268	6. 88102	21. 65675	47
54	1. 11207	1. 35947	1. 68336	2. 13599	2. 82978	4. 05976	6. 92881	22. 12824	46
55	1. 11427	1. 36227	1. 68713	2. 14146	2. 83866	4. 07698	6. 97726	22. 62068	45
56	1. 11648	1. 36508	1. 69091	2. 14696	2. 84758	4. 09435	7. 02637	23. 13541	44
57	1. 11868	1. 36790	1. 69470	2. 15248	2. 85655	4. 11187	7. 07616	23. 67416	43
58	1. 12089	1. 37072	1. 69851	2. 15802	2. 86557	4. 12953	7. 12666	24. 23843	42
59	1. 12311	1. 37355	1. 70233	2. 16358	2. 87464	4. 14734	7. 17785	24. 83029	41
60	1. 12534	1. 37638	1. 70616	2. 16917	2. 88376	4. 16530	7. 22978	25. 45170	40
61	1. 12757	1. 37922	1. 71001	2. 17478	2. 89293	4. 18340	7. 28244	26. 10525	39
62	1. 12980	1. 38207	1. 71387	2. 18042	2. 90215	4. 20165	7. 33589	26. 79254	38
63	1. 13204	1. 38494	1. 71774	2. 18609	2. 91142	4. 22005	7. 39009	27. 51738	37
64	1. 13428	1. 38781	1. 72163	2. 19178	2. 92076	4. 23860	7. 44509	28. 28243	36
65	1. 13653	1. 39069	1. 72552	2. 19750	2. 93016	4. 25730	7. 50089	29. 09120	35
66	1. 13878	1. 39357	1. 72942	2. 20323	2. 93961	4. 27615	7. 55753	29. 94744	34
67	1. 14104	1. 39646	1. 73334	2. 20898	2. 94911	4. 29515	7. 61501	30. 85557	33
68	1. 14330	1. 39936	1. 73728	2. 21475	2. 95866	4. 31430	7. 67337	31. 82052	32
69	1. 14557	1. 40227	1. 74124	2. 22055	2. 96826	4. 33361	7. 73257	32. 84760	31
70	1. 14784	1. 40519	1. 74521	2. 22638	2. 97791	4. 35309	7. 79273	33. 94323	30
71	1. 15012	1. 40812	1. 74920	2. 23224	2. 98762	4. 37273	7. 85380	35. 11424	29
72	1. 15240	1. 41105	1. 75319	2. 23814	2. 99738	4. 39256	7. 91582	36. 36911	28
73	1. 15469	1. 41399	1. 75719	2. 24406	3. 00720	4. 41257	7. 97881	37. 71678	27
74	1. 15698	1. 41693	1. 76121	2. 25000	3. 01708	4. 43277	8. 04278	39. 16892	26
75	1. 15928	1. 41989	1. 76525	2. 25596	3. 02702	4. 45316	8. 10778	40. 73547	25
76	1. 16158	1. 42286	1. 76930	2. 26196	3. 03703	4. 47374	8. 17383	42. 43346	24
77	1. 16389	1. 42583	1. 77336	2. 26798	3. 04710	4. 49449	8. 24094	44. 27900	23
78	1. 16621	1. 42881	1. 77743	2. 27402	3. 05723	4. 51542	8. 30914	46. 29242	22
79	1. 16853	1. 43180	1. 78152	2. 28009	3. 06742	4. 53653	8. 37849	48. 49745	21
80	1. 17085	1. 43480	1. 78563	2. 28619	3. 07768	4. 55782	8. 44896	50. 92304	20
81	1. 17318	1. 43781	1. 78975	2. 29232	3. 08800	4. 57929	8. 52060	53. 60312	19
82	1. 17551	1. 44082	1. 79388	2. 29848	3. 09838	4. 60094	8. 59348	56. 58253	18
83	1. 17785	1. 44385	1. 79803	2. 30466	3. 10882	4. 62278	8. 66758	59. 91106	17
84	1. 18019	1. 44688	1. 80219	2. 31086	3. 11933	4. 64480	8. 74298	63. 65674	16
85	1. 18254	1. 44992	1. 80637	2. 31710	3. 12990	4. 66702	8. 81970	67. 89943	15
86	1. 18490	1. 45296	1. 81056	2. 32337	3. 14053	4. 68946	8. 89768	72. 75196	14
87	1. 18727	1. 45602	1. 81477	2. 32966	3. 15122	4. 71212	8. 97706	78. 34836	13
88	1. 18964	1. 45910	1. 81899	2. 33599	3. 16197	4. 73500	9. 05789	84. 87871	12
89	1. 19202	1. 46218	1. 82323	2. 34235	3. 17279	4. 75811	9. 14016	92. 59553	11
90	1. 19440	1. 46527	1. 82748	2. 34873	3. 18368	4. 78145	9. 22390	101. 8559	10
91	1. 19679	1. 46836	1. 83174	2. 35514	3. 19464	4. 80502	9. 30917	113. 1723	9
92	1. 19918	1. 47146	1. 83603	2. 36158	3. 20567	4. 82882	9. 39603	127. 3213	8
93	1. 20158	1. 47457	1. 84033	2. 36805	3. 21677	4. 85283	9. 48451	145. 5091	7
94	1. 20398	1. 47769	1. 84464	2. 37455	3. 22795	4. 87707	9. 57465	169. 7633	6
95	1. 20638	1. 48082	1. 84897	2. 38109	3. 23921	4. 90154	9. 66647	203. 7183	5
96	1. 20879	1. 48396	1. 85333	2. 38765	3. 25055	4. 92624	9. 76009	254. 6466	4
97	1. 21121	1. 48711	1. 85769	2. 39423	3. 26196	4. 95117	9. 85551	339. 5239	3
98	1. 21363	1. 49027	1. 86207	2. 40085	3. 27344	4. 97633	9. 95279	509. 2952	2
99	1. 21606	1. 49344	1. 86646	2. 40751	3. 28499	5. 00172	10. 0520	1018. 383	1
100	1. 21850	1. 49661	1. 87087	2. 41421	3. 29661	5. 02734	10. 1532	∞	0
Mils	700	600	500	400	300	200	100	000	Cot

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TABLE LVI

CONVERSION OF DEGREES TO MILS, AND OF MILS TO DEGREES

Conversion of degrees to mils

(Conversion factor—1 degree = 17.77778 mils;
1 minute = 0.29630 mils)

Degrees	Mils	Degrees	Mils	Degrees	Mils	Minutes	Mils	Minutes	Mils
1	17.8	31	551.1	61	1084.4	1	0.3	31	9.2
2	35.6	32	568.9	62	1102.2	2	0.6	32	9.5
3	53.3	33	586.7	63	1120.0	3	0.9	33	9.8
4	71.1	34	604.4	64	1137.8	4	1.2	34	10.1
5	88.9	35	622.2	65	1155.6	5	1.5	35	10.4
6	106.7	36	640.0	66	1173.3	6	1.8	36	10.7
7	124.4	37	657.8	67	1191.1	7	2.1	37	11.0
8	142.2	38	675.6	68	1208.9	8	2.4	38	11.3
9	160.0	39	693.3	69	1226.7	9	2.7	39	11.6
10	177.8	40	711.1	70	1244.5	10	3.0	40	11.9
11	195.6	41	728.9	71	1262.2	11	3.3	41	12.1
12	213.3	42	746.7	72	1280.0	12	3.6	42	12.4
13	231.1	43	764.4	73	1297.8	13	3.9	43	12.7
14	248.9	44	782.2	74	1315.6	14	4.1	44	13.0
15	266.7	45	800.0	75	1333.3	15	4.4	45	13.3
16	284.4	46	817.8	76	1351.1	16	4.7	46	13.6
17	302.2	47	835.6	77	1368.9	17	5.0	47	13.9
18	320.0	48	853.3	78	1386.7	18	5.3	48	14.2
19	337.8	49	871.1	79	1404.5	19	5.6	49	14.5
20	355.6	50	888.9	80	1422.2	20	5.9	50	14.8
21	373.3	51	906.7	81	1440.0	21	6.2	51	15.1
22	391.1	52	924.4	82	1457.8	22	6.5	52	15.4
23	408.9	53	942.2	83	1475.6	23	6.8	53	15.7
24	426.7	54	960.0	84	1493.3	24	7.1	54	16.0
25	444.5	55	977.8	85	1511.1	25	7.4	55	16.3
26	462.2	56	995.6	86	1528.9	26	7.7	56	16.6
27	480.0	57	1013.3	87	1546.7	27	8.0	57	16.9
28	497.8	58	1031.1	88	1564.5	28	8.3	58	17.2
29	515.6	59	1048.9	89	1582.2	29	8.6	59	17.5
30	533.3	60	1066.7	90	1600.0	30	8.9	60	17.8

Examples: 1. Convert 64° 29′ to mils.

64° = 1137. 8 mils
29′ = 8. 6
64° 29′ = 1146. 4 mils.

2. Convert 87.95° to mils.

87° = 1546. 7 mils
.90° = 16. 0
.05° = 0.889 = 0. 9
87.95° = 1563. 6 mils.

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TABLE LVI.—*Conversion of degrees to mils, and of mils to degrees*—Continued

Conversion of mils to degrees and minutes

(Conversion factor—1 mil equals 0.05625 degrees equals 3.37500 minutes)

Mils	00	10	20	30	40
0	00°00′.00	00°33′.75	1°07′.50	1°41′.25	2°15′.00
100	5 37.50	6 11.25	6 45.00	7 18.75	7 52.50
200	11 15.00	11 48.75	12 22.50	12 56.25	13 30.00
300	16 52.50	17 26.25	18 00.00	18 33.75	19 07.50
400	22 30.00	23 03.75	23 37.50	24 11.25	24 45.00
500	28 07.50	28 41.25	29 15.00	29 48.75	30 22.50
600	33 45.00	34 18.75	34 52.50	35 26.25	36 00.00
700	39 22.50	39 56.25	40 30.00	41 03.75	41 37.50
800	45 00.00	45 33.75	46 07.50	46 41.25	47 15.00
900	50 37.50	51 11.25	51 45.00	52 18.75	52 52.50
1000	56 15.00	56 48.75	57 22.50	57 56.25	58 30.00
1100	61 52.50	62 26.25	63 00.00	63 33.75	64 07.50
1200	67 30.00	68 03.75	68 37.50	69 11.25	69 45.00
1300	73 07.50	73 41.25	74 15.00	74 48.75	75 22.50
1400	78 45.00	89 18.75	79 52.50	80 26.25	81 00.00
1500	84 22.50	84 56.25	85 30.00	86 03.75	86 37.50

Mils	50	60	70	80	90
0	2°48′.75	3°22′.50	3°56′.25	4°30′.00	5°03′.75
100	8 26.25	9 00.00	9 33.75	10 07.50	10 41.25
200	14 03.75	14 37.50	15 11.25	15 45.00	16 18.75
300	19 41.25	20 15.00	20 48.75	21 22.50	21 56.25
400	25 18.75	25 52.50	26 26.25	27 00.00	27 33.75
500	30 56.25	31 30.00	32 03.75	32 37.50	33 11.25
600	36 33.75	37 07.50	37 41.25	38 15.00	38 48.75
700	42 11.25	42 45.00	43 18.75	43 52.50	44 26.25
800	47 48.75	48 22.50	48 56.25	49 30.00	50 03.75
900	53 26.25	54 00.00	54 33.75	55 07.50	55 41.25
1000	59 03.75	59 37.50	60 11.25	60 45.00	61 18.75
1100	64 41.25	65 15.00	65 48.75	66 22.50	66 56.25
1200	70 18.75	70 52.50	71 26.25	72 00.00	72 33.75
1300	75 56.25	76 30.00	77 03.75	77 37.50	78 11.25
1400	81 33.75	82 07.50	82 41.25	83 15.00	83 48.75
1500	87 11.25	87 45.00	88 18.75	88 52.50	89 26.25

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TABLE LVI.—*Conversion of degrees to mils, and of mils to degrees*—Continued

Conversion of mils to degrees and minutes—Continued

Mils	Minutes	Mils	Minutes	Mils	Minutes
1	3.38	4	13.50	7	23.63
2	6.75	5	16.88	8	27.00
3	10.13	6	20.25	9	30.38

Example: Convert 1254 mils to degrees and minutes.

1250 mils = 70° 18.75′
4 mils = 13.50′

1254 mils = 70° 32.25′.

[A. G. 062.11 (5-3-40).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
E. S. ADAMS,
Major General,
The Adjutant General.

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