A help to calculation, or, Two tables: the one of decimal numbers, and the other of their logarithmes ... : as also tables of declination, right and oblique ascensions, ascensional difference, and other tables of the Primum mobile ... / by J. Newton.

Contributors

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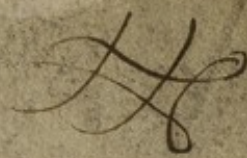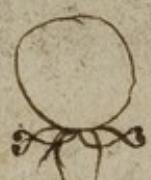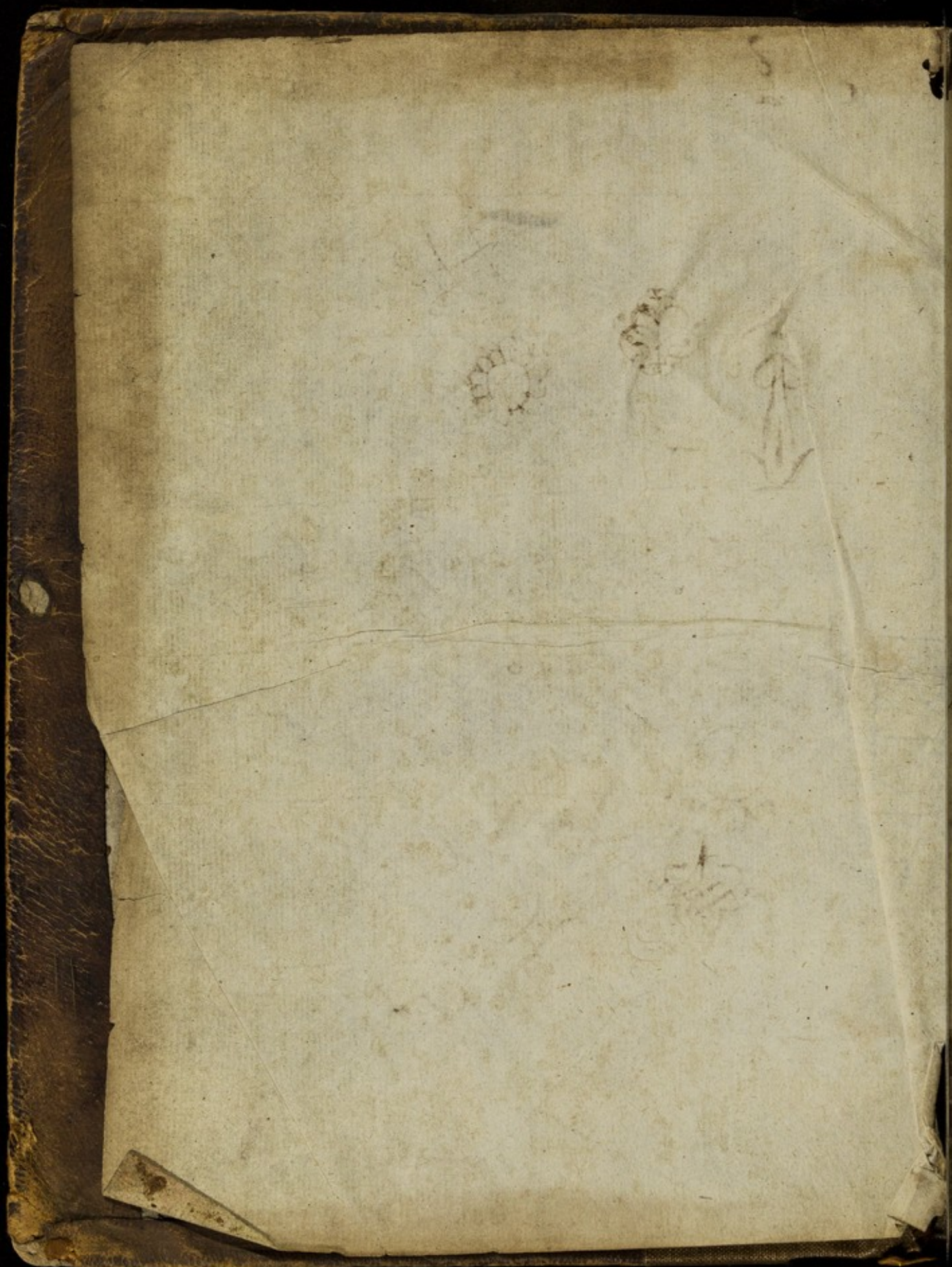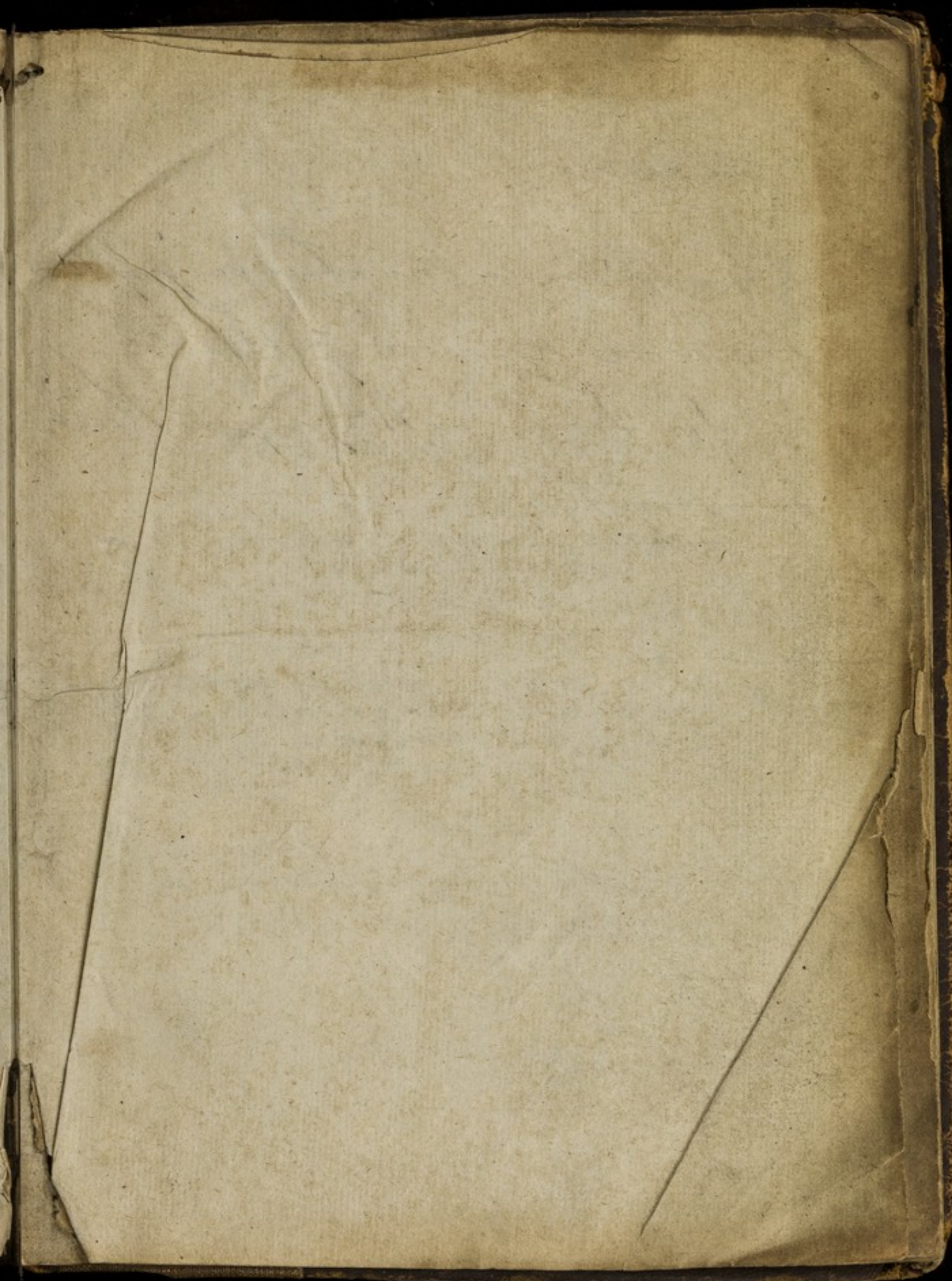
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17th May 1837.

A

HELP
TO
CALCULATION.
OR

Two Tables : the one of Decimal numbers,
and the other of their Logarithmes, for the ready
converting of Sexagenary Tables into Decimal, and
the contrary. And for the finding of the part
proportional in all Sexagenary
TABLES.

As also Tables of Declination , Right and
Oblique Afcenfions , Afcenfional Difference,
and other Tables of the *Primum Mobile*, for the
fpeedy and exact erecting of a Figure : In all
which the ufe of the former Tables in
taking the part proportional
will appear.

By *J. Newton*.

LONDON,

Printed by *Iofeph Moxon* , and fold at his fhop
on Cornhil, at the fign of *Atlas*, 1 6 5 7.

To the Courteous READER.

THat the *vulgar parts of Arithmetick*, as Addition, Substraction, Multiplication and Division *are much easier in whole numbers than in fractions is not to be disputed : but how that difficulty which is in vulgar fractions may be (if not removed, yet at left) abated, many ingenious Artists have earnestly indeavoured :* and Decimal Arithmetick *which some are pleased to stile a new invention, hath by those famous men of our own Nation,* Briggs, Gellibrand, *&* Oughtred, *been found the best and readiest help. But if we well consider, that the number of Characters by which all numbers are exprest are only ten, nine digits and a cypher; we may (in my apprehension) stile this Decimal way,* a Restauration of Arithmetick *to the first and most ancient principles of that Noble Science.*

Nor can I any more perceive what grounds or reasons former Ages had for their at first departing from this Decimal way, than I can for our not returning to it : I shall not undertake to devine the reasons of the one, but custome (as I perswade my self) is the best plea that can be given for the other : and that, I confesse, is hard to be changed in general without the stamp of Authority, and this is not easie to be procured, unlesse the Project bring more profit to the private undertaker, then to the publique: But why it should not be done in Astronomical Tables, and such like, which come to the scanning of none but Artists can never be sufficiently admired : if such whose Genius leads them to these noble Studies, will not depart from this tedious and troublesome sexagenary way themselves, it were to be wished that others might not be forced to it, as of necessity they must, until there be Tables published in another form, the which God willing shall not long be wanting ; and that those Decimal Tables of Astronomy which are intended, may be readily compared with these Sexagenary Tables already published, or now in the Presse : in the first of these issuing Tables thou maist readily find the Decimal of any sexagenary minutes and seconds, whether in time or motion, and the contrary ; the construction whereof we will shew first, and then the use.

PROBL.

PROBLEME I.

To turn sexagenary numbers into decimal, and the contrary.

THe decimal of a fraction given is usually found by the Rule of three, or golden rule of proportion in this manner:

As the denominator of a fraction, is to the Numerator: so is 10 or 100, to the decimal parts required.

Now then there being 60 minutes in a degree or hour the decimal answering unto 12 minutes, or to the fraction $\frac{12}{60}$ may thus be found, As 60 is to 12, so is 100 to 20.

Again, there being 3600 seconds in a degree or hour, to finde the decimal answering unto 16 seconds, or to $\frac{16}{3600}$, I say,

As 3600 is to 16, so is 10.000, to 0044.

And according to these directions you may find the Decimals answering to any thirds, fourths, fifths, or any other fraction of a degree.

Or the decimal answering to one minute, one second, one third, &c. may thus be found: By the former proposition, a unit with cyphers is the decimal of one degree, or 60 minutes; and if 100.000 be the decimal of 60 minutes, 50.000, which is the half of it, must be the decimal of 30 minutes, 25.000 the decimal of 15 minutes, and 08333, which is the third part of 25.000, is the decimal of five minutes, and 01666, the fifth part of 08333, is the decimal of one minute, and thus proceeding downward you may also find the decimal of a second, third, fourth or fifth, or any other fraction part of a degree propounded, or of the fraction parts of any other integers whatsoever. And having found the decimal of the least part desired, the rest are easily found by a continual addition of that unto it self, until you have made as many decimal numbers, as there are fraction parts in the integer propounded. Thus 03333, the double of 01667 is the decimal of two minutes, 05000 the decimal of 3, &c.

The fraction answering to any decimal is also found by the Rule of three, in this manner: As 100.000, to the decimal number given; so is the Denominator of a fraction, to the Numerator. And therefore, as 100 to 20, so 60 to 12. By this you may see the

the conftruction of the Decimal table, the ufe whereof is two-
fold: Firft,

PROBL. 2.

To finde the decimal of any fexagenary number, and the contrary.

Et it be required to find the decimal anfwering to 37 minutes
25 feconds, 16 thirds, 5 fourths, 29 fifths in motion.

In the firft page of the Table, I find 37 minutes 12 feconds,
which is the neereft leffe, and 62 anfwering thereunto, and in
the third column of the fecond page I find in the top 12 feconds,
and looking downward in the fame column till I come to 25 fe-
conds, I find in the laft column of the page, right againft the
25 feconds, this number 36111111, which being annexed to 62.

The decimal of 37 min. 25 feconds	6236111111
The decimal of 16 thirds	0000740741
The decimal of 5 fourths	0000003858
The decimal of 29 fifths	0000000373
Their fum is the decimal fought	6236856083

Example 2.

If it be required to find the decimal of 8 hours, 17 minutes;
you muft firft find how many minutes and feconds in motion do an-
fwer to your hours and minutes in time by the top of the Table of
Logarithmes, and in the 24 page of thefe Tables, I find that 40
minutes in motion are anfwerable to 8 hours in time, and in the
table before that I find that one minute 25 feconds in motion are
anfwerable unto 17 minutes in time, which being added to the 40
minutes, the fumme is 41 minutes, 25 feconds, and the decimal
thereof, by the laft Probleme, is 6902777.118.

To find the parts of a degree in motion, or of a day in time
anfwering to any Decimal given, is but the contrary work to the
former, and needeth no example.

PROBL. 3.

To find the part proportional in all fexagenary Tables.

THe part proportional in all fexagenary Tables is fomewhat
troublefome to find, either by the numbers themfelves given,

or

or by a usual sexagenary Table; but by this Table it will be easily found, either by Multiplication onely, or onely by Division. If a degree or a day be the first term in the proportion, the part proportional will be found by Multiplication onely, otherwise by Division.

Example.

	Decimals
If one degree	100.000
Give 7 minutes 45 seconds	12916
What will 27 minutes give	45000
The product of the second and third	0581220000

Which being sought in the Table, gives 3 minutes, 29 seconds.

Example 2.

	Decimals
If 23 minutes 15 seconds	38750
Give one degree	100.000
What shall 3 minutes 27 seconds give	05750
The product of the second and third	0575000000

Which being divided by the first term, the quotient shall be 01483, the decimal of 8 minutes, 54 seconds.

But this may be more readily found by the Table following, in which you have the Logarithmes of these decimal numbers, whose construction and use is thus.

PROBL. 4.

To make the Logarithme answering to the decimal parts of a Degree.

THe construction of Logarithmes in the general is fully explained by M. Briggs in his Arithmetica Logarithmica, an Epitome whereof you may see in Mr. Wingates Construction of Logarithmes, or in mine own Mathematical Institution: That which I here intend is onely to shew you how from thence this Logarithmetical way was deduced. I need not tell you that Logarithmes do perform that by Addition and Substraction, which in vulgar numbers must be made Multiplication and Division.

Though

Though the Logarithmes of these decimal numbers then, are to be made by the same rule with the decimal numbers themselves, that is, by the rule of three; yet is their construction by that Rule much easier then the construction of the other; but the tedious work in the construction of the Decimals by the rule of three is avoided by other rules, as hath been shewed already, which cannot be in the construction of the Logarithmes of those Decimals, yet for use the Table of Logarithmes is much neater and easier; nor is the construction so very difficult. For,

		Logarithms
As 60	co. ar.	8.2218488
Is to 12		1.0791812
So is 100		2.0000000
To 20		1.3010300

PROBL. 5.
To find the part proportional in all Sexagenary Tables, by this Table of Logarithmes.

IN this Table of Logarithmes you have the minutes on the head, and the seconds in the side, and in their common Area the Logarithm thereof; thus the Logarithm of 7 minutes 45 seconds will be found 9.111149. But if you were to find the Logarithm of any part of a day, there is a little more trouble; for by the first leaf of this Table you must see how many minutes and seconds of a degree do answer to the minutes of an hour given. As if it were required to find the Logarithme of 9 hours 39 minutes: by the Table of Logarithmes 45 minutes in motion do answer to 9 hours in time, making 12 hours the Integer, and by the first leaf of this Table 3 minutes 15 seconds do answer to 39 minutes, and the Logarithme answering to 48 minutes 15 seconds is 9.905345, the which is also the Logarithm of 9 hours 39 minutes. Now then to illustrate the use of this Table by example, suppose the question were this;

If one degree	10.000000
Give 7 minutes 45 seconds	9.111149
VVhat shall 27 minutes give	9.653212
The answer is 3 minutes 29 seconds	8.764361

Exam-

Example 2.

If 23 minutes 15 seconds	Substract	9,588271
Give one degree		10.000000
What shall 3 minutes 27 seconds give		8.759667
The answer is 8 minutes 54 seconds		9.171396

Example 3.

If the Sun in one day move 59 min. 38 sec. how much doth he move in 21 hours 44 min. In this question a day is supposed to consist of 24 hours, whereas our Table hath but 12, I therefore take the half thereof, and say

If 12 hours	10.000000
Give 29 min. 49 sec.	9.696307
VVhat shall 9 hours 44 minutes give	9,909079
The answer is 24 min. 11 sec.	9.605386

Which being added to 29 min. 49 sec. the motion answering to 21 hours 44 min. is 54 min. 0 sec.

By this little which hath been said, there is enough to demonstrate either of these Tables to be much more ready for practice than that which hath been hitherto used, and of the Table of Logarithms we shall yet add some few examples in taking the part proportional in the Tables following.

PROBL. 6.
The use of the table of Declinations.

Having done with the decimal Tables, and Tables of Logarithmes, we now come to the Primum Mobile, or Doctrine of the Sphere, in which the first Table that needeth any explanation is a Table of Declinations.

And there the Declination of the Sun or other planet is found by the sign in the head or foot, and the degree on the right side, if the sign be in the foot, or on the left side, if it be in the head; for the common angle gives the Declination sought, if you have respect to your Planets proper latitude, and the part proportional.

For example. Suppose the moon were in 19 degrees 53 min. of Leo, and her declination were required, having North latitude 3 degrees.

The

The declination in that Latitude to	19d. of Leo is	18d.	01 m.
	20d. of Leo is	17	42
Their difference is		00	19

Now if one degree give 19 min.   9.500601
VVhat shall 33 min. give?   9.740392
The answer is 10 min. 27 sec.   9.240963

Which being substracted from 18.01, because the declination doth decrease, the moons declination will be 17 d. 51 m. 27 sec.

PROBL. 7.

The use of the table of Right Ascensions.

THe Right Ascension by the Table following is had by the sign in the head, and the degree in the left side, and in the common angle is the Right Ascension.

Example. If the Right Ascension of a planet in 12 d. 15 m. of Aries, and 2 deg. of south latitude be sought.

The Right ascension of	13 deg.	12.	44
	12 deg.	11.	49
Difference		00.	55

If one degree give 55 min.   9.962210
VVhat shall 15 min. give?   9.397939
The answer is 13.44   9.360149

Which being added to 11 d. 49 m. the Right Ascension of the point sought will be 12.02.44. But if the Right Ascension of the point sought be in Southern signs, you must add 180 d. to the arch found in the Table, and you have your desire. Thus the right ascension of 12 d. 15 m. of Libra, with two degrees of North latitude, by adding 180 to the former arch will be 192.02.

PROBL. 8.

To find the Ascensional difference:

THe ascensional difference of any part of the Zodiack is found by the deg. of declination in the left side, and the deg. of the Poles elevation in the head, the common angle gives the ascensional difference sought. Example. Let a planets declination be 4.26, whose ascensional difference is sought under the elevation of 52 deg. The ascensional difference in that elevation answering to 5 deg. of declination is 6.26, to 4 deg. is 5.08, difference 1.18

a   If

If one degree give 1.18.   8,335791
VVhat shall 26 min. give   9.656821
The answer is 33 min.   7.972612
Which being added to 5.08, the ascensional difference of the point sought will be 5.41.

PROBL. 9.
To find the Oblique ascension.

THe oblique ascension of any part of the Zodiack is found by the sign and degree in the first column on the left hand, and the Poles elevation on the head of the table, the common angle will give you the oblique ascension sought.

Example. Let the oblique ascension of 9 deg. 14 min. of Virgo in the elevation of 42 deg. be sought.

The Oblique ascension of	10 deg. is	154	26
	6 deg. is	149	18
Difference		5	8

If 4 deg.   8.823908
Give 5 d. 8 m.   8.932247
What shall 3 d. 14 m. give ?   8.731499
Their summe   17,663746
From which subtract the first, the answer is 4.09   8,839838
Which being added to 149.18, the Oblique ascens. will be 153.27

PROBL. 10.
To find the Mid-heaven.

THese things premised, the Right ascension of the Midheaven, and thereby the Midheaven it self will easily be found, for the hours from noon converted into Æquinoctial degrees, (by the Table for that purpose) being added to the Suns right ascension, do make the right ascens. of the Mid-heaven, which sought in the table of Right Ascensions gives the Midheaven it self.

Example. Let the Sun be in 4 deg. 4 min. of Virgo, the time from noon 18 hours 27 min.

The Suns Right Ascension in	4 deg. is	155	54
	5 deg. is	156	51
Difference			57

If

If one degree give 57 minutes   9,977723

    What shall 4 minutes give ? | 8,823908

    The answer is 3 min. 48 sec.   8.801631

Which being added to 155.54. the Suns Right Ascension is 155,58 *feré*.

The *Æquinoctial* degrees answering to 18 hours, viz. 270 d. and the degrees answering to 27 min. of an hour are 6 deg. 45 min. and therefore the *Right Ascens.* of time is 276.45, which being added to the Suns *Right ascens.* their aggregate 432.43, or rejecting 360, the remainer 72.43 is the *Right ascens.* of the *Midheaven*, whereto answers in the *Table of Right Ascensions* 14 deg. 40 min. of *Gemini*, which is the point of the *Ecliptique* for the *Midheaven* it self.

PROBL. II.
To finde the Cusps of the other Houses.

THE *Oblique Ascensions* of the other *Houses* are found by a continual addition of 30 deg. to the right *ascens.* of the *Midheaven*. Thus the oblique *ascens.* of the 11 *house* is 102.43. of the 12 *house* 132.43, of the *Ascendant* 162.43, of the *second house* 192.43. of the third *house* 222.43.

The *Poles* elevation above the circle of *Position* of the *Ascendant* is always the same with that of the place, for which the *Figure* is erected ; the *Poles* elevation for the 11, 12, 2, and 3 houses, you may find in the *Table* for that purpose, annexed to the *Table* of the *Poles* elevation above any circle of *position*.

Example. By that *Table* under our elevation of 51,32, the poles elevation above the circles of *position* of the 11 and 3 houses is 32,11, and the poles elevation above the 12 and 2 houses is 47,28.

Now then to find the cusp of the 11 *house*, look the oblique *ascension* thereof 102.43 in the table of *Oblique ascensions* answering to 32.11 of elevation. and the point of the *Ecliptique* answering thereunto is *Cancer* 24.58. In lik. manner, if you look the oblique *ascens.* of the 12 *house*, 132.43 under the elevation of 47.28. the cusp thereof will be *Leo* 25.15. If you look the oblique *ascens.* of the *Ascendant* 162.43. under the elevation of 51,32, the cusp thereof will be *Virgo* 17,56. If

If you look the oblique afcenfion of the fecond houfe 192.43 under the elevation of 47,28, the cufp will be Libra 9.26.

Laftly, if you look the oblique afcenfion of the third houfe 222. 43, under the elevation of 32,11, the cufp will be Scorpio 6,21.

The other fix houfes are in the fame degrees and minutes of the oppofite fignes.

PROBL. 12.

To find the Poles elevation above any circle of pofition.

THe Poles elevation above the Horizon of a ftar is found by the degree of his Declination in the fecond column of the right hand page of the Table, if the Declination thereof be North under the earth, or South above it ; and in the fecond column of the left hand page, if the Declination be South under the earth, or North above it, and his diftance from the Meridian in a ftraight line, for in the head of your Table in a direct line (ufing a double proportion if need be) you fhall have the degree of the Poles elevation above the circle of pofition.

Example Let the Sun be in 4 deg. 4 minutes of Virgo, and his declination 10 degrees 3 minutes North above the earth, his diftance from the Meridian 83 deg. 9 min. Now then to finde the Poles elevation, I look in that Table for the Suns declination in the fecond column of the left hand page, and his diftance from the Meridian in a ftraight line, and in that laft Folio of that table I find againft 10 degrees of declination the diftance of a ftar from the Meridian neereft to my number to be 83,32, and over the head thereof 50, which is the degree of the Poles elevation above that circle of pofition.

A Help

To

CALCULATION,

Or

Two Tables, the one of Decimall
numbers, and the other of their *Logarithmes*, for the
ready converting of *Sexagenerary* Tables into *Decimall*,
and the contrary.

And

For the finding of the Part Proportionall
in all Sexagenary Tables

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For the finding of the Part Proportionall
in all Sexagenary Tables

C	M.S.	C	M.S.	C	M.S.
1	0.36	34	20.24	67	40.12
2	1.12	35	21. 0	68	46.48
3	1.48	36	21.36	69	41.24
4	2.24	37	22.12	70	42. 0
5	3. 0	38	22.48	71	42.36
6	3.36	39	23.24	72	43.12
7	4.12	40	24. 0	73	43.48
8	4.48	41	24.36	74	44.24
9	5.24	42	25.12	75	45. 0
10	6. 0	43	25.48	76	45.36
11	6.36	44	26.24	77	46.12
12	7.12	45	27. 0	78	46.48
13	7.48	46	27.36	79	47.24
14	8.24	47	28.12	80	48. 0
15	9. 0	48	28.48	81	48.36
16	9.13	49	29.24	82	49.12
17	10.12	50	30. 0	83	49.48
18	10.48	51	30.36	84	50.24
19	11.24	52	31.12	85	51. 0
26	12. 0	53	31.48	86	51.36
21	12.36	54	32.24	87	52.12
22	13.12	55	33. 0	88	52.48
23	13.48	56	33.36	89	53.24
24	14.24	57	34.12	90	54. 0
25	15. 0	58	34.48	91	54.36
26	15.36	59	35.24	92	55.12
27	16.12	60	36. 0	93	55.48
28	16.48	61	36.36	94	56.24
29	17.24	62	37.12	95	57. 0
30	18.00	63	37.48	96	57.36
31	18.36	64	38.24	97	58.12
32	19.12	65	39. 0	98	58.48
33	19.48	66	39.36	99	59.24
				100	60. 0

0	36	12	48	24	00000000
1	37	13	49	25	0777778
2	38	14	50	26	05555555
3	39	15	51	27	08333333
4	40	16	52	28	11111111
5	41	17	53	29	13888889
6	42	18	54	30	16666667
7	43	19	55	31	19444444
8	44	20	56	32	22222222
9	45	21	57	33	250
10	46	22	58	34	27777778
11	47	23	59	35	30555555
12	48	24	1.00	36	33333333
13	49	25	1	37	36111111
14	50	26	2	38	38888889
15	51	27	3	39	41666667
16	52	28	4	40	44444444
17	53	29	5	41	47222222
18	54	30	6	42	5000
19	55	31	7	43	52777778
20	56	32	8	44	55555555
21	57	33	9	45	58333333
22	58	34	10	46	61111111
23	59	35	11	47	63888889
24	1.00	36	12	48	66666667
25	1	37	13	49	69444444
26	2	38	14	50	72222222
27	3	39	15	51	750
28	4	40	16	52	77777778
29	5	41	17	53	80555555
30	6	42	18	54	83333333
31	7	43	19	55	86111111
32	8	44	20	56	88888889
33	9	45	21	57	91666667
34	10	46	22	58	94444444
35	11	47	23	59	97222222

	Thirds	Fourths	Fifths
1	0000046296	0000000772	0000000013
2	92593	1543	26
3	138889	2315	39
4	185185	3046	51
5	231481	3858	64
6	277778	4630	77
7	324074	5401	90
8	370370	6173	103
9	416667	6944	116
10	462963	7716	129
11	509259	8488	141
12	555556	9259	154
13	601852	10031	167
14	648148	10802	180
15	694444	11574	193
16	740741	12345	206
17	787037	13117	219
18	833333	13889	232
19	879630	14660	245
20	925926	15432	258
21	972222	16204	270
22	1018518	16975	283
23	1064814	17747	296
24	1111111	18518	309
25	1157407	19290	322
26	1203703	20062	335
27	1250000	20833	348
28	1296296	21605	360
29	1342592	22376	373
30	1388888	23148	386

	Thirds	Fourths	Fifths
31	00014351841	000002392c	0000000399
32	1481481	24691	412
33	1527777	25463	425
34	1574073	26234	438
35	1620370	27006	450
36	1666666	27778	463
37	1712963	28549	476
38	1759259	29321	489
39	1805556	30092	502
40	1851852	30864	515
41	1898148	31636	527
42	1944444	32407	540
43	1990740	33179	553
44	2037037	33950	566
45	2083333	34722	579
46	2129629	35494	592
47	2175925	36265	605
48	2222222	37037	618
49	2268518	37808	630
50	2314815	38580	643
51	2361111	39352	656
52	2407407	40123	669
53	2453703	40895	682
54	2500000	41666	694
55	2546296	42438	707
56	2592592	43210	720
57	2638889	43981	733
58	2685185	44753	746
59	2731481	45524	759
60	2777778	46296	772

0	24	48	12	36	
1	25	49	13	37	0000115740
2	26	50	14	38	231481
3	27	51	15	39	347222
4	28	52	16	40	462962
5	29	53	17	41	578702
6	30	54	18	42	694444
7	31	55	19	43	810184
8	32	56	20	44	925924
9	33	57	21	45	1041666
10	34	58	22	46	1157407
11	35	59	23	47	1273148
12	36	60	24	48	1388889
13	37	1	25	49	1504629
14	38	2	26	50	1620370
15	39	3	27	51	1736110
16	40	4	28	52	1851851
17	41	5	29	53	1967592
18	42	6	30	54	2083333
19	43	7	31	55	2199074
20	44	8	32	56	2314814
21	45	9	33	57	2430555
22	46	10	34	58	2546296
23	47	11	35	59	2662036
24	48	12	36	60	2777778

S.	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.
0	00	00	12	00	24	00	36	00	48	00
1	00	12	12	12	24	12	36	12	48	12
2	00	24	12	24	24	24	36	24	48	24
3	00	36	12	36	24	36	36	36	48	36
4	01	48	12	48	24	48	36	48	48	48
5	01	00	13	00	25	00	37	00	49	00
6	01	12	13	12	25	12	37	12	49	12
7	01	24	13	24	25	24	37	24	49	24
8	01	36	13	36	25	36	37	36	49	36
9	01	48	13	48	25	48	37	48	49	48
10	02	00	14	00	26	00	38	00	50	00
11	02	12	14	12	26	12	38	12	50	12
12	02	24	14	24	26	24	38	24	50	24
13	02	36	14	36	26	36	38	36	50	36
14	02	48	14	48	26	48	38	48	50	48
15	03	00	15	00	27	00	39	00	51	00
16	03	12	15	12	27	12	39	12	51	12
17	03	24	15	24	27	24	39	24	51	24
18	03	36	15	36	27	36	39	36	51	36
19	03	48	15	48	27	48	39	28	51	48
20	04	00	16	00	28	00	40	00	52	00
21	04	12	16	12	28	12	40	12	52	12
22	04	24	16	24	28	24	40	24	52	24
23	04	26	16	36	28	36	40	36	52	36
24	04	48	16	48	28	48	40	48	52	48
25	05	00	17	00	29	00	41	00	53	00
26	05	12	17	12	29	12	41	12	53	12
27	05	24	17	24	29	24	41	24	53	24
28	05	36	17	37	29	36	41	36	53	36
29	05	48	17	48	29	48	41	48	53	48
30	06	00	18	00	30	00	42	00	54	00

S.	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.
30	06	00	18	00	30	00	42	00	54	00
31	06	12	18	12	30	12	42	12	54	12
32	06	24	18	24	30	24	42	24	54	24
33	06	36	18	36	30	36	42	36	54	36
34	06	48	18	48	30	48	42	48	54	48
35	07	00	19	00	31	00	43	00	55	00
36	07	12	19	12	31	12	43	12	55	12
37	07	24	19	24	31	24	43	24	55	24
38	07	36	19	36	31	36	43	36	55	36
39	07	48	19	48	31	48	43	48	55	48
40	08	00	20	00	32	00	44	00	56	00
41	08	12	20	12	32	12	44	12	56	12
42	08	24	20	24	32	24	44	24	56	24
43	08	36	20	36	32	36	44	36	56	36
44	08	48	20	48	32	48	44	48	56	48
45	09	00	21	00	33	00	45	00	57	00
46	09	12	21	12	33	12	45	12	57	12
47	09	24	21	24	33	24	45	24	57	24
48	09	36	21	36	33	36	45	36	57	36
49	09	48	21	48	33	48	45	48	57	48
50	10	00	22	00	34	00	46	00	58	00
51	10	12	22	12	34	12	46	12	58	12
52	10	24	22	24	34	24	46	24	58	24
53	10	36	22	36	34	36	46	36	58	36
54	10	48	22	48	34	48	46	48	58	48
55	11	00	23	00	35	00	47	00	59	00
56	11	12	23	12	35	12	47	12	59	12
57	11	24	23	24	35	24	47	24	59	24
58	11	36	23	36	35	36	47	36	59	36
59	11	48	23	48	35	48	47	48	59	48
60	12	00	24	00	36	00	48	00	60	00

S	Logarith	Logarith	Logarith	Logarith	Logarith
0	0,000000	8,221848	8,522878	8,698970	8,823908
1	6,443697	8,229026	8,526482	8,701366	8,825714
2	6,744727	8,236088	8,530056	8,703768	8,827512
3	6,920818	8,243037	8,533602	8,706148	8,829313
4	7,045757	8,249877	8,537118	8,708515	8,831086
5	7,142667	8,256610	8,540607	8,710869	8,832863
6	7,221848	8,263240	8,544067	8,713210	8,834632
7	7,288795	8,269771	8,547500	8,715539	8,836394
8	7,346787	8,276205	8,550906	8,717855	8,838149
9	7,397939	8,282546	8,554286	8,720159	8,839796
10	7,443697	8,288795	8,557640	8,722441	8,841737
11	7,485089	8,294955	8,560968	8,724730	8.843371
12	7,522878	8,301029	8,564270	8,726998	8,845098
13	7,557640	8,307019	8,567548	8,729254	8,846818
14	7,589825	8,312928	8,570801	8,731499	8,848531
15	7,619788	8,318758	8,574030	8,733732	8,850237
16	7,647817	8,324510	8,577235	8,735953	8,851936
17	7,674145	8,330187	8,580417	8,738163	8,853630
18	7,698969	8,335791	8,583576	8,740362	8,855316
19	7,722450	8,341324	8,586711	8,742540	8,856996
20	7,744727	8,346787	8,589825	8,744726	8,858670
21	7,765916	8,352182	8,590916	8,746893	8,860338
22	7,786119	8,357510	8,595985	8,749048	8.861998
23	7,805424	8,362775	8,599033	8,751193	8,863653
24	7,823908	8,367976	8,602059	8,753327	8,865301
25	7,841637	8,373115	8,605065	8,755451	8,866943
26	7,858670	8,378195	8,608050	8,757564	8,868579
27	7,875060	8,383216	8,611014	8,759667	8,870208
28	7,890855	8,388179	8,613959	8,761760	8,871832
29	7,906095	8.393087	8,616883	8,763843	8,873449
30	7,920818	8,397939	8,619788	8,765916	8,875061

M.	0	1	2	3	4
S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	7,920818	8,397939	8,619788	8,765916	8,875061
31	7,935058	8,402738	8,622674	8,767979	8,876666
32	7,948847	8,407484	8,625541	8,770033	8,878266
33	7,952210	8,412179	8,628388	8,772076	8,879860
34	7,975175	8,416824	8,631218	8,774111	8,881448
35	7,987765	8,421420	8,634029	8,776125	8,883030
36	7,999999	8,425968	8,636822	8,778151	8,884606
37	8,011898	8,430468	8,639596	8,780156	8,886176
38	8,023480	8,434923	8,642354	8,782153	8,887742
39	8,034761	8,439332	8,645094	8,784141	8,889301
40	8,045757	8,443697	8,647816	8,785924	8,890855
41	8,056480	8,448018	8,650523	8,788089	8,892403
42	8,066946	8,452297	8,653212	8,790040	8,893946
43	8,077165	8,456534	8,655884	8,792002	8,895483
44	8,087149	8,460730	8,658541	8,793945	8,897015
45	8,096909	8,464886	8,661181	8,795880	8,898542
46	8,106454	8,469002	8,663805	8,797805	8,900063
47	8,115794	8,473080	8,666413	8,799723	8,907579
48	8,124938	8,477120	8,669006	8,801622	8,906079
49	8,133893	8,481123	8,671584	8,803532	8,904595
50	8,142667	8,485089	8,674146	8,805425	8,906095
51	8,151267	8,489020	8,676793	8,807309	8,907590
52	8,159700	8,492915	8,679225	8,809185	8,909080
53	8,167972	8,496775	8,681743	8,811053	8,910565
54	8,176090	8,500601	8,684246	8,812903	8,912044
55	8,184059	8,504394	8,686735	8,814765	8,913519
56	8,191885	8,508155	8,689210	8,816609	8,914989
57	8,199571	8,511882	8,691670	8,818445	8,916443
58	8,207125	8,515579	8,694117	8,820274	8,917913
59	8,214549	8,519243	8,696550	8,822095	8,919368
60	8,221848	8,522878	8,698970	8,823908	8,9208..

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	M.	5	6	7	8	9
S.		Logarith	Logarith	Logarith	Logarith	Logarith
0		8.920818	8.999999	9.066946	9.124938	9.176090
1		8.922223	9.901204	9.067079	9,125842	9:176894
2		8.923703	9.002405	9.069009	9.126744	9.177696
3		8.925139	9.003603	9.070037	9.127644	9.178496
4		8.926570	9.004798	9.071062	9.128542	9.179295
5		8.927996	9.005989	9.072085	9,129438	9.180093
6		8.929718	9.007078	9.073106	9.130333	9.180889
7		8.930835	9.008263	9.074124	9.131225	9.181684
8		8.932247	9.009544	9,075140	9.132116	9.182477
9		8.933655	9.010723	9.076154	9.133005	9.183269
10		8.935058	9.011898	9.077165	9.133893	9.184059
11		8.936457	9.013070	9.078174	9.134778	9,184848
12		4.937851	9.014239	9.079180	9.135662	9.185636
13		8.939241	9.015405	9.080184	9.136743	9.186422
14		8.940626	9.016568	9.081186	9.137423	9.187206
15		8.942007	9.017728	9.082186	9.138302	9.187989
16		8.943384	9.018874	9.083183	9.139178	9.188771
17		8.944756	9.020038	9.084178	9.140053	9.189552
18		8.946124	9.021188	9.085177	9.140926	9.190331
19		8.947487	9,022336	9.086161	9.141797	9.191108
20		8.948846	9.023480	9.087149	9.142667	9.191885
21		8.950202	9.024621	9.088135	9.143534	9.192659
22		8.951552	9.025760	9.089119	9.144400	9.193433
23		8.952899	9,026895	9.090106	9.145264	9.194205
24		8.954242	9.028028	9.091079	9.146127	9.194976
25		8.955580	9.029157	9.092057	9.146988	9.195745
26		8.956914	9.030284	9.093031	9.147847	9.196513
27		8.958244	9.031407	9.094004	9.148704	9.197280
28		8.959570	9.032528	9.094975	9.149560	9.197945
29		8.960892	9.033646	9.095943	9.150414	9.198809
30		8.962210	9.034761	9.096909	9.151267	9.199571

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	8.962210	9.034761	9.096909	9.151267	9.199571
31	8.963524	9.035873	9.097873	9.152117	9.200333
32	8.964835	9.036983	9.098835	9.153966	9.201093
33	8.966141	9.038089	9.099795	9.154814	9.201851
34	8.967443	9.039193	9.100752	9.155660	9.202608
35	8.968741	9,040294	9.101708	9.156504	9.203364
36	8.970036	9.041392	9.102667	9.157346	9.204129
37	8.971326	9.042487	9.103613	9.158187	9.204872
38	8.972613	9.043580	9.104562	9.158026	9.205624
39	8.973896	9.044669	9.105509	9.158864	9.206375
40	8.975175	9.045756	9.106454	9.159700	9.207124
41	8.976451	9.046841	9.107397	9.160534	9.207873
42	8.977723	9.047923	9.108338	9.161367	9.208729
43	8.978991	9.049002	9.109277	9.162198	9.209365
44	8.980255	9.050078	9.110214	9.163028	9.210109
45	8.981516	9.051152	9.111149	9.163856	9.210852
46	8.982773	9.052223	9.112082	9.164682	9.211794
47	8.984026	9.053294	9.113013	9.165507	9.212335
48	8.985276	9.054357	9.114942	9.166330	9.213074
49	8.986522	9.055420	9.114869	9.167152	9.213812
50	8.987765	9.056480	9.115794	9.167972	9.214549
51	8.989004	9.057538	9.115717	9.168791	9.215274
52	8.990239	9.058514	9.117638	9.169608	9.216028
53	8.991471	9.059647	9.118558	9.170424	9.216751
54	8.992700	9.060697	9.119475	9.171238	9.217483
55	8.993925	9.061645	9.120390	9.172050	9.218213
56	8.995146	9.062790	9.121303	9.172861	9.218943
57	8.996365	9.063833	9.122215	9.173671	6.219671
58	8.997580	9.064873	9.123124	9.174479	9.220398
59	8.998791	9.065911	9.124032	9.175285	9.221123
60	8.999999	9.066996	9.124938	9.176090	9.221848

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.221848	9.263240	9.301029	9.335791	9.367976
1	9.222571	9.263898	9.301632	9.336348	9.368492
2	9.223293	9.264554	9.302234	9.336903	9.369009
3	9.224014	9.265210	9.302835	9.337458	9.369524
4	9.224733	9.265865	9.303435	9.338013	9.360039
5	9.225452	9.266518	9.304035	9.338566	9.370553
6	9.226169	9267171	9.304633	9.339119	9.371067
7	9.226885	9.267822	9.305231	9.339671	9.371580
8	9.227600	9.268473	9.305828	9.340223	9.372092
9	9.228314	9.269123	9.306424	9.340774	9.372604
10	9.229026	9.269771	9.307029	9.341324	9.373115
11	9.229738	9.270419	9.307614	9.342873	9.373626
12	9.230448	9.271066	9.308208	9.342422	9.374136
13	9.231157	9.271712	9.308800	9.342970	9.374646
14	9.231865	9.272356	9.309393	9.343517	9.375154
15	9.232572	9.273000	9.309984	9.344064	9.375663
16	9.233277	9.273643	9.310574	9.344610	9.376170
17	9.233982	9.274285	9.311164	9.345155	9.376777
18	9.234685	9.274926	9.311753	9.345699	9.377184
19	9.235387	9.275566	9.312341	9.346243	9,377690
20	9.236088	9.276205	9.312920	9.346786	9.378195
21	9.236788	9.276844	9.313515	9.347329	9.378700
22	9.237487	9.278481	9.314100	9.347871	9.379204
23	9.238185	6.278117	9.314785	9.348412	9.379707
24	9.238881	9.279753	9.315269	9.348953	9.380210
25	9.239577	9.279387	9.315853	9.349492	9.380713
26	9.240271	9.280021	9.316435	9.350032	9.381214
27	9.240964	9.280653	9.317017	9.350570	9.381716
28	9.241656	9.281285	9.317598	9.351108	9.382216
29	9.242347	9.281916	9.318178	9.351645	9.382716
30	9.243037	9.282546	9.318758	9.352182	9.383216

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.243037	9.282546	9.318758	9,352182	9,383216
31	9.243726	9.283175	9.319306	9,352717	9,383715
32	9.244414	9.283803	9.319914	9,353253	9,384213
33	9.245100	9.284430	9.320491	9,353787	9,384711
34	9.245786	9.285056	9.321068	9,354321	9,385208
35	9.246470	9.285681	9.321643	9,354854	9,385705
36	9.247154	9.286306	9.322218	9,355387	9,386201
37	9.247836	9.286929	9.322792	9,355919	9,386696
38	9.248517	9.287552	9.323366	9,356450	9,387191
39	9.249197	9.288174	9.323938	9,356980	9,387685
40	9.249876	9.288795	9,324510	9,357510	9,388179
41	9.250555	9.289415	9,325081	9,358040	9,388672
42	9.251232	9.290034	9,325651	9,358568	9,389165
43	9.251907	9.290652	9,326221	9,359096	9,389657
44	9.252582	9.291269	9,326790	9,359624	9,390149
45	9.253256	9.291886	9,327358	9,360150	9,390640
46	9.253929	9.292501	9,327925	9,360677	9,391130
47	9.254601	9.293116	9,328492	9,361202	9,391620
48	9.255272	9.293730	9,329058	9,361727	9,392109
49	9.255941	9.294343	9,329623	9,362251	9,392598
50	9.256610	9.294955	9,330187	9,362775	9,393087
51	9.257277	9.295566	9,330751	9,363298	9,393574
52	9.257944	9.296176	9,331314	9,363820	9,394061
53	9.258610	9.296786	9,331876	9,364342	9,394548
54	9.259274	9.297395	9,332437	9,364863	9,395034
55	9.259938	9.298003	9,332998	9,365383	9,395520
56	9.260600	9.298610	9,333558	9,365903	9,396005
57	9.261262	9.299216	9,334118	9,366422	9,396489
58	9.261922	9.299821	9,334676	9,366941	9,396973
59	9.262582	9.300425	9,335234	9,367458	9,397456
60	9.263240	9.301029	9,335791	9,367976	9,397939

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.397939	9.425968	9.452297	9.477120	9.500601
1	9.398421	9.426420	9.452722	9.477522	9.500982
2	9.388903	9.426872	9.453147	9.477924	9.501363
3	9.399384	9.427323	9.453572	9.478325	9.501743
4	9.399865	9.427774	9.453996	9.478726	9.502123
5	9.400345	9.428224	9.454420	9.478126	9.502502
6	9.400825	9.428674	9.454844	9.479526	9.502881
7	9.401304	9.429123	9.455267	9.479926	9.503260
8	9.401782	9.429572	9.455690	9.480325	9.503638
9	9.402260	9.430020	9.456112	9.480724	9.504017
10	9.402738	9.430468	9.456534	9.481123	9.504394
11	9.403215	9.430916	9.456955	9.481524	9.504777
12	9.403691	9.431363	9.457376	9.481919	9.505149
13	9.404167	9.431809	9.457897	9.482317	9.505526
14	9.404643	9.432255	9.458217	9.482714	9.505902
15	9.405118	9.432701	9.458637	9.483111	9.506278
16	9.405592	9.433146	9.459056	9.483507	9.506654
17	9.406066	9.433591	9.459475	9.483903	9.507030
18	9.406539	9.434035	9.459894	9.484299	9.507405
19	9.407012	9.434479	9.460312	9.484694	9.507780
20	9.407484	9.434923	9.460730	9.485089	9.508154
21	9.407956	9.435366	9.461147	9.485484	9.508529
22	9.408427	9.435808	9.461564	9.485878	9.508903
23	9.408898	9.436250	9.461981	9.486272	9.509276
24	9.409368	9.436692	9.462397	9.486666	9.509649
25	9.409838	9.437133	9.462813	9.487059	9.510022
26	9.410307	9.437573	9.463228	9.487452	9.510395
27	9.410776	9.438014	9.463643	9.487844	9.510767
28	9.411244	9.438453	9.464058	9.488236	9.511139
29	9.411712	9.438893	9.464472	9.488628	9.511511
30	9.412179	9.439332	9.464886	9.489019	9.511882

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9,412179	9,439332	9.464886	9,489019	9,511882
31	9,412646	9,439770	9.465299	9,489411	9,512253
32	9,413112	9,440208	9.465712	9,489801	9,512624
33	9,413578	9,440646	9.466125	9,490192	9,512995
34	9,414043	9,441083	9.466537	9,490582	9,513365
35	9,414508	9,441520	9.466949	9,490971	9,513734
36	9,414972	9,441956	9.467360	9,491361	9,514104
37	9,415436	9,442392	9.467771	9,491750	9,514473
38	9,415899	9,442827	9.468182	9,492138	9,514942
39	9,416362	9,443262	9.468592	9,492527	9,515210
40	9,416824	9,443697	9.468992	9,492915	9,515579
41	9,417286	9,444131	9.469412	9,493302	9'515946
42	9,417747	9,444564	9.469821	9,493686	9,516314
43	9,418208	9,444997	9.470230	9,494076	9,516681
44	9,418668	9.445430	9.470638	9,494463	9,517048
45	9,419128	9.445863	9.471046	9,494849	9,517415
46	9,419588	9.446294	9.471454	9,495235	9,517781
47	9,420046	9.446726	9.471861	9,495620	9,518147
48	9,420505	9.447157	9,472268	9,496006	9,518513
49	9,420963	9.447588	6,472674	9,496390	9,518878
50	9,421420	9.448018	9,473080	9,496775	9,519243
51	9,421877	9.448448	9,473486	9,497159	9,519608
52	9,422333	9.448877	9,473891	9,497543	9,519973
53	9,422789	9.449306	9.474296	9,497926	9,520337
54	9,423245	9.449734	9,474701	9,498310	9,520701
55	9,423700	9.450163	9,475105	9,498692	9,521064
56	9,424154	9.450590	9,475509	9.499075	9,521428
57	9,424608	9.451017	9,475912	9,499457	9,521791
58	9,425062	9.451447	9.476315	9,499839	9,522153
59	9,425505	9.451871	9.476718	9,500220	9,522516
60	9,425968	9.452297	9.477120	9,500601	9,522878

D

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9,522878	9,544067	9,564270	9,583570	9.602059
1	9,523240	9,544412	9,564599	9,583890	9.602350
2	9,523601	9,544756	9,564928	9,584205	9.602662
3	9,523962	9,545100	9,565256	9,584515	9.602963
4	9,524323	9,545444	9,565584	9,584833	9.603264
5	9,524684	9,545787	9,565912	9,585146	9.663564
6	9,525044	9,546130	9,566240	9,585460	9.603865
7	9,525404	9,546473	9,566567	9,585773	9.604165
8	9,525763	9,546816	9,566895	9,586086	9.604465
9	9,526123	9,547158	9,567221	9,586399	9.604765
10	9,526482	9,547500	9,567548	9,586711	9.605065
11	9,526841	9,547842	9,567875	9,587024	9.605364
12	9,527199	9,548184	9,568201	9,587336	9.605663
13	9,527557	9,548525	9,568527	9,587648	9.605962
14	9,527915	9,548866	9,568852	9,587959	9.606261
15	9.528273	9,549207	9,569178	9,588271	9.606559
16	9,528630	9,549547	9,569503	9,588582	9.606858
17	9,528987	9,549887	9,569828	6,588893	9.607156
18	9,529344	9,550227	9,570153	9,589204	9.607454
19	9,529700	9,550567	9,570477	9,589514	9.607752
20	9,530056	9,550906	9,570801	9,589825	9.608049
21	9,530412	9,551246	9,571125	9,590135	9.608347
22	9,530768	9,551585	9,571449	9,590445	9.608644
23	9,531123	9.551923	9,571773	9,590754	9.608941
24	9,531478	9,552262	9,572096	9,591064	9.609238
25	9,531833	9,552600	9,572419	9,591373	9.609534
26	9,532187	9,552937	9,572742	9,591682	9.609830
27	9,532541	9,553275	9,573064	9,591991	9.610127
28	9.532895	9,553613	9,573386	9,592299	9.610423
29	9,533248	9,553949	9,573708	9,592607	9.610718
30	9,533602	9,554286	9,574030	9,592916	9.611014

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.533602	9.554286	9.574030	9.592916	9.611014
31	9.533955	9.554623	9.574352	9.593224	9.611309
32	9.534307	9.554959	9.574673	9.593531	9.611604
33	9.534660	9.555295	9.574994	9.593839	9.611899
34	9.535012	9.555631	9.575315	9.594146	9.612194
35	9.535363	9.555966	9.575636	9.594453	9.612489
36	9.535715	9.556302	9.575956	9.594760	9.612783
37	9.536066	9.556636	9.576276	9.595066	9.613077
38	9.536417	9.556971	9.576596	9.595373	9.613371
39	9.536768	9.557306	9.576916	9.595679	9.613665
40	9.537118	9.557640	9.577235	9.595985	9.613958
41	9.537468	9.557974	9.577555	9.596291	9.614252
42	9.537818	9.558307	9.577874	9.596596	9.614545
43	9.538168	9.558641	9.578192	9.596901	9.614838
44	9.538517	9.558974	9.578511	9.597206	9.615130
45	9.538866	9.559307	9.578829	9.597511	9.615423
46	9.539215	9.559640	9.579147	9.597816	9.615715
47	9.539563	9.559972	9.579465	9.598120	9.616007
48	9.539911	9.560304	9.579783	9.598425	9.616299
49	9.540259	9.560636	9.580100	9.598729	9.616591
50	9.540607	9.560968	9.580417	9.599033	9.616883
51	9.540954	9.561299	9.580734	9.599336	9.617174
52	9.541301	9.561630	9.581051	9.599640	9.617465
53	9.541648	9.561961	9.581367	9.599943	9.617756
54	9.541994	9.562292	9.581683	9.600246	9.618047
55	9.542340	9.562622	9.581999	9.600548	9.618338
56	9.542686	9.562952	9.582315	9.600851	9.618628
57	9.543032	9.563280	9.582630	9.601153	9.618918
58	9.543377	9.563612	9.582946	9.601455	9.619208
59	9.543722	9.563941	9.583261	9.601757	9.619598
60	9.544067	9.564270	9.583576	9.602059	9.619788

D 2

S.	25 Logarith	26 Logarith	27 Logarith	28 Logarith	29 Logarith
0	9.619788	9.636821	9.653212	9.669000	9.684246
1	9.620077	5.637099	9.653480	9.669264	9.684495
2	9.620366	9.637378	9.653747	9.669522	9.684745
3	9.620655	9.637655	9.654015	9.669781	9.684994
4	9.620944	9.637933	9.654283	9.670039	9.685243
5	9.621233	9.638211	9.654550	9.670296	9.685492
6	9.621521	9.638488	9.654817	9.670554	9.685741
7	9.621810	9.638758	9.655084	9.670812	9.685989
8	9.622198	9.639043	9.655351	9.671069	9.686238
9	9.622386	9.639319	9.655618	9.671326	9.686486
10	9.622673	9.639596	9.655884	9.671583	9.686735
11	9,622961	9.639873	9.656150	9.671840	9.686983
12	9.623248	9.640149	9.656417	9.672197	9.687231
13	9.623535	9.640425	9.656683	9.672353	9.687478
14	9.623822	9.640701	9,656949	9.672610	9.687726
15	9.624109	9.640977	9.657214	9.672866	9.687974
16	9.624396	9.641253	9.657480	9.673122	9.688221
17	9.624682	9.641528	9.657745	9.673378	9.688468
18	9.624968	9.641803	9.658010	9.673634	9.688715
19	9.625254	9,642079	9.658275	9.673890	9.688962
20	9.625540	9.642354	9.658540	9.674145	9.689209
21	9.625826	9.642628	9.658805	9.674401	9.689456
22	9.626111	9.642903	9.655070	9.674456	9.689702
23	9.626396	9.643177	9.659334	9.674911	9.689949
24	9.626681	9.643452	9.659598	9.675166	9.690195
25	9.626966	9.643726	9.659862	9.675421	9.690441
26	9.627251	9.644000	9.660126	9.675676	9.690687
27	9.627536	9.644273	9.660390	9.675930	9.690933
28	9.627820	9.644547	9.660654	9.676184	9.691179
29	9.628104	9.644820	9.660917	9.676439	9.691424
30	9.628388	9.645094	9.661180	9.676693	9.691670

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.628388	9.645094	9.661180	9.676693	9.691670
41	9.628672	9.645367	9.661444	9.676947	9.691915
32	9.628955	9.645640	9.661707	9.677200	9.692160
33	9.629249	9.645912	9.661969	9.677454	9.692405
34	9.629522	9.646185	9.662232	9.677707	9.692650
35	9.629805	9.646457	9.662494	9.677961	9.692895
36	9.630088	9.646729	9.662757	9.678214	9.693139
37	9.630370	9.647001	9.663019	9.678467	9.693384
38	9.630653	9.647273	9.663281	9.678720	9.693628
39	9.630935	9.647545	9.663543	9.678972	9.693872
40	9.631217	9.647816	9.663805	9.679225	9.694117
41	9.631499	9.648088	9.664066	9.679477	9.694360
42	9.631781	9.648359	9.664328	9.679730	9.694604
43	9.632062	9.648630	9.664589	9.679982	9.694848
44	9.632344	9.648901	9.664850	9.680234	9.695091
45	9.632625	9.649172	9.665111	9.680486	9.695335
46	9.632906	9.649442	9.665371	9.680737	9.695578
47	6.633187	9.649712	9.665632	9.680989	9.695821
48	9.633467	9.649983	9.665893	9.681240	9.696064
49	9.633748	9.650253	9.666153	9.681491	9.696307
50	9.634028	9.650522	9.666413	9.681743	9.696550
51	9.634308	9.650792	9.666673	9.681994	9.696792
52	9.634588	9.651062	9.666933	9.682244	9.697035
53	9.634868	9.651331	9.667192	9.682495	9.697277
54	9.635148	9.651600	9.667452	9.682746	9.697519
55	9.635427	9.951869	9.667711	9.682996	9.697761
56	9.635706	9.652138	9.667971	9.683246	9.698003
57	9.635985	9.652407	9.668230	9.783496	9.698245
58	9.636264	9.652675	9.668488	9.683746	9.698486
59	9.636543	9.652943	9.668747	9.683996	9.698728
60	9.636821	9.653212	9.669006	9.684246	9.698969

D 3

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.698969	9.713209	9.726998	9.740362	9,753327
1	9.699210	9.713443	9.727234	9.740581	9,753540
2	9.699451	9.713676	9.727450	9.740800	9,753752
3	9.699692	9.713909	9.727676	9.741019	9,753965
4	9.699933	9.714142	9.727902	9.741238	9.754177
5	9.700174	9.714375	9.728127	9.741457	9,754390
6	9.700414	9.714608	9.728353	9.741676	9,754602
7	9.700655	9.714841	9.728578	9.741894	9,754814
8	9.700895	9.715073	9.728804	9.742113	9,755026
9	9.701135	9.715306	9.729029	9.742331	9,755238
10	9.701375	9.715538	9.729254	9.742550	9,755450
11	9.701615	9.715770	9.729479	9.742768	9,755662
12	9.701855	9.716002	9.729704	9.742986	9,755874
13	9.702094	9.716234	9.729928	9.743204	9,756085
14	9.702334	9.716466	9.730153	9.743422	9,756297
15	9.702573	9.716698	9.730377	9.743639	9,756508
16	9.702812	9.716929	9.730602	9.743857	9,756720
17	9.703051	9.717161	9.730826	9.744075	9,756931
18	9.703290	9.717392	9.731050	9.744292	9,757142
19	9.703529	9.717623	9.731274	9,744500	9,757353
20	9.703768	9.717854	9.731598	9,644726	9,757564
21	9.704006	9.718085	9.731722	9,744944	9,757774
22	9.704245	9.718316	9.731946	9,745161	9,757985
23	9,704483	9.718547	9.732169	9,745377	9,758196
24	9.704721	9.718777	9.732393	9,745594	9.758406
25	9.704959	9.719008	9.732616	9,745811	9,758617
26	9.705197	9.719238	9.732839	9,746027	9, 58827
27	9.705435	9.719468	9.733062	9,746244	9, 59037
28	9.705673	9.719698	9.733285	9,746460	9,759247
29	9.705910	9.719928	9.733508	9,746676	9,75945
30	9.706148	9.720158	9.733731	9,746893	9,759667

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9,706148	9,720158	9,733731	9.746893	9.759667
31	9,706385	9,720388	9,733954	9.747109	9.759877
32	9,706622	9,720618	9,734176	9.747324	9.760086
33	9,706859	9,720847	9,734399	9.747540	9.760296
34	9,707096	9,721076	9,734621	9.747756	9.760505
35	9,707333	9,721306	9,734843	9.747972	9.760715
36	9,707569	9,721535	9,735065	9.748187	9.760924
37	9,707806	9,711764	9,735287	9.748402	9.761133
38	9,708042	9,721993	9,735509	9.748618	9.761342
39	9,708278	9,722221	9,735731	9.748833	9.761551
40	9,708514	9,722450	9,735953	9.749048	9.761760
41	9,708750	9.722679	9.736174	9.749263	9.761969
42	9,708986	9,722907	9.736396	9.749478	9.762177
43	9,709222	9,723135	9.736617	9.749692	9.762386
44	9,709457	9.723363	9.736838	9.749907	9.762594
45	9,709693	9,733591	9.737059	9.750122	9.762803
46	9,709928	9,723819	9.737280	9.750332	9.763011
47	9,710166	9,724047	9.737501	9.750550	9.763219
48	9,710398	9,724225	9.737722	9.750764	9.763427
49	9,710633	9,724502	9.737942	9.750979	9.763635
50	9,710868	9,724730	9.738163	9.751193	9.763843
51	9,711103	9,724957	9.738383	9.751406	9.764041
52	9,711337	9,725184	9.738603	9.751620	9.764258
53	9,711572	9,725401	9.738824	9.751834	9.764466
54	9,711806	9,725638	9.739044	9.752047	9.764673
55	9,712040	9,725865	9.739264	9.752261	9.764884
56	9,712274	9,726092	9.739483	9.752474	9.765088
57	9,712508	9,726319	9.739703	9.752688	9.765295
58	9,712742	9,726545	9.739923	9.752901	9.765502
58	9,712976	9,726771	9.740142	9.753114	9.765709
0	9.713209	9,726998	9.740362	9.753327	9.765916

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.765916	9.778150	9.790049	9.801631	9,812912
1	9.766123	9.778351	9.790237	9.801822	9.813098
2	9.766329	9.778552	9.790441	9.802012	9.813283
3	9.766536	9.778753	9.790636	9.802202	9.813469
4	9.766742	9.778954	9.790831	9.802393	9.813654
5	9.766949	9.779154	9.791027	9.802543	9.813839
6	9.767155	9.779355	9,791222	9.802773	9.814025
7	9.767361	9.779555	9.791417	9.802963	9.814210
8	9.767567	9.779766	9.791612	9.803153	9.814395
9	9.767773	9.779956	9.791807	9.803342	9.814580
10	9.767979	9.780156	9.792001	9.803531	9.814764
11	9.768185	9.780356	9.792196	9.803722	9.814949
12	9.768390	9.780556	9.792391	9.803911	9.815134
13	9.768596	9.780756	9.792585	9.804101	9.815318
14	9.768801	9.780956	9.792780	9,804290	9.815503
15	9.769007	9.781156	9.792974	5.804479	9.815687
16	9.769212	9.781355	9.793163	9.804668	9.816872
17	9.769417	9.781555	9.793362	9.804857	9.816056
18	9.769622	9.781754	9.793557	9.865047	9.816240
19	9.769827	9.781954	9.793751	9.805235	9.816424
20	9.770032	9.782153	9.793945	9.805424	9.816609
21	9.770237	9.782352	9.794138	9.805613	9.816792
22	9.770442	9.782551	9.794332	9.805802	9.816976
23	9.770646	9.782750	5.794526	9.805990	9.817206
24	9.770851	9.782949	9.794719	9.806189	9.817334
25	9.771055	9.783148	9.794913	9.806367	9.817528
26	9.771260	9.783347	9.795166	9.806556	9.817711
27	9.771464	9.783545	9.795300	9.806744	9.817895
28	9.771668	9.783744	9.795493	9.806932	9.818078
29	9.771872	9.783942	9.795686	9.807120	9.818262
30	9.772076	9.784141	9.795879	9.807308	9.818445

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9,772076	9.784141	9.795879	9.807308	9.818445
31	9,772280	9.784339	9.796072	9.807496	9.818628
32	9.772484	9.784537	9.796265	9.807684	9.818811
33	9.772687	9.784735	9.796458	9.807872	9.818994
34	9.772891	9.784933	9.796650	9.808060	9.819177
35	9.773094	9.785131	9.796843	9.808247	9.819360
36	9.773298	9.785329	9.797036	9.808435	9.819543
37	9.773501	9.785527	9.797228	9.808623	9.819726
38	9.773704	9.785724	9.797420	9.808810	9.819908
39	9.777907	9.785922	9.797613	9.808997	9.820091
40	9.774110	9.786119	9.797805	9.809184	9.820273
41	9.774313	9.786317	9.797997	9.809372	9.820456
42	9.774516	9.786514	9.798189	9.809559	9.820638
43	9.774719	9.786711	9.798381	9.809746	9.820821
44	9.774921	9.786908	9.798573	9.805933	9.821003
45	9.775124	9.787150	9.798765	9.810119	9.821185
46	9.775326	9.787302	9.798956	9.810306	9·821367
47	9.775529	9.787499	9.799148	9.810493	9.821549
48	9.775731	9.787696	9.799340	9.810679	9.821731
49	9.775933	9.787892	9.799531	9.810866	9.821913
50	9.776135	9.788089	9.799722	9.811052	9.822094
51	9.776337	9.788285	9.799914	9.811239	9.822276
52	9.776539	9.788482	9.800105	9.811425	9.822458
53	9.776741	9,788678	9.800296	9.811611	9.822639
54	9.776942	9.788874	9.800487	9.811797	9.822821
55	9.777144	9.789070	9.800678	9.811983	9.823002
56	9.777345	9.789266	9.800869	9.812169	9.823183
57	9.777547	9.789462	9.801060	9.812355	9.823365
58	9.777748	9.789658	9.801250	9.812541	9.823546
59	9·777949	9.789854	9.801441	9.812727	9.823727
60	9.778150	9.790049	9.801631	9.812912	9.823908

E

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.823908	9.834632	9,845097	9,855316	9.865300
1	9.824089	9.834808	9,845269	9,855485	9.865465
2	9.824270	9.834985	9,845442	9,855653	9.865629
3	9.824450	9.835161	9,845614	9,855821	9.865794
4	9.824631	9.835337	9,845786	9,855989	9.865958
5	9.824812	9.835513	9,845958	9,856157	9.866122
6	9.824992	9.835690	9.846130	9,856325	9.866286
7	9.825173	9.835866	9,846302	9,856493	9.866450
8	9.825353	9.836042	9,846474	9,856661	9.866614
9	9.825533	9.836218	9,846645	9,856829	9.866778
10	9.825714	9.836393	9,846817	9,856996	9.866942
11	9.825894	9.836569	9.846989	9,857164	9.867106
12	9.826074	9.836745	9,847100	9,857331	9.867270
13	9.826254	9.836921	9,847332	9,857499	9.867434
14	9.826434	9.837096	9,847504	9,857666	9.867597
15	9.826614	9.837272	9,847674	9,857834	9.867761
16	9.826793	9.837447	9,847846	9,858001	9.867925
17	9.826973	9.837623	9,848017	9,858168	9.868088
18	9.827153	9.837798	9,848188	9,858336	9.868251
19	9.827332	9.837973	9,848359	9 858503	9.868415
20	9.827512	9.838148	9,848530	9,858670	9.868578
21	9.827691	9.838323	9,848701	9,858837	9.868741
22	9.827871	9.838498	9,848872	9.859004	9.868905
23	9.828050	9.838673	9,849043	9,859171	9.869068
24	9.828229	9.838848	9,849213	9,859337	9.869231
25	9,828408	9,839023	9,849384	9,859504	9.869394
26	9.828587	9,839198	9,849555	9,859671	9.869557
27	9.828766	9,839372	9,849725	9,859838	9.869720
28	9.828935	9.839547	9,849896	9,860004	9.869882
29	9.829124	9,839721	9,850066	9,860171	9.870045
30	9.829303	9.839896	9,850237	9,860337	9.870208

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.829303	9.839896	9.850237	9.860337	9.870208
31	9.829481	9.840070	9.850407	9.860503	9.870370
32	9.829660	9.840245	9.850577	9.860670	9.870533
33	9.829839	9.840419	9.850747	9.860836	9.870695
34	9.830017	9.840593	9.850917	9.861002	9.870858
35	9.830195	9.840767	9.851087	9.861168	9.871020
36	9.830374	9.840941	9.851257	9.861334	9.871183
37	9.830552	9.841115	9.851427	9.861500	9.871345
38	9.830730	9.841289	9.851597	9.861666	9.871507
39	9.830908	9.841463	9.851767	9.861832	9.871669
40	9.831086	9.841637	9.851936	9.861998	9.871831
41	9.831264	9.841810	9.852106	9.862164	9.871993
42	9.831442	9.841984	9.852276	9.862329	9.872155
43	9.831620	9.842157	9.852445	9.862495	9.872317
44	9.831790	9.842331	9.852615	9.862660	0.872479
45	9.831975	9.842504	9.852784	9.862826	9.872641
46	9.832153	9.842678	9.852953	9.862991	9.872803
47	9.832330	9.842851	9.853122	9.863157	9.872964
48	9.832508	9.843024	9.853292	9.863322	9.873126
49	9.832685	9.843197	9.853461	9.863487	9.873287
50	9.832863	9.843370	9.853630	9.863652	9.873449
51	9.833040	9.843543	9.853899	9.863817	9.873610
52	9.833217	9.843716	9.853967	9.863982	9.873772
53	9.833394	9.843889	9.854136	9.864147	9.873933
54	9.833571	9.844062	9.854305	9.864312	9.874094
55	9.833748	9.844234	9.854474	9.864477	9.874255
56	9.833925	9.844407	9.854642	9.864642	9.874416
57	9.834102	9.844580	9.854811	9.864807	9.874577
58	9.834278	9.844752	9.854979	9.864971	0.874738
59	9.834455	9.844925	9.855148	9.865136	9.874899
60	9.834632	9.845097	9.855316	9.865300	9.875060

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.875060	9.884606	9.893946	9.903089	9,912044
1	9.875221	9.884763	9.894100	9.903240	9,912192
2	9.875382	9.884920	9.894254	9.903390	9,912339
3	9.875543	9.885077	9.894407	9.903541	9,912487
4	9.875703	9.885235	9.894561	9.603692	9,912634
5	9.875864	9.885392	9.894715	9.903842	9,912782
6	9.876024	9.885549	9.894869	9.903993	9,912929
7	9.876185	9.885706	9.895022	9,904143	9,913077
8	9.876345	9.885863	9.895176	9.904294	9,913224
9	9.876506	9.886019	9.895329	9.904444	9,913371
10	9.876666	9.886176	9.895483	9.904594	9,913519
11	9.876826	9.886333	9.895636	9.904745	9,913666
12	9.876986	9.886490	9.895790	9.904895	9,913813
13	9.877146	9.886646	9.895943	9.905045	9,913960
14	9.877306	9.886803	9.896096	9.905195	9,914107
15	9.877466	9.886959	9.896250	9.905345	9,914254
16	9.877626	9.887116	9.896403	9.905495	9,914401
17	9.877786	9.887272	9.896556	9.905645	9,914548
18	9.877946	9.887429	9.896709	9.905795	9,914695
19	9.878106	9.887585	9.896862	9.905945	9,914841
20	9.878265	9.887741	9.897015	9.906094	9,914988
21	9.878425	9.887897	9.897168	9.906244	9,915135
22	9.878585	9.888054	9.897321	9.906394	9,915282
23	9.878744	9.888210	9.897473	9.906544	9,915428
24	9.878904	9.888366	9.897626	9.906693	9,915575
25	9.879063	9.888522	9.897779	9.906843	9,915721
26	9.879222	9.888678	9.897931	9.906992	9,915868
27	9.879382	9.888833	9.898084	9.907142	9,916014
28	9.879541	9.888989	9.898236	9.907291	9,916160
29	9.879700	9.889145	9.898389	9.907440	9,916307
30	9.879859	9.889301	9.898541	9.907589	9,616453

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.879859	9.889301	9,898541	9,907589	9.916453
31	9.880018	9.889456	9,898694	9,907739	9.916599
32	9.880177	9,889612	9,898846	9,907888	9.916745
33	9,880336	9,889767	9,898998	9,908037	9.916891
34	9,880495	9.889923	9,899150	9,908186	9.917037
35	9.880654	9,890078	9,899303	9,908335	9.917183
36	9.880813	9.890234	9,899455	9,908484	9.917329
37	9.880971	9,890389	9.899607	9,908633	9.917475
38	9.881130	9,890544	9,899759	9.908782	9.917621
39	9.881289	9,890699	9,899911	9,908931	9.917767
40	9.881447	9,890855	9,900063	9,909079	9.917913
41	9.881606	9,891010	9,900214	9,909228	9.918058
42	9.881764	9,891165	9,900366	9,909377	9,918204
43	9.881922	9,891320	9,900518	9,909525	9.918350
44	9.882081	9,891475	9,900670	9,909674	9.918495
45	9.882239	9,891629	9.900821	9,909822	9.918641
46	9,882497	9,891784	9,900973	9,909971	9.918786
47	9,882555	9,891939	9,901124	9,910119	9.918932
48	9,882713	9,892094	9.901276	9.910268	9.919077
49	9,882871	9,892248	9.901427	9,910416	9.919222
50	9,883029	9.892403	9,901578	9,910564	9.919368
51	9,883187	9,892557	9,901730	9.910712	9.919513
52	9.883345	9,892712	9.901881	9.910860	9.919658
53	9.883503	9,892866	9,902032	9,911009	9.919803
54	9,883660	9.893021	9,902183	9.911157	9.919948
55	9,883818	9,893175	9.902334	9,911305	9.920093
56	9,883976	9,893329	9,902485	9.911453	9.920238
57	9.884133	9,893483	9,902636	9.911600	9.920383
58	9,884291	9.893637	9,902787	9.911748	9.920528
59	9.884448	9,893792	9,902938	9.911896	9.920673
60	9.884606	9.893946	9,903089	9,912040	9.920818

E 3

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9,920818	9.929418	9,937851	9,946124	9,954242
1	9.920962	9.929560	9,937990	9,946260	9,954370
2	9,921107	9.929702	9,938129	9,946397	9,954510
3	9,921252	9.929843	9,938268	9,946533	9,954643
4	9.921396	9.929985	9,938408	9,946670	9,954777
5	9,921541	9,930127	9,938547	9,946806	9,954911
6	9,921685	9,930269	9,938685	9,946942	9,955045
7	9,921830	9,930410	9,938824	9,947079	9,955179
8	9.921974	9,930552	9,938963	9,947215	9,955313
9	9,922119	9,930693	9,939102	9,947351	9,955446
10	9,922263	9,930835	9,939241	9,947487	9,955580
11	9.922407	9,930976	9,939380	9,947623	9,955713
12	9,922551	9,931118	9,939518	9,947759	9,955847
13	9,922696	9,931259	9,939657	9,947895	9,955981
14	9.922840	9,931400	9,939795	9.948031	9.956114
15	9,922984	9,931542	9,939934	9.948167	9.956247
16	9,923128	9,931683	9,940073	9.948303	9,956381
17	9.923272	9,931824	9,940211	9.948439	9.956514
18	9.923416	9,931965	9,940349	9.948575	9.956648
19	9.923560	9,932106	9,940488	9.948711	9.956781
20	9.923703	9,932247	9,940626	9.948846	9.956914
21	9.923847	9,932388	9,940764	9.948982	9.957047
22	9,923991	9,932529	9,940903	9.949118	9.957180
23	9,924135	9,932670	9,941041	9.949253	9.957314
24	9,924278	9,932811	9,941179	9.949389	9.957447
25	9,924422	9,932952	9,941317	9,949525	9.957580
26	9,924565	9,933092	9,941455	9.949660	9,957713
27	9,924709	9,933233	9,941593	9.949795	9.957846
28	9,924852	9,933374	9,941731	9.949931	9.957979
29	9,924996	9,933514	9,941869	9.950066	9.958111
30	9,925139	9,933655	9,942007	9.950202	9.958244

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.925139	9.933655	9.942007	9.950202	9.958244
31	9.925282	9.933796	9.942145	9.950337	9.958377
32	9.925426	9.933936	9.942283	9.950472	9.958510
33	9.925569	9.934076	9.942420	9.950607	9.958643
34	9.925712	9.934217	9.942558	9.950742	9.958775
35	9.925855	9.934357	9.942696	9.950877	9.958908
36	9.925998	9.934497	9.942833	9.951013	9.959030
37	9.926141	9.934638	9.942971	9.951148	9.959173
38	9.926284	9.934778	9.943109	9.951283	9.959305
39	9.926427	9.934918	9.943246	9.951417	9.959438
40	9.926570	9.935058	9.943384	9.951552	9.959570
41	9.926713	9.935198	9.943521	9.951687	9.959703
42	9.926856	9.935338	9.943658	9.951822	9.959835
43	9.926998	9.935478	9.943796	9.951957	9.959967
44	9.927141	9.935618	9.943933	9.952092	9.960100
45	9.927284	9.935758	9.944070	9.952226	9.960232
46	9.927426	9.935898	9.944207	9.952361	9.960364
47	9.927569	9.936038	9.944345	9.952495	9.960496
48	9.927711	9.936178	9.944482	9.952630	9.960628
49	9.927854	9.936317	9.944619	9.952765	9.960760
50	9.927996	9.936457	9.944756	9.952899	9.960892
51	9.928139	9.936597	9.944893	9.953033	9.961024
52	9.928281	9.936736	9.945030	9.953168	9.961156
53	9.928423	9.936876	9.945167	9.953302	9.961288
54	9.928566	9.937015	9.945303	9.953437	9.961420
55	9.928708	9.937155	9.945440	9.953571	9.961552
56	9.928850	9.937294	9.945577	9.953705	9.961684
57	9.928992	9.937433	9.945714	9.953839	9.961815
58	9.929134	9.937573	9.945850	9.953973	9.961947
59	9.929276	9.937712	9.945987	9.954107	9.962079
60	9.929418	9.937851	9.946124	9.954242	9.962210

S.	Logarith	Logarith	Logarith	Logarith	Logarith
0	9.962210	9,970036	9,977723	9.985276	9.992700
1	9.962342	9,970165	9,977850	9.985401	9,992822
2	9.962474	9,970294	9,977977	9.985525	9.992945
3	9.962605	9,970423	9,978103	9.985650	9.993068
4	9.962737	9,970552	9,978230	9.985775	9.993190
5	9.962868	9,970682	9,978357	9,985899	9.993313
6	9,962999	9,970811	9,978484	9,986024	9.993435
7	9.963131	9,970940	9,978611	9,986148	9.993558
8	9.963262	9,971069	9,978737	9,986273	9.993680
9	9.963393	9,971198	9,978864	9,986497	9.993802
10	9.963524	9,971316	9,978991	9,986522	9.993925
11	9.963656	9.971455	9,979117	9,986646	9.994047
12	9.963787	9,971584	9,979244	9,986771	9.994169
13	9.963918	9,971713	9,979370	9,986895	9.994292
14	9.964049	9,971842	9,979497	9,987019	9.994414
15	9.964180	9,971970	9,979623	9,987144	9.994536
16	9.964311	9,972099	9,979750	9,987268	9.994658
17	9.964442	9,972228	9,979876	9,987392	9.994780
18	9.964573	9.972356	9,980002	9,987516	9.994902
19	9.964704	9,972485	9,980129	9,987640	9,995024
20	9.964835	9,972613	9,980255	9,987765	9.995146
21	9.964965	9,972742	9,980381	9,987889	9.995268
22	9.965096	9,972870	9,980507	9,988013	9.995390
23	9.965227	9.972998	9,980634	9,988137	9.995512
24	9.965358	9,973127	9.980760	9,988261	9.995634
25	9.965488	9,973255	9.980886	9,988385	9.995756
26	9.965619	9,973383	9.981012	9,988508	9.995878
27	9.965749	9,973512	9.981138	9,988632	9.996000
28	0.965880	9,973640	9.981264	9,988756	9.996121
29	9.966009	9,973768	9.981390	9,988880	9.996243
30	9.966141	9,973896	9,981516	9,989004	9.996365

S.	Logarith	Logarith	Logarith	Logarith	Logarith
30	9.966141	9.973896	9.981516	9.989004	9.996365
31	9.966271	9.974024	9.981641	9.989127	9.996486
32	9.966401	9.974152	9.981767	9.989251	9.996608
33	9.966532	9.974280	9.981893	9.989375	9.996730
34	9.966662	9.974408	9.982019	9.989598	9.996851
35	9.966792	9.974536	9.982145	9.989622	9.996973
36	9.966923	9.974664	9.982270	9.989745	9.997094
37	9.967053	9.974792	9.982396	9.989869	9.997215
38	9.967183	9.974920	9.982521	9.989992	9.997337
39	9.967313	9.975048	9.982647	9.990116	9.997458
40	9.967443	9.975175	9.982773	9.990239	9.997580
41	9.967573	9.975303	9.982898	9.990363	9.997701
42	9.967703	9.975431	9.983024	9.990486	9.997822
43	9.967833	9.975558	9.983149	9.990609	9.997943
44	9.967963	9.975686	9.983274	9.990732	9.998065
45	9.968093	9.975814	9.983400	9.990856	9.998186
46	9.968222	9.975941	9.983525	9.990979	9.998307
47	9.968352	9.976069	9.983650	9.991102	9.998428
48	9.968482	9.976196	9.983776	9.991225	9.998549
49	9.968612	9.976324	9.983901	9.991348	9.998670
50	9.968741	9.976451	9.984026	9.991471	9.998791
51	9.968871	9.976578	9.984151	9.991594	9.998912
52	9.969001	9.976706	9.984276	9.991717	9.999033
53	9.969130	9.976833	9.984401	9.991840	9.999154
54	9.969260	9.976960	9.984526	9.991963	9.999275
55	9.969389	9.977087	9.984651	9.992086	9.999395
56	9.969518	9.977214	9.984776	9.992209	9.999516
57	9.969648	9.977341	9.984901	9.992322	9.999637
58	9.969777	9.977469	9.985026	9.992454	9.999758
59	9.969907	9.977596	9.985151	9.992577	9.999878
60	9.970036	9.977723	9.985276	9.992700	1,000000

F

S.	Logarithm	Logarithm	Logarithm	Logarithm	Logarithm
0	10.000000	10,007178	10,014239	10,021188	10.028028
1	10.000120	10,007296	10,014356	10,021303	10.028141
2	10.000240	10,007415	10,014473	10,021418	10.028254
3	10.000361	10,007533	10,014590	10,021533	10.028367
4	10.000481	10,007652	10,014706	10,021648	10.028470
5	10.000602	10,007770	10,014823	10,021762	10.028593
6	10.000722	10,007889	10,014939	10,021877	10.028706
7	10.000843	10,008007	10,015056	10,021992	10.028819
8	10.000963	10,008126	10,015172	10,022106	10.028932
9	10,001093	10,008244	10,015289	10,022221	10.029044
10	10,001204	10,008363	10,015405	10,022336	10.029157
11	10,001324	10,008481	10,015522	10,022450	10.029270
12	10,001444	10,008559	10,015638	10,022565	10.029383
13	10,001564	10,008717	10,015754	10,022679	10.029496
14	10,001685	10,008836	10,015871	10,022794	10.029608
15	10,001805	10,008954	10,015987	10,022908	10.029721
16	10,001925	10,009072	10,016103	10,023023	10.029834
17	10,002045	10.009190	10,016220	10,023177	10.029946
18	10,002165	10,009308	10,016336	10,023251	10.030059
19	10,002285	10,009426	10.016452	10,023366	10.030171
20	10,002405	10,009544	10,016568	10,023480	10.030284
21	10,002525	10,009662	10,016684	10,023594	10.030396
22	10,002645	10,009780	10,016800	10,023709	10.030509
23	10,002765	10,009898	10,016916	10,023823	10.030621
24	10,002885	10,010006	10,017032	10,023937	10.030734
25	10,003005	10,010134	10,017148	10,024051	10,030846
26	10,003124	10,010252	10.017264	10,024165	10.030958
27	10.003244	10,010370	10,017380	10,024279	10.031071
28	10,003364	10,010487	10,017496	10,024393	10.031183
29	10.003483	10,010605	10,017612	10,024507	10.031295
30	10,003603	10,010723	10,017728	10,024622	10,031407

S.	Logarithm	Logarithm	Logarithm	Logarithm	Logarithm
30	10.003603	10.010723	10.017728	10.024622	10.031407
31	10.003723	10,010841	10.017844	10.024735	10.031520
32	10.003842	10.010958	10.017959	10.024849	10.031632
33	10.003962	10.011076	10.018075	10.024963	10,031744
34	10,004081	10.011193	10.018191	10.025077	10.031850
35	10.004201	10.011311	10.018306	10.025191	10.031963
36	10,004320	10.011428	10.018422	10.025305	10.032080
37	10.004440	10.011546	10.018538	10.025419	10.032192
38	10,004559	10.011663	10.018653	10.025532	10,032302
39	10.004679	10.011781	10.018769	10,025646	10.032410
40	10.004798	10.011898	10.018884	10.025760	10.032528
41	10.004917	10.012016	10.019000	10.025874	10,032640
42	10.005036	10.012133	10.019115	10,025987	10.032752
43	10.005156	10,012250	10.019231	10.026101	10,032864
44	10,005275	10.012367	10,019346	10.026214	10.032976
45	10.005394	10.012485	10.019461	10,026328	10.033088
46	10.005513	10.012602	10.019577	10.026441	10.033199
47	10,005632	10.012719	10.019692	10,026555	10,033311
48	10.005751	10.012836	10.019807	10.026668	10,033423
49	10.005870	10.012953	10.019923	10.026782	10.033534
50	10,005989	10.013070	10.020038	10.026895	10,033646
51	10,006108	10.013187	10.020153	10.027009	10,033758
52	10.006227	10.013304	10.020278	10.027122	10.033869
53	10.006346	10.013421	10.020383	10.027235	10.033981
54	10.006465	10.013538	10.020498	10.027349	10,034092
55	10.006584	10.013655	10.020603	10,027462	10,034204
56	10.006703	10.013772	10.020728	10.027575	10.034315
57	10.006821	10.013889	10.020843	10.097688	10,034427
58	10.006940	10.014006	10.020958	10.027801	10,034538
59	10.007059	10.014123	10.021073	10.027915	10,034650
60	10.007178	10.014239	10.021188	10.028028	10,034761

S.	1 Deg. 5 Logarithm	1 Deg. 6 Logarithm	1 Deg. 7 Logarithm	1 Deg. 8 Logarithm	1 Deg. 9 Logarithm
0	10,034761	10.041392	10.046923	10.053357	10.059697
1	10,034872	10.041501	10.047031	10,053463	10.059802
2	10,034984	10.041611	10.047139	10.053570	10.059907
3	10,035095	10.041721	10.047247	10.053676	10.061011
4	10.035206	10.041830	10.047354	10,053782	10.061116
5	10,035318	10.041940	10.047462	10.053889	10.061221
6	10,035429	10.042049	10.047570	10,053995	10.061326
7	10,035540	10.042159	10.047678	10.054101	10.061431
8	10.035651	10.042268	10.047786	10,054207	10,061535
9	10,035762	10.042378	10.047894	10.054314	10,061640
10	10.035873	10.042487	10.048002	10.054420	10.061745
11	10.035984	10.042596	10.048109	10,054526	10.061849
12	10,036095	10.042706	10.048217	10.054632	10.061954
13	10,036206	10.042815	10.048315	10,054738	10.062058
14	10.036317	10.042924	10.048432	10,054844	10.062163
15	10,036428	10.043034	10.048540	10.054950	10.062268
16	10.036539	10.043143	10.048648	10.055056	10.062372
17	10.036650	10.043252	10.048755	10.055162	10,062477
18	10.036761	10.043361	10,048863	10.055268	10.062581
19	10.036871	10.043470	10.048970	10.055374	10.062685
20	10.036983	10.043580	10.049078	10,055480	10.062790
21	10.037093	10.043689	10.049185	10.055586	10,062894
22	10.037204	10.043798	10.049293	10.055692	10.062999
23	10.037315	10.043907	10.049400	10.055798	10,063103
24	10.037425	10.044016	10.049508	10.055904	10.063207
25	10.037536	10.044125	10,049615	10.056010	10.063312
26	10,037647	10.044234	10.049722	10,056115	10.063416
27	10.037757	10.044343	10.049830	10.056221	10,063520
28	10.037868	10.044452	10.049937	10.056327	10.063624
29	10.037979	10.044561	10,050044	10.056433	10,063728
30	10.038089	10.044669	10.050152	10.056538	10.063833

S.	Logarithm	Logarithm	Logarithm	Logarithm	Logarithm
30	10.038089	10,044669	10.050152	10.056538	10.063833
31	10.038200	10,044778	10.050259	10,056644	10.063937
32	10.038310	10.044887	10,050366	10,056750	10.064041
33	10.038420	10.044996	10,050473	10.056855	10,064145
34	10,038531	10,044105	10.050580	10.056961	10.064249
35	10,038641	10,044213	10.050687	10,057066	10.064353
36	10,038752	10,044322	10.050794	10,057172	10.064457
37	10.038862	10,044431	10.050902	10.057277	10.064561
38	10.038972	10,044539	10,051009	10.057383	10.064665
39	10,039082	10,044648	10,051116	10.057488	10.064769
40	10,039193	10,044756	10,051223	10,057594	10.064873
41	10,039303	10.044865	10,051329	10.057699	10.064977
42	10.039413	10.044974	10.051436	10,057804	10.065081
43	10.039523	10.045082	10,051543	10,057910	10.065184
44	10,039633	10,045191	10.051650	10.058015	10.065288
45	10.039744	10.045299	10.051757	10.058120	10,065392
46	10.039854	10,045407	10.051864	10,058226	10.065496
47	10,039964	10.045516	10.051971	10.058331	10,065599
48	10.040074	10.045624	10.052077	10.058436	10,065703
49	10.040184	10.045733	10.052184	10,058541	10.065807
50	10.040294	10.045841	10,052291	10.058647	10.065911
51	10,040404	10,045949	10,052398	10.058752	10.066014
52	10.040513	10.046057	10,052504	10.058857	10,066118
53	10,040623	10,046166	10.052611	10,058962	10.066221
54	10,040733	10.046274	10.052718	10.059067	10.066325
55	10,040843	10.046382	10.052824	10.059172	10.066428
56	10.040953	10.046490	10.052931	10.059277	10.066532
57	10.041063	10.046598	10.053037	10.059382	10.066635
58	10,041172	10.046706	10.053144	10.059487	10.066739
59	10,041282	10.046815	10,053250	10.059592	10.066842
60	10,041392	10.046923	10.053357	10.059697	10.066946

F 3

S.	Logarithm	Logarithm	S.	Logarithm	Logarithm
0	10,066946	10,073106	30	10.070037	10.076154
1	10.067049	10,073208	31	10.070140	10.076255
2	10.067153	10,073310	32	10.070242	10.076356
3	10,067256	10.073412	33	10.070345	10.076457
4	10,067359	10.073514	34	10 070447	10.076559
5	10.067463	10,073616	53	10,070550	10,076660
6	10.067566	10,073717	36	10.070652	10.076761
7	10.067669	10,073819	37	10.070755	10.076862
8	10.067772	10,073921	38	10,070857	10.076963
9	10.067875	10.074023	39	10,070950	10.077064
10	10.067979	10,074124	40	10.071062	10.077165
11	10.068082	10.074226	41	10.071265	10.077206
12	10.068185	10,074328	42	10,071267	10.077367
13	10.068288	10,074429	43	10.071370	10.077468
14	10,068391	10.074531	44	10.071472	10,077569
15	10.068494	10.074633	45	10.071574	10,077670
16	10,068597	10.074734	46	10.071676	10.077771
17	10,068700	10.074836	47	10.071779	10,077871
18	10,068803	10.074937	48	10,071881	10.077972
19	10.068906	10.075039	49	10.071983	10.078073
20	10.069009	10.075130	50	10.072085	10.078174
21	10.069112	10.075242	51	10.072188	10.078275
22	10,069215	10.075343	52	10.072290	10.078375
23	10,069318	10.075445	53	10.072392	10.078476
24	10,069410	10.075546	54	10,072494	10.078577
25	10.069513	10.075647	55	10.72596	10.078677
26	10,069626	10.075749	56	10.072698	10.078778
27	10.069729	10.075850	57	10.072800	10.078879
28	10.069831	10,075951	58	10.072902	10.078979
29	10.069934	10.076053	56	10.073004	10.079080
30	10.076037	10,076154	60	10.073106	10,079180

Primum Mobile:

Or

Tables shewing the Declinations, Right Ascentions, Ascentional Differences, Oblique Ascentions of the Sun, and other Planets.

With other *TABLES,*

For the more speedy erecting of a FIGURE, and finding the *Arke of Direction.*

Primum Mobile:

or

Tables shewing the Decli-
nations, Right Ascensions, Ascen-
sional Differences, Oblique Ascensions of the
Sun, and other Planets.

With other TABLES,

For the more speedy erect-
ing of a FIGURE, and fur-
thering the Art of Direction.
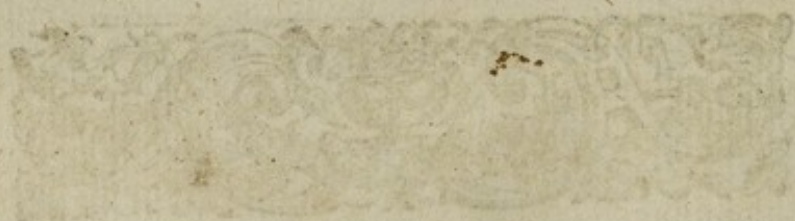
A Table for converting *Hours* and *Min.* into *Deg.* and *Min.* of the *Equator*

Hor.	Deg. Equator.	Min.	Deg.and Min Equa.		Min.	Deg and Min Eq.	
	15	1	0	15	31	7	45
2	30	2	0	30	32	8	0
3	45	3	0	45	33	8	15
4	60	4	1	0	34	8	30
5	75	5	1	15	35	8	45
6	90	6	1	30	36	9	0
7	105	7	1	45	37	9	15
8	120	8	2	0	38	9	30
9	135	9	2	15	39	9	45
10	150	10	2	30	40	10	0
11	165	11	2	45	41	10	15
12	180	12	3	0	42	10	30
13	195	13	3	15	43	10	45
14	210	14	3	30	44	11	0
15	225	15	3	45	45	11	15
16	240	16	4	0	46	11	30
17	255	17	4	15	47	11	45
18	270	18	4	30	48	12	0
19	285	19	4	45	49	12	15
20	300	20	5	0	50	12	30
21	315	21	5	15	51	12	45
22	330	22	5	30	52	13	0
23	345	23	5	45	53	13	15
24	360	24	6	0	54	13	30
		25	6	15	55	13	45
		26	6	30	56	14	0
		27	6	45	57	14	15
		28	7	0	58	14	30
		29	7	15	59	14	45
		30	7	30	60	15	0

G

A Table.

| ♈ North Latitude. | | | | | | ♎ South Latitude | |
♈	0	1	2	3	4	5	6	♎
00	0. 0	0. 55	1. 50	2. 45	3. 40	4, 35	6. 00	30
1	0. 24	1, 19	2. 14	3. 09	4, 04	4. 59	6, 12	29
2	0, 48	1. 43	2. 38	3. 33	4, 28	5, 23	6. 18	28
3	1. 12	2. 07	3. 02	3. 57	4. 52	5. 47	6. 42	27
4	1. 36	2, 31	3. 26	4. 21	5. 16	6. 11	7. 6	26
5	2, 00	2. 55	3. 50	4. 45	5, 50	6, 35	7. 30	25
6	2. 24	3. 19	4. 14	5. 09	6, 04	6. 59	7. 53	24
7	2. 47	3. 47	4. 38	5. 33	6. 28	7. 23	8. 17	23
8	3. 11	4. 07	5, 02	5. 57	6. 52	7. 47	8, 41	22
9	3. 35	4. 30	5. 25	6. 20	7. 15	8. 10	9, 5	21
10	3, 58	4, 54	5. 48	6. 44	7. 39	8. 34	9. 29	20
11	4. 22	5. 18	6. 12	7, 08	8. 03	8. 58	9. 53	19
12	4. 46	5. 42	6. 36	7. 32	8, 27	9. 22	10,16	18
13	5. 09	6. 05	7. 0	7. 55	8. 50	9. 46	10.40	17
14	5. 33	6. 29	7. 24	8. 19	9. 14	10.10	11. 4	16
15	5. 56	6, 52	7. 47	8. 42	9. 37	10,33	11.27	15
16	6, 19	7. 14	8, 09	9, 05	10, 0	10,50	11.51	14
17	6. 42	7. 37	8. 32	9. 28	10.23	11.19	12.14	13
18	7. 05	8, 0	8, 56	9, 51	10.46	11.42	12.37	12
19	7, 28	8. 23	9. 18	10,14	11.09	12.05	13. 0	11
20	7. 51	8. 46	9 ,42	10.38	11,33	12,28	13,23	10
21	8. 13	9. 05	10.09	11.01	11.56	12.51	13.46	9
22	8. 36	9, 32	10.28	11.23	12.19	13.14	14,09	8
23	8. 58	9.. 55	10.51	11,46	12,42	13.37	14.32	7
24	9. 21	10,17	11,13	12,08	13.04	14,00	14.54	6
25	9, 43	10,39	11.35	12.30	13,26	14.22	15,17	5
26	10. 5	11.01	11.57	12.52	13,48	14,44	15.39	4
27	10.26	11,23	12.19	13,14	14.10	15.06	16.01	3
28	10.48	11.45	12,41	13,36	14.32	15.28	16.23	2
29	11,09	12.05	13.02	13,57	14.53	15.49	16. 5	1
30	11.31	12.27	13.23	14,19	15.15	16.11	17,06	0

| ♓ South Latitude | | | | ♍ North Latitude. | | | | |

		♈ South Latitude			♎ North Latitude.			
♈	0	1	2	3	4	5	6	♎
0		0. 55	1. 50	2, 45	3. 40	4. 35	5. 30	30
1		0. 31	1, 27	2, 21	3. 16	4. 11	5. 06	29
2		0. 07	1, 03	1. 57	2, 52	3, 47	4. 42	28
3		0. 17	0. 39	1. 34	2, 29	3. 24	4. 19	27
4		0. 41	0. 15	1. 10	2, 05	3, 00	3. 55	26
5		1. 05	0, 09	0, 46	1. 41	2. 36	3. 31	24
6		1. 28	0, 33	0. 22	1. 17	2. 02	3. 07	23
7		1, 52	0, 57	0 02	0. 53	1. 48	2. 43	22
8		2. 16	1. 21	0. 26	0, 29	1, 25	2. 20	22
9		2, 29	1. 44	0, 49	0. 06	1. 02	1. 57	20
10		3. 03	2, 08	1. 13	0. 18	0. 38	1. 33	19
11		3. 27	2, 32	1, 37	0, 41	0. 14	1. 09	18
12		3. 51	2. 56	2. 01	1, 04	0. 10	0. 46	17
13		4, 14	3. 19	2, 24	1. 28	0. 33	0. 23	16
14		4. 37	3, 41	2, 57	1. 52	0. 56	0. 00	15
15		5. 00	4. 05	3. 10	2. 15	1. 19	0. 23	14
16		5. 23	4. 28	3. 32	2, 38	1. 41	0. 4	13
17		5. 46	4, 51	3. 55	3, 00	2. 04	1. 09	12
18		6, 09	5. 14	4. 18	3. 23	2. 27	1. 32	11
19		6. 32	5. 37	4. 41	3. 46	2. 50	1. 55	10
20		6, 55	5. 59	5. 04	4, 08	3. 12	2. 17	9
21		7. 17	6. 21	5. 27	4. 30	3, 34	2. 39	8
22		7. 40	6, 44	5. 50	4, 53	3, 57	3. 01	7
23		8. 03	7. 07	6, 12	5. 15	4. 19	3. 23	6
24		8. 25	7. 30	6, 34	5. 38	4. 42	3. 45	5
25		8. 47	7. 52	6. 56	6. 00	5. 04	4. 07	4
26		9, 09	8. 14	7. 18	6, 22	5. 26	4. 29	3
27		9. 31	8, 35	7. 50	6, 43	5. 47	4. 50	2
28		09. 53	8. 57	8. 01	7, 04	6. 08	5. 11	2
29		10. 14	9. 18	8. 22	7. 25	6. 29	5. 32	1
30		10, 35	9. 39	8. 43	7. 46	6. 50	5. 53	0

Taurus *North Latitude.*   Scorpio *South Latitude.*

♉	0	1	2	3	4	5	6	♏
0	11. 31	12, 27	13. 23	14. 19	15, 15	16. 11	17. 06	30
1	11. 52	12, 48	13. 44	14, 40	15, 36	16. 33	17. 28	29
2	12, 13	13. 09	14. 05	15, 01	15. 57	16. 54	17. 49	28
3	12. 33	13, 29	14. 25	15, 21	16, 18	17. 14	18, 10	27
4	12, 54	13. 50	14. 47	15, 42	16, 39	17. 35	18, 31	26
5	13, 14	14. 11	15, 07	16. 03	17, 00	17, 56	18, 52	25
6	13, 34	14. 31	15. 27	16. 24	17. 20	18, 17	19, 12	24
7	13. 54	14. 51	15. 47	16. 44	17. 40	18, 35	19, 32	23
8	14. 14	15. 11	16. 07	17. 04	18. 00	18, 57	19, 52	22
9	14, 33	15, 30	16. 26	17, 23	18. 20	19, 17	20. 12	21
10	14. 52	15. 49	16, 45	17. 42	18, 39	19, 36	20. 32	20
11	15. 11	16. 08	17. 04	18, 01	18, 58	19, 55	20, 51	19
12	15. 29	16, 26	17. 23	18. 20	19. 17	20. 14	21. 10	18
13	15. 48	16. 45	17. 42	18. 39	19, 36	20. 33	21. 29	17
14	16. 06	17. 03	18. 00	18. 57	19, 54	20, 52	21. 48	16
15	16. 24	17. 21	18, 18	19. 15	20. 12	21, 10	22. 06	15
16	16. 41	17, 38	18. 36	19. 33	20. 30	21. 38	22. 24	14
17	16. 58	17, 55	18. 53	19. 51	20, 48	21. 46	22. 42	13
18	17, 15	18. 12	19. 10	20. 08	21, 05	22, 03	22. 59	12
19	17. 32	18. 29	19, 27	20. 25	21. 22	22, 20	23. 16	11
20	17. 48	18. 46	19, 44	20. 41	21. 39	22. 37	23. 33	10
21	18. 04	19. 02	20. 00	20, 57	21, 55	22. 53	23. 50	9
22	18. 20	19. 18	20. 16	21, 13	22. 11	23. 09	24. 06	8
23	18. 35	19, 34	20, 32	21, 29	22, 27	23. 25	24. 22	7
24	18. 50	19. 49	20. 47	21, 45	22, 43	23, 41	24. 38	6
25	19. 05	20. 03	21. 02	22, 00	22. 58	23, 56	24. 53	5
26	19. 19	20, 17	21. 16	22, 14	23. 12	24, 11	25. 08	4
27	19, 33	20. 31	21. 30	22. 28	23. 26	24. 25	25. 22	3
28	19, 47	20, 45	21. 44	22, 42	23. 40	24, 39	25. 36	2
29	20. 09	20. 59	21, 57	22, 56	23, 54	24, 53	25. 50	1
30	20. 13	21. 12	22. 10	23. 09	24, 07	25. 06	26. 05	0

♌ *North Latitude.*   ♒ *South Latitude.*

♌ South Latitude.			♏ North Latitude.				
	0	1	2	3	4	5	6
0	10. 35	9. 39	8. 43	7. 46	6, 50	5. 53	30
1	10, 56	10. 00	9. 04	8, 07	7. 11	6. 14	29
2	11. 17	10. 20	9. 24	8. 28	7. 31	6. 34	28
3	11. 37	10, 40	9. 44	8. 48	7, 51	6, 54	27
4	11. 58	11, 01	10, 04	9, 08	8, 11	7. 14	26
5	12. 18	11, 21	10, 24	9. 28	8, 31	7. 34	25
6	12. 38	11. 41	10. 44	9. 48	8. 51	7, 53	24
7	12, 58	12, 01	11, 04	10. 07	9. 10	8. 12	23
8	13. 17	12. 20	11. 23	10. 26	9. 29	8. 31	22
9	13, 36	12. 39	11. 42	10. 45	9, 48	8. 50	21
10	13. 55	12. 58	12. 01	11, 04	10. 07	9, 09	20
11	14, 14	13, 17	12, 20	11, 23	10. 29	9, 27	19
12	14. 32	13, 35	12. 38	11, 41	10. 43	9. 45	18
13	14. 50	13. 53	12. 56	11. 59	11, 01	10. 03	17
14	15, 08	14. 11	13, 14	12. 17	11. 19	10. 21	16
15	15, 26	14. 29	13, 31	12. 34	11. 36	10, 38	15
16	15. 43	14. 46	13, 48	12, 51	11. 53	10, 55	14
17	16, 00	15. 03	14. 05	13, 08	12, 10	11. 12	13
18	16. 17	15, 20	14. 22	13, 24	12, 26	11. 28	12
19	16. 34	15, 36	14. 38	13. 40	12. 42	11. 44	11
20	16. 50	15, 52	14. 54	13. 56	12, 58	12, 00	10
21	17. 06	16, 08	15. 10	14. 12	13, 14	12. 15	9
22	17. 22	16, 24	15. 26	14, 28	13, 29	12. 30	8
23	17, 37	16, 39	15. 41	14. 43	13. 44	12, 45	7
24	17. 52	16, 54	15, 56	14, 58	13. 59	13, 00	6
25	18. 07	17, 09	16. 10	15. 12	14. 13	13. 14	5
26	18. 21	17. 23	16, 25	15. 26	14, 27	13. 28	4
27	18. 35	17. 36	16. 38	15, 39	14, 41	13. 41	3
28	18, 48	17. 50	16. 51	15. 52	14. 54	13. 54	2
29	19. 01	18. 03	17. 04	16, 05	15. 07	14. 07	1
30	19. 14	18. 16	17. 17	16. 18	15. 20	14. 21	0

♌ South Latitude.　　　♒ North Latitude.

♊ North Latitude.						♌ South Latitude.	
♊	0	1	2	3	4	5	6	♌
0	20. 13	21. 12	22. 10	23. 9	24. 07	25. 06	26. 03	30
1	20. 26	21. 25	22. 23	23. 22	24. 20	25. 19	26. 16	29
2	20. 38	21. 37	22. 36	23. 35	24. 33	25. 32	26. 29	28
3	20. 50	21. 49	22. 48	23. 47	24. 45	25. 44	26. 42	27
4	21. 01	22. 00	22. 59	23. 58	24. 57	25. 55	26. 54	26
5	21. 13	22. 11	23. 10	24. 09	25. 08	26. 07	27. 05	25
6	21. 23	22. 22	23. 21	24. 21	25. 19	26. 18	27. 21	24
7	21. 33	22. 32	23. 31	24. 31	25. 30	26. 29	27. 27	23
8	21. 43	22. 42	23. 41	24. 41	25. 40	26. 39	27. 37	22
9	21. 53	22. 52	23. 51	24. 51	25. 50	26. 49	27. 47	21
10	22. 02	23. 01	24. 00	25. 00	25. 59	26. 58	27. 56	20
11	22. 10	23. 10	24. 9	25. 09	26. 08	27. 07	28. 05	19
12	22. 19	23. 19	24. 18	25. 18	26. 17	27. 16	28. 14	18
13	22. 27	23. 27	24. 26	25. 26	26. 25	27. 24	28. 22	17
14	22. 34	23. 34	24. 33	25. 33	26. 32	27. 31	28. 30	16
15	22. 41	23. 41	24. 40	25. 39	26. 39	27. 38	28. 37	15
16	22. 47	23. 43	24. 46	25. 45	26. 45	27. 45	28. 43	14
17	22. 53	23. 53	24. 53	25. 52	26. 52	27. 52	28. 49	13
18	22. 59	23. 59	24. 59	25. 58	26. 58	27. 58	28. 55	12
19	23. 4	24. 4	25. 4	26. 03	27. 03	28. 03	29. 2	11
20	23. 9	24. 9	25. 9	26. 08	27. 08	28. 08	29. 7	10
21	23. 13	24. 13	25. 13	26. 13	27. 12	28. 12	29. 12	9
22	23. 17	24. 17	25. 17	26. 17	27. 16	28. 16	29. 15	8
23	23. 20	24. 20	25. 20	26. 20	27. 19	28. 19	29. 18	1
24	23. 23	24. 23	25. 23	26. 23	27. 22	28. 22	29. 22	6
25	23. 26	24. 26	25. 26	26. 26	27. 25	28. 25	29. 25	5
26	23. 28	24. 28	25. 28	26. 28	27. 28	28. 28	29. 28	4
27	23. 30	24. 30	25. 30	26. 30	27. 30	28. 30	29. 30	3
28	23. 30	24. 31	25. 31	26. 31	27. 31	28. 31	29. 31	2
29	23. 31	24. 31	25. 31	26. 31	27. 31	28. 31	29. 31	1
30	23. 31	24. 31	25. 31	26. 31	27. 31	28. 31	29. 31	0

♊ South Latitude.				♐ North Latitude.		
0	1	2	3	4	5	6
19. 14	18. 16	17. 17	16. 18	15. 20	14. 21	30
19, 27	18. 28	17. 29	16. 30	15. 32	14, 33	29
19. 31	18, 40	17. 41	16. 42	15. 44	14. 45	28
19. 51	18. 52	17. 53	16. 54	15. 55	14. 57	27
20. 02	19, 03	18. 08	17. 06	16. 07	15. 08	26
20. 13	19. 15	18. 16	17. 17	16, 18	15. 18	25
20. 24	19. 25	18. 26	17. 27	16. 28	15. 28	24
20. 34	19. 35	18. 36	17. 37	16, 38	15. 38	23
20. 44	19. 45	18. 46	17 47	16 47	15. 48	22
20. 54	19, 55	18, 56	17. 56	16. 56	15. 57	21
21. 03	20. 04	19. 05	18. 05	17. 06	16. 05	20
21. 11	20. 12	19. 13	18. 13	17. 14	16. 13	19
21. 19	20. 20	19. 21	18. 21	17. 22	16, 21	18
21. 27	20. 28	19, 28	18. 29	17. 29	16. 28	17
21. 35	20, 35	19. 35	18. 36	17. 36	16. 35	16
21. 41	20, 41	19. 41	18. 42	17. 42	16. 42	15
21. 47	20. 47	19. 47	18. 48	17. 98	16. 48	14
21, 53	20. 53	19. 53	18. 54	17. 54	16. 54	13
21. 59	20. 59	19, 59	19. 00	18. 00	16. 59	12
22, 04	21, 04	20. 04	19, 05	18. 04	17. 04	11
22. 09	21. 09	20. 09	19. 10	18. 10	17. 09	10
22, 13	21, 13	20. 13	19, 14	18. 14	17. 14	9
22. 17	21. 17	20. 17	19. 17	18. 17	17. 17	8
22, 20	21. 20	20. 20	19, 20	18, 20	17, 20	7
22, 23	21. 23	20. 23	19. 23	18. 23	17. 23	6
22. 26	21. 26	20, 26	19, 26	18, 26	17. 26	5
22. 28	21. 28	20. 28	19. 28	18, 28	17, 28	4
22. 30	21. 30	20. 30	19. 30	18. 30	17, 30	3
22, 31	21, 31	20. 31	19. 31	18. 31	17. 31	2
22. 31	21. 31	20, 31	19. 31	18. 31	17. 31	1
22. 31	21, 31	20. 31	19. 31	18. 31	17, 31	0

♈ *North Latitude.*   ♎ 180 Adde.

	0	1	2	3	4	5	6	
0	0. 00	359.37	359.13	358.49	358.25	358. 1	357.37	30
1	0, 55	00.32	00.08	359.44	359.20	358.56	358.32	29
2	1, 50	01.27	01,03	0. 39	0. 15	359.51	359.27	28
3	2. 45	02.22	01.58	1. 34	1. 10	0.46	0.22	27
4	3, 40	3. 17	2. 53	2. 29	2. 5	1. 41	1. 17	26
5	4. 35	4. 12	3. 48	3. 24	3. 0	2. 36	2. 12	25
6	5, 30	5, 07	4. 43	4. 19	3. 55	3. 31	3. 7	24
7	6. 25	6. 02	5 38	5. 14	4. 50	4. 26	4. 2	23
8	7, 21	6, 57	6. 33	6. 9	5. 45	5. 21	4. 57	22
9	8. 16	7. 52	7. 28	7. 4	6. 40	6. 16	5. 52	21
10	9. 11	8, 47	8. 23	7. 59	7. 35	7. 11	6. 47	20
11	10. 06	09, 42	9. 18	8. 55	8. 31	8. 7	7. 43	19
12	11, 02	10. 38	10. 14	9. 51	9. 27	9. 3	8. 39	18
13	11, 57	11. 33	11. 09	10. 46	10. 22	9. 58	9. 34	17
14	12, 53	12. 29	12. 05	11. 42	11. 18	10. 54	10. 30	16
15	13. 48	13. 25	13. 01	12. 38	12. 14	11. 50	11. 26	15
16	14. 44	14, 20	13, 57	13. 34	13. 10	12. 46	12. 22	14
17	15. 40	15. 16	14, 53	14. 30	14. 6	13. 42	13. 18	13
18	16. 35	16, 12	15. 49	15. 26	15. 2	14. 39	14. 15	12
19	17. 31	17. 08	16, 45	16. 22	15. 58	15. 35	15. 11	11
20	18. 27	18. 04	17. 41	17. 18	16. 54	16. 31	16. 7	10
21	19. 23	19. 00	18, 37	18. 14	17. 51	17. 28	17. 4	9
22	20. 20	19. 56	19. 33	19. 11	18. 48	18. 25	18. 1	8
23	21. 16	20. 53	20, 30	20. 8	19. 45	19. 22	18. 58	7
24	22. 12	21. 50	21. 27	21. 5	20. 42	20. 19	19. 55	6
25	23, 09	22. 47	22. 24	22. 2	21. 39	21. 16	20. 52	5
26	24. 06	23. 44	23. 21	22. 59	22. 36	22. 13	21. 50	4
27	25. 02	24. 41	24. 19	23. 57	23. 34	23. 11	22. 48	3
28	25. 59	25. 38	25. 16	24. 54	24. 31	24. 9	23. 46	2
29	26. 57	26. 35	26. 13	25. 51	25. 29	25. 7	24. 44	1
30	27. 54	27. 33	27. 11	26. 4	26. 27	26. 5	25. 42	0

	0	1	2	3	4	5	6	
	♈	South Latitude			♎		180 Adde.	
0		0. 23	0. 47	1, 11	1. 35	1, 59	2. 23	30
1		1, 18	1. 42	2. 06	2, 30	2. 54	3. 18	29
2		2. 13	2. 37	3. 01	3. 25	3. 49	4. 13	28
3		3. 08	3. 32	3. 56	4. 20	4. 44	5. 08	27
4		4. 03	4. 27	4, 51	5, 15	5, 39	6. 03	26
5		4. 58	5. 22	5. 46	6. 10	6. 34	6, 58	24
6		5, 54	6. 18	6. 42	7. 06	7. 30	7. 53	23
7		6, 49	7. 13	7. 37	8. 01	8. 25	8. 48	22
8		7. 44	8, 08	8, 32	8. 56	9. 20	9, 43	22
9		8. 40	9, 04	9. 28	9, 51	10. 15	10. 36	20
10		9. 35	9. 59	10, 23	10. 46	11. 10	11. 33	19
11		10. 30	10. 54	11. 18	11. 41	12. 05	12. 28	18
12		11. 25	11. 49	12. 13	12. 36	13. 00	13. 23	17
13		12. 20	12. 44	13. 08	13. 31	13. 55	14. 18	16
14		13. 16	13. 39	14, 03	14. 26	14, 50	15. 13	15
15		14. 12	14. 35	14. 58	15, 21	15. 45	16. 08	14
16		15. 07	15. 30	15, 53	16. 16	16. 40	17, 03	13
17		16. 02	16, 25	16, 48	17. 11	17. 35	17. 58	12
18		16, 58	17, 21	17. 44	18, 07	18. 30	18. 53	11
19		17. 54	18. 17	18. 40	19, 02	19. 25	19. 48	10
20		18. 50	19. 13	19. 36	19, 58	20, 21	20. 43	9
21		19. 46	20. 09	20, 32	20. 54	21, 17	21. 39	8
22		20. 42	21. 05	21, 28	21. 50	22, 12	22. 34	7
23		21. 38	22. 01	22, 24	22. 46	23. 08	23. 30	6
24		22. 35	22. 57	23, 20	23, 42	24. 04	24. 26	5
25		23. 31	23. 53	24. 16	24. 38	25, 00	25, 21	4
26		24, 28	24 50	25. 12	25, 34	25. 56	26. 17	3
27		25, 25	2 5 47	26. 09	26. 30	26, 52	27. 13	2
28		26, 22	26. 43	27. 05	27. 26	27, 48	28. 09	2
29		27. 19	27. 40	28. 01	28. 22	28. 44	29, 05	1
30		28. 16	28, 38	28, 58	29. 19	29. 40	30. 01	0

H

♉ *North Latitude.*   ♏ 180 *Adde.*

	0	1	2	3	4	5	6	
0	27. 54	27. 33	27. 11	26. 49	26, 27	26. 05	25, 42	30
1	28. 51	28. 30	28, 08	27. 47	27. 25	27. 03	26. 40	29
2	29. 49	29. 27	29. 06	28. 45	28, 23	28, 01	27, 38	28
3	30, 46	30. 25	30, 04	29, 43	29, 21	28. 59	28, 37	27
4	31. 43	31. 23	31. 02	30, 41	30. 19	29, 58	29. 36	26
5	32. 42	32, 22	32. 00	31. 39	31, 18	30. 57	30. 35	25
6	33. 40	33. 20	32, 58	32. 38	32, 17	31. 56	31. 34	24
7	34. 38	34. 18	33. 58	33. 37	33. 16	32. 55	32. 33	23
8	35. 36	35. 17	34, 57	34. 36	34. 15	33. 54	33. 33	22
9	36, 34	36. 16	35, 56	35, 36	35. 15	34. 54	34, 33	21
10	37, 33	37. 15	36. 55	36. 35	36. 15	35, 54	35, 33	20
11	38. 33	38, 14	37, 54	37. 35	37. 15	36. 54	36. 33	19
12	39. 32	39. 14	38. 54	38. 35	38. 15	37. 55	37, 34	18
13	40, 31	40. 13	39. 54	39. 35	39. 15	38. 56	38. 35	17
14	41. 31	41. 13	40, 54	40, 35	40, 16	39. 57	39, 36	16
15	42. 31	42. 13	41. 54	41. 36	41, 17	40. 58	40. 38	15
16	43. 31	43, 13	42, 54	42. 36	42, 18	41. 59	41. 39	14
17	44, 31	44, 13	43, 55	43. 37	43. 19	43. 00	42. 40	13
18	45. 31	45, 14	44. 56	44. 38	44. 20	44. 01	43, 42	12
19	46. 32	46. 14	45. 57	45. 39	45, 21	45. 03	44. 44	11
20	47. 32	47, 15	46. 58	46, 40	46, 23	46. 05	45. 46	10
21	48. 33	48. 16	47. 59	47, 42	47, 25	47. 07	46. 49	9
22	49, 34	49. 17	49. 00	48, 44	48. 27	48. 09	47. 52	8
23	50. 35	50. 18	50. 02	49, 46	49. 29	49. 12	48. 55	7
24	51, 36	51. 20	51, 04	50, 48	50. 32	50, 15	49. 58	6
25	52. 38	52. 22	52. 06	51. 51	51. 35	51. 18	51, 02	5
26	53. 40	53. 24	53. 09	52. 54	52. 38	52. 22	52. 06	4
27	54, 42	54, 27	54. 12	53. 57	53. 42	53, 26	53, 10	3
28	55. 44	55. 29	55, 15	55, 00	54. 45	54, 30	54. 14	2
29	56. 46	56. 32	56. 18	56. 03	55, 49	55, 34	55, 18	1
30	57, 48	57. 35	57, 21	57. 07	56. 53	56. 38	56. 23	0

♉ South Latitude					♏ 180 *Adde.*		
	0	1	2	3	4	5	6
0		28. 16	28. 37	28, 58	29, 19	29, 40	30. 01	30
1		29, 13	29. 34	29. 55	30. 16	30. 37	30. 57	29
2		30. 10	30, 31	30. 52	31. 13	31. 34	31. 54	28
3		31. 07	31, 28	31. 49	32. 10	32. 31	32. 51	27
4		32. 05	32. 25	32ᶜ 46	33. 07	33, 27	33. 47	26
5		33. 03	33. 23	33. 43	34, 04	34. 24	34, 44	25
6		34, 01	34. 21	34. 41	35. 01	35. 21	35. 41	24
7		34, 59	35. 19	35. 39	35. 58	36. 18	36. 38	23
8		35. 57	36, 17	36, 37	36. 56	37. 15	37, 35	22
9		36. 56	37, 15	37. 35	37. 54	38. 13	38. 32	21
10		37. 54	38. 13	38, 33	38, 52	39. 11	39. 29	20
11		38. 53	39. 12	39. 31	39, 50	40. 09	40. 27	19
12		39. 52	40. 11	40. 30	40. 48	41. 07	41, 25	18
13		40. 51	41. 10	41. 28	41, 46	42. 05	42. 23	17
14		41. 50	42. 09	42, 27	42, 45	43, 03	43. 21	16
15		42. 49	43. 08	43. 26	43, 44	44, 02	44. 19	15
16		43. 49	44. 07	44, 25	44, 43	45. 00	45, 17	14
17		44. 49	45, 06	45, 24	45. 42	45. 59	46. 15	13
18		45. 49	46, 06	46. 23	46. 41	46. 58	47. 14	12
19		46. 49	47. 06	47, 23	47. 40	47. 57	48. 13	11
20		47. 49	48. 06	48. 23	48, 39	48, 56	49. 12	10
21		48. 50	49. 06	49. 23	49. 39	49. 55	50. 11	9
22		49, 50	50. 06	50, 23	50, 38	50, 54	51. 10	8
23		50. 51	51. 06	51. 23	51, 38	51. 53	52. 09	7
24		51. 52	52. 07	52, 23	52. 38	52. 53	53. 08	6
25		52. 53	53. 08	53. 23	53. 38	53. 53	54, 08	5
26		53. 55	54. 09	54. 24	54, 38	54. 53	55. 07	4
27		54. 56	55, 11	55. 25	55. 39	55, 53	56. 07	3
28		55, 58	56. 12	56. 26	56. 40	56, 54	57. 07	2
29		57. 00	57, 13	57. 27	57. 41	57. 54	58, 07	1
30		58. 03	58, 15	58, 29	58. 42	58. 55	59. 07	0

♊ North Latitude.   ♐ 180 Adde.

	0	1	2	3	4	5	6	
0	57. 48	57. 35	57. 21	57. 07	56, 53	56. 38	56, 23	30
1	58. 51	58. 38	58. 24	58, 10	57. 57	57. 42	57. 28	29
2	59. 53	59, 41	59, 27	59. 14	59. 01	58, 47	58, 33	28
3	60. 56	60. 44	60. 31	60, 18	60. 05	59. 52	59, 38	27
4	61. 59	61. 47	61, 35	61. 22	61, 10	60, 57	60. 44	26
5	63. 03	62. 51	62. 39	62. 27	62, 15	62. 02	61. 50	25
6	64. 06	63. 55	63, 43	63. 32	63, 20	63. 08	62. 56	24
7	65, 09	64. 59	64, 47	64. 37	64, 25	64. 13	64. 02	23
8	66. 13	66 03	65, 52	65. 42	65. 30	65. 19	65. 08	22
9	67, 17	67. 07	66. 57	66. 47	66. 36	66. 25	66, 14	21
10	68. 21	68. 11	68. 02	67. 52	67. 42	67, 31	67. 21	20
11	69, 25	69. 16	69. 07	68. 57	68. 48	68. 38	68. 28	19
12	70. 29	70. 21	70, 12	70. 03	69. 54	69. 45	69, 35	18
13	71. 34	71, 26	71, 17	71. 09	71. 00	70. 51	70. 42	17
14	72. 38	72. 31	72. 22	72, 15	72, 06	71. 58	71, 49	16
15	73, 42	73. 36	73. 28	73, 21	73. 13	73. 05	72. 57	15
16	74. 47	74, 41	74. 33	74, 27	74. 19	74. 12	74. 04	14
17	75, 52	75. 46	75. 39	75. 33	75, 26	75. 19	75. 12	13
18	76. 57	76. 51	76. 45	76. 39	76. 33	76. 27	76, 20	12
19	78. 02	77. 56	77, 51	77. 45	77. 40	77. 34	77. 28	11
20	79. 07	79. 02	78, 57	78. 52	78, 47	78. 41	78. 36	10
21	80. 12	80, 08	80, 03	79, 59	79. 54	79. 49	79. 44	9
22	81, 17	81. 13	81. 09	81. 05	81. 01	80. 56	80. 52	8
23	82. 22	82, 18	82. 15	82. 11	82. 08	82. 04	82. 00	7
24	83. 18	83. 24	83. 21	83. 18	83. 15	83, 12	83. 09	6
25	84, 33	84, 30	84. 27	84. 25	84. 22	84. 20	84. 17	5
26	85. 38	85. 36	85. 33	85. 32	85. 29	85, 28	85. 23	4
27	86. 44	86, 42	86. 40	86. 39	86, 37	86, 36	86, 34	3
28	87. 49	87. 48	87, 46	87, 46	87, 44	87. 44	87. 42	2
29	88. 55	88, 54	88. 53	88. 53	88. 52	88. 52	88, 51	1
30	90. 00	90. 00	90, 00	90. 00	90. 00	90. 00	90. 00	0

II	South Latitude.				♐	180 *Adde*	
	0	1	2	3	4	5	6
0	58. 02	58. 15	58. 29	58. 42	58. 55	59. 07	30
1	59. 04	59. 17	59, 30	59. 43	59. 55	60. 07	29
2	60. 06	60. 19	60. 31	60, 44	60. 56	61. 08	28
3	61, 09	61. 21	61, 33	61. 46	61. 57	62. 09	27
4	62. 11	62. 23	62. 35	62. 48	62. 58	63. 09	26
5	63. 14	63, 25	63. 37	63. 50	63. 59	64, 10	25
6	64. 17	64, 28	64. 39	64. 52	65. 01	65. 11	24
7	65. 20	65. 31	65, 41	65. 54	66. 02	66. 12	23
8	66, 23	66. 34	66. 44	66. 56	67. 04	67. 13	22
9	67. 27	67. 37	67. 46	67, 58	68, 06	68, 15	21
10	68. 30	68. 40	68. 49	68. 59	69. 07	69. 16	20
11	69. 34	69, 43	69. 52	70, 01	70. 09	70, 17	19
12	70. 38	70. 46	70, 55	71. 03	71. 11	71. 19	18
13	71. 42	71. 49	71. 58	72. 05	72, 13	72. 21	17
14	72. 46	72. 53	73. 01	73. 08	73, 15	73. 23	16
15	73, 50	73, 57	74. 04	74. 11	74. 18	74, 25	15
16	74. 54	75. 01	75. 07	75. 14	75, 20	75. 27	14
17	75. 58	76, 05	76. 11	76, 17	76. 23	76. 29	13
18	77, 03	77. 09	77. 15	77. 20	77. 26	77. 31	12
19	78. 07	78. 13	78. 18	78. 23	78, 28	78. 33	11
20	79. 12	79. 17	79, 21	79. 26	79. 31	79. 35	10
21	80. 17	80, 21	80, 25	80. 29	80. 34	80. 38	9
22	81. 21	81. 25	81. 28	81. 32	81. 36	81. 40	8
23	82. 25	82, 29	82, 32	82. 35	82. 39	82. 42	7
24	83. 30	83. 33	83. 36	83. 39	83. 42	83, 45	6
25	84. 35	84. 37	84. 40	84. 42	84. 45	84. 47	5
26	85. 40	85. 41	85. 44	85. 45	85. 48	85, 49	4
27	86. 45	86, 46	86. 48	86, 49	86. 51	86. 52	3
28	87. 50	87. 50	87. 52	87. 52	87. 54	87. 54	2
29	88. 55	88. 55	88. 56	88. 56	88. 57	88. 57	1
30	90, 00	90, 00	90, 00	90. 00	90. 00	90. 00	0

♋ *North Latitude.*   ♑ 180 *Adds*

	0	1	2	3	4	5	6	
0	90.00	90.00	90.00	90.00	90.00	90.00	90.00	
1	91.05	91.06	91.07	91.07	91.07	91.08	91,09	30
2	92.11	92.12	92.14	92.14	92.15	92.16	92,18	29
3	93.16	93.18	93.20	93.21	93.23	93.24	93,26	28
								27
4	94.22	94.24	94.27	94.28	94.30	94.32	94.37	26
5	95.27	95.30	95.33	95.35	95.38	95.40	95.43	25
6	96.32	96.36	96.39	96.42	96.45	96.48	96,51	24
7	97.38	97.42	97.45	97.49	97.52	97.56	98,00	23
8	98.43	98.47	98.51	98.55	99.00	99.04	99.08	22
9	99.48	99.52	99.57	100.01	100.07	100.12	100.16	21
10	100.53	100.58	101.03	101.08	101.14	101.19	101.24	20
11	101.58	102.04	102.09	102.15	102.21	102.26	102.32	19
12	103.03	103.09	103.15	103.21	103.27	103.33	103.40	18
13	104.08	104.14	104.21	104.27	104.34	104.41	104.48	17
14	105.13	105.19	105.27	105.33	105.40	105.48	105.56	16
15	106.17	106.24	106.33	106.39	106.47	106.55	107.03	15
16	107.22	107.29	107.38	107.45	107.53	108.02	108.11	14
17	108.26	108.34	108.42	108.51	108.59	109.09	109.18	13
18	109.31	109.39	109.48	109.57	110.05	110.15	110.25	12
19	110.35	110.44	110.53	111.03	111.12	111,22	111.32	11
20	111.39	111.49	111.58	112.08	112.18	112.29	112.39	10
21	112,43	112.53	113.03	113.13	113.24	113.35	113.46	9
22	113.47	113.57	114.08	114.18	114.30	114.41	114.53	8
23	114.51	115.01	115.13	115.23	115.35	115.47	115.58	7
24	115.54	116.05	116.17	116 28	116.41	116.52	117.04	6
25	116.57	117.09	117.21	117.33	117.46	117.58	118.10	5
26	118.01	118.13	118.25	118.38	118.51	119.03	119.16	4
27	119.04	119.16	119.29	119.42	119.55	120.08	120.22	3
28	120.07	120.19	120.33	120.46	120.59	121.13	121.27	2
29	121.09	121.22	121.36	121.50	122.03	122.18	122.32	1
30	122.12	122.25	122.39	122.53	123.07	123.22	123.37	0

♋ South Latitude.					♑ 180 *Adde.*		
	0	1	2	3	4	5	6
0		90.00	90.00	90.00	90.00	90.00	90.00	30
1		91.05	91.05	91.04	91.04	91.04	91.04	29
2		92.10	92.10	92.08	92.07	92.07	92.07	28
3		93.15	93.14	93.12	93.11	93.11	93.08	27
4		94.20	94.19	94.16	94.15	94.15	94.11	26
5		95.25	95.23	95.20	95.18	95.18	95.13	25
6		96.30	96.27	96.24	96.21	96.21	96.15	24
7		97.35	97.31	97.28	97.25	97.25	97.18	23
8		98.39	98.35	98.32	98.28	98.28	98.20	22
9		99.44	99.39	99.36	99.31	99.31	99.22	21
10		100.48	100.43	100.39	100.34	100.34	100.25	20
11		101.53	101.47	101.42	101.37	101.37	101.27	19
12		102.57	102.51	102.45	102.40	102.40	102.29	18
13		104.02	103.55	103.49	103.43	103.43	103.31	17
14		105.06	104.59	104.52	104.46	104.46	104.33	16
15		106.10	106.03	105.56	105.49	105.49	105.35	15
16		107.14	107.07	106.59	106.52	106.52	106.37	14
17		108.17	108.11	108.02	107.55	107.55	107.39	13
18		109.22	109.14	109.05	108.57	108.57	108.41	12
19		110.26	110.17	110.08	110.00	110.00	109.43	11
20		111.30	111.20	111.11	111.02	111.02	110.44	10
21		112.33	112.23	112.14	112.04	112.04	111.45	9
22		113.37	113.26	113.16	113.06	113.06	112.47	8
23		114.40	114.29	114.19	114.08	114.08	113.48	7
24		115.43	115.32	115.21	115.10	115.10	114.49	6
25		116.46	116.35	116.23	116.12	116.12	115.50	5
26		117.49	117.37	117.25	117.14	117.14	116.51	4
27		118.51	118.39	118.27	118.15	118.15	117.51	3
28		119.54	119.41	119.29	119.16	119.16	118.52	2
29		120.56	120.43	120.30	120.17	120.17	119.53	1
30		121.58	121.45	121.31	121.18	121.18	120.53	0

♌ *North Latitude.* ♒ 180 *Adde*

	0	1	2	3	4	5	6	
0	122.12	122.25	122.39	122.53	123.07	123.22	123.37	30
1	123.14	123.28	123.42	123.57	124.11	124.26	124.42	29
2	124.16	124.31	124.45	125.00	125.15	125.30	124.46	28
3	125.18	125.33	125.48	126.03	126.18	126.34	126.50	27
4	126.20	126.36	126.51	127.06	127.22	127.38	127.54	26
5	127.22	127.38	127.54	128.09	128.25	128.42	128.58	25
6	128.24	128.40	128.56	129.12	129.28	129.45	130.02	24
7	129.25	129.42	129.58	130.14	130.31	130.48	131.05	23
8	130.26	130.43	131.00	131.16	131.33	131.51	132.08	22
9	131.27	131.44	132.01	132.18	132.35	132.53	133.11	21
10	132.28	132.45	133.02	133.20	133.37	133.55	134.14	20
11	133.28	133.46	134.03	134.21	234.39	134.57	135.16	19
12	134.29	134.47	135.04	135.22	135.40	135.59	136.18	18
13	135.29	135.47	136.05	136.23	136.41	137.00	137.20	17
14	136.29	136.47	137.06	137.24	137.42	138.01	138.21	16
15	137.29	137.47	138.06	138.24	138.43	139.02	139.22	15
16	138.29	138.47	139.06	139.25	139.44	140.03	140.24	14
17	139.28	139.47	140.06	140.25	140.45	141.04	141.25	13
18	140.28	140.46	141.06	141.25	141.45	142.05	142.26	12
19	141.27	141.46	142.06	142.25	142.45	143.06	143.27	11
20	142.26	142.45	143.05	143.25	143.45	144.06	144.27	10
21	143.25	143.44	144.04	144.24	144.45	145.06	145.27	9
22	144.23	144.43	145.03	145.24	145.45	146.06	146.27	8
23	145.22	145.42	146.02	146.23	146.44	147.05	147.27	1
24	146.20	146.40	147.01	147.22	147.43	148.04	148.26	6
25	147.18	147.39	148.00	148.21	148.42	149.03	149.25	5
26	148.16	148.37	148.58	149.19	149.41	150.02	150.24	4
27	149.14	149.35	149.56	150.17	150.39	151.01	151.23	3
28	150.11	150.33	150.54	151.15	151.37	151.59	152.22	2
29	151.09	151.30	151.52	152.13	152.35	152.57	153.20	1
30	152.06	152.27	152.49	153.11	153.33	153.55	154.18	0

♌ South Latitude				≈ 180 Adde.				
	0	1	2	3	4	5	6	
0		121.58	121.45	121.31	121.18	121.05	120 53	30
1		123.00	122.47	122.33	122.19	122.06	121.53	29
2		124.02	123.48	123 34	123.20	123.06	122.53	28
3		125.03	124.49	124.35	124.21	124.07	123.53	27
4		126.05	125.51	125.36	125.22	125.07	124 53	26
5		127.07	126.52	126.37	126.22	126.07	125.52	25
6		128.08	127.53	127.37	127.22	127.07	126.52	24
7		129.09	128.54	128.37	128.22	128.07	127.51	23
8		130.10	129.54	129.37	129.22	129.06	128.50	22
9		131.10	130.54	130.37	130.21	130.05	129.49	21
10		132.11	131.54	131 37	131.22	131.04	130.48	20
11		133.11	132.54	132.37	132.20	132.03	131.47	19
12		134.11	133.54	133.37	133.19	133.02	132.46	18
13		135.11	134.54	134 36	134.18	134.01	133.45	17
14		136.11	135.53	135.35	135.17	135 00	134 43	16
15		137.10	136.52	136.34	136 16	135.58	135.41	15
16		138.10	137.51	137 33	137.15	136.57	136.39	14
17		139.09	138.50	138 32	138.14	137 55	137.37	13
18		140.08	139.49	139.30	139.13	138.53	138 35	12
19		141.07	140.48	140.29	140.10	139.51	139.33	11
20		142.06	141.47	141.27	141 08	140.49	140.31	10
21		143.04	142.45	142.25	142.06	141.47	141.28	9
22		144.03	143.43	143 23	143.04	142.45	142.25	8
23		145.01	144.41	144.21	144.02	143.42	143.22	7
24		145.59	145.39	145.19	144.59	144.39	144 19	6
25		146.57	146.37	146.17	145 56	145.36	145.16	5
26		147.55	147.35	147.14	146.53	146.33	146.13	4
27		148.53	148.32	148.11	147.50	147.29	147.09	3
28		149.50	149.29	149 08	148.47	148.26	148.06	2
29		150.47	150.26	150.05	149.44	149.23	149 03	1
30		151.44	151.23	151 02	150 41	150.20	149.59	0

I

♍ North Latitude.   ♓ 180 Adde

	0	1	2	3	4	5	6	
0	152.06	152.27	152.49	153.11	153.33	153.55	154.18	30
1	153.04	153.25	153.47	154.09	154.31	154.53	155.16	29
2	154.01	154.22	154.44	155.06	155.29	155.51	156.14	28
3	154.58	155.19	155.41	156.03	156.26	156.49	157.12	27
4	155.54	156.16	156.39	157.01	157.24	157.47	158,10	26
5	156.51	157.13	157.36	157.58	158.21	158.44	159.08	25
6	157.47	158.10	158.33	158.55	159.18	159.41	160.05	24
7	158.44	159.07	159.30	159.52	160.15	160.38	161.02	23
8	159.40	160.04	160.27	160.49	161.12	161.35	161.59	22
9	160.37	161.00	161.23	161.46	162.09	162,32	162.56	21
10	161.33	161.56	162.19	162.42	163.06	163.29	163.53	20
11	162.29	162.52	163.15	163.38	164,02	164.25	164.49	19
12	163.25	163.48	164.11	164.34	164.58	165.21	165.45	18
13	164.20	164.44	165.07	165.30	165.54	166.18	166.42	17
14	165.16	165.40	166.06	166.26	166.50	167.14	167.38	16
15	166.12	166,35	166.59	167.20	167.46	168.10	168.34	15
16	167.07	167.31	167.55	168.18	168.42	169.06	169.30	14
17	168.03	168.27	168 51	169.14	169.38	170.02	170.26	13
18	168.58	169,23	169.46	170.09	170,33	170.57	171.21	12
19	169.54	170,18	170.42	171.05	171.29	171.53	172.17	11
20	170.49	171,13	171.37	172.01	172.25	172.39	173.13	10
21	171.44	172.08	172.32	172.56	173.20	173.44	174.08	9
22	172.39	173.03	173.27	173.51	174.15	174.39	175.03	8
23	173.35	173.58	174.22	174.46	175.10	175.34	175.58	7
24	174.30	173.53	175.17	175.41	176.05	176.29	176.54	6
25	175.25	175.48	176.12	176.36	177.00	177.24	177.48	5
26	176.20	176.43	177.07	177.31	177.55	178.19	178,43	4
27	177.15	177.38	178.02	178.26	178.50	179.14	179.38	3
28	178.10	178.33	178.57	179.21	179.45	180.09	180.33	2
29	179.05	179.28	179.52	180.16	180.40	181,04	181.28	1
30	180.00	180.23	180.47	181.11	181.35	181.59	182.23	0

♍ South Latitude					♓ 180 *Adde.*		
0	1	2	3	4	5	6	
0		151.44	151.23	151.02	150.41	150.20	149.59	30
1		152.41	152.20	151.59	151.38	151.16	150.55	29
2		153.38	153.17	152.55	152.34	152.12	151.50	28
3		154.35	154.13	153.51	153.30	153.08	152.47	27
4		155.32	155.10	154.48	154.26	154.04	153.43	26
5		156.29	156.07	155.44	155.22	155.00	154.39	25
6		157.25	157.03	156.40	156.18	155.56	155.34	24
7		158.22	157.59	157.36	157.14	156.52	156.30	23
8		159.18	158.55	158.32	158.10	157.48	157.26	22
9		160.14	159.51	159.28	159.06	158.43	158.21	21
10		161.10	160.47	160.24	160.02	159.39	159.17	20
11		162.06	161.43	161.20	160.58	160.35	160.12	19
12		163.02	162.39	162.16	161.53	161.30	161.07	18
13		163.58	163.35	163.12	162.49	162.25	162.02	17
14		164.53	164.30	164.07	163.44	163.20	162.57	16
15		165.48	165.25	165.02	164.39	164.15	163.52	15
16		166.44	166.21	165.57	165.34	165.10	164.47	14
17		167.40	167.17	166.52	166.29	166.05	165.42	13
18		168.35	168.12	167.47	167.24	167.00	166.37	12
19		169.31	169.07	168.43	168.19	167.55	167.32	11
20		170.26	170.02	169.38	169.14	168.50	168.27	10
21		171.21	170.57	170.33	170.09	169.45	169.22	9
22		172.16	171.52	171.28	171.04	170.40	170.17	8
23		173.11	172.47	172.23	171.59	171.35	171.12	7
24		174.06	173.42	173.18	172.54	172.30	172.07	6
25		175.02	174.38	174.14	173.50	173.26	173.02	5
26		175.57	175.33	175.09	174.45	174.21	173.57	4
27		176.52	176.28	176.04	175.40	175.16	174.52	3
28		177.47	177.23	176.59	176.35	176.11	175.47	2
29		178.42	178.18	177.54	177.30	177.06	176.42	1
30		179.27	179.13	178.49	178.25	178.01	177.37	0

Poles	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	13	14
3	3	6	9	13	16	19	22
4	4	8	13	17	21	25	30
5	5	10	16	21	26	32	37
6	6	13	19	25	32	38	44
7	7	15	22	30	37	44	52
8	8	17	25	34	42	51	59
9	9	19	29	38	48	57	1. 07
10	11	21	32	42	53	1. 04	1. 14
11	12	23	35	47	58	1. 10	1 22
12	13	25	38	51	1. 04	1. 17	1. 30
13	14	28	42	56	1, 09	1. 23	1. 37
14	15	30	45	1, 00	1. 15	1. 30	1. 45
15	16	32	48	1. 04	1. 21	1. 37	1. 53
16	17	34	52	1. 09	1. 26	1. 44	2. 01
17	18	37	55	1. 14	1. 32	1. 50	2. 09
18	19	39	59	1, 18	1, 38	1, 57	2. 17
19	21	41	1. 02	1, 23	1. 44	2, 04	2. 25
20	22	44	1. 06	1. 27	1, 49	2. 12	2. 34
21	23	46	1. 09	1, 32	1. 55	2. 19	2. 42
22	24	49	1, 13	1. 37	2. 02	2, 26	2. 51
23	25	51	1. 17	1, 42	2. 08	2. 33	2. 59
24	27	53	1, 20	1. 47	2. 14	2. 41	3. 01
25	28	56	1. 24	1. 52	2, 20	2 49	3. 17
26	29	59	1. 28	1. 57	2. 27	2. 56	3. 26
27	31	1, 01	13 32	2. 03	2. 33	3. 04	3. 35
28	32	1. 04	1. 36	2. 08	2, 40	3. 12	3. 45
29	33	1. 07	1. 40	2. 13	2. 47	3. 20	3. 54
30	35	1, 09	1. 44	2, 19	2. 54	3. 29	4. 04
31	36	1. 12	1. 48	2. 24	3. 01	3. 37	4. 14
32	37	1, 15	1, 53	2. 30	3. 08	3. 46	4. 24

Degrees of Declination.

Elevation	8	9	10	11	12	13	14
1	0. 08	0. 09	0, 11	0. 12	0. 13	0. 14	0. 15
2	0. 17	0. 19	0. 21	0. 23	0. 25	0. 28	0. 30
3	0. 25	0. 29	0. 32	0. 35	0. 38	0. 42	0. 45
4	0, 34	0. 38	0. 42	0. 47	0. 51	0. 56	1. 00
5	0. 42	0. 48	0. 53	0, 58	1, 04	1. 09	1. 15
6	0, 51	0. 57	1. 04	1. 10	1. 17	1. 23	1. 30
7	0. 59	1. 07	1, 14	1, 22	1. 30	1. 37	1. 45
8	1. 08	1. 16	1. 25	1. 34	1, 43	1. 52	2. 00
9	1. 16	1, 26	1. 36	1. 46	1. 56	2. 06	2. 16
10	1. 25	1. 36	1. 47	1, 58	2. 09	2. 20	2. 31
11	1. 34	1, 46	1. 58	2, 10	2. 22	2. 34	2. 47
12	1. 43	1. 56	2. 09	2, 22	2. 35	2. 49	3. 02
13	1. 52	2. 06	2, 20	2. 34	2. 49	3. 03	3, 18
14	2. 00	2. 16	2. 31	2. 47	3. 02	3. 18	3. 34
15	2, 10	2. 26	2. 42	2. 59	3. 16	3. 33	3, 50
16	2. 19	2. 36	2. 54	3. 12	3. 30	3. 48	4. 06
17	2. 28	2. 47	2. 05	3. 24	3. 44	4. 03	4. 22
18	2. 37	2. 57	2. 17	3. 37	3. 58	4. 18	4. 39
19	2. 46	3, 08	3. 29	3. 50	4. 17	4. 34	4. 55
20	2. 56	3, 18	3. 41	4. 03	4, 26	4. 49	5. 12
21	3. 06	3. 29	3. 53	4. 17	4. 41	5. 05	5. 30
22	3, 15	3. 40	4. 05	4, 30	4. 56	5. 21	5, 47
23	3, 25	3, 51	4, 18	4. 44	5. 11	5. 37	6. 07
24	3. 35	4. 03	4. 30	4. 58	5. 26	5. 54	6. 22
25	3. 45	4. 14	4, 43	5. 12	5. 41	6. 11	6. 41
26	3. 56	4, 26	4. 56	5. 26	5. 57	6. 28	6. 59
27	4. 06	4. 38	5. 09	5. 41	6. 13	6. 45	7. 18
28	4. 17	4, 50	5. 23	5. 56	6, 29	7. 03	7. 37
29	4. 28	5. 02	5. 37	6, 11	6. 46	7. 21	7. 57
30	4. 39	5. 15	5. 51	6. 27	7. 03	7. 40	8. 17
31	4. 51	5, 28	6. 05	6. 42	7. 20	7. 58	8. 37
32	5. 02	5. 41	6, 20	6. 59	7. 38	8. 18	8. 58

Degrees of Declination.

Degrees of Declination.

Poles	15	16	17	18	19	20	21
1	00. 16	00. 17	00. 18	00. 19	00. 21	00. 22	00. 23
2	00. 32	00. 34	00. 37	00. 39	00. 41	00. 44	00. 46
3	00. 48	00. 52	00. 55	00. 59	01. 02	01. 06	01. 09
4	01. 04	01. 09	01. 14	01. 18	01. 23	01. 27	01. 32
5	01. 21	01. 16	01. 32	01. 38	01. 44	01. 49	01. 55
6	01. 37	01. 44	01. 50	01. 57	02. 04	02. 12	02. 19
7	01. 57	02. 01	02. 09	02. 17	02. 25	02. 34	02. 42
8	02. 09	02. 19	02. 28	02. 37	02. 46	02. 56	03. 06
9	02. 26	02. 36	02. 47	02. 57	03. 08	03. 18	03. 29
10	02. 42	02. 54	03. 05	03. 17	03. 29	03. 41	03. 53
11	02. 59	03. 12	03. 24	03. 37	03. 50	04. 03	04. 17
12	03. 16	03. 30	03. 44	03. 58	04. 12	04. 26	04. 41
13	03. 33	03. 48	04. 03	04. 18	04. 34	04. 49	05. 05
14	03. 50	04. 06	04. 22	04. 39	04. 55	05. 12	05. 30
15	04. 07	04. 24	04. 42	05. 00	05. 18	05. 36	05. 54
16	04. 24	04. 43	05. 02	05. 21	05. 40	05. 59	06. 19
17	04. 42	05. 02	05. 22	05. 42	06. 02	06. 23	06. 44
18	05. 00	05. 21	05. 42	06. 04	06. 25	06. 47	07. 10
19	05. 18	05. 40	06. 03	06. 25	06. 49	07. 12	07. 36
20	05. 36	05. 59	06. 23	06. 47	07. 12	07. 37	08. 02
21	05. 54	06. 19	06. 44	07. 10	07. 36	08. 02	08. 28
22	06. 13	06. 39	07. 06	07. 33	08. 00	08. 27	08. 55
23	06. 32	06. 59	07. 27	07. 56	08. 24	08. 53	09. 22
24	06. 51	07. 20	07. 49	08. 19	08. 49	09. 19	09. 50
25	07. 11	07. 41	08. 12	08. 43	09. 14	09. 46	10. 19
26	07. 31	08. 02	08. 35	09. 07	09. 40	10. 14	10. 47
27	07. 51	08. 24	08. 58	09. 32	10. 06	10. 41	11. 17
28	08. 11	08. 46	09. 21	09. 57	10. 33	11. 09	11. 47
29	08. 32	09. 09	09. 45	10. 23	11. 10	11. 38	12. 17
30	08. 54	09. 32	10. 10	10. 49	11. 28	12. 08	12. 48
31	09. 16	09. 55	10. 35	11. 16	11. 56	12. 38	13. 20
32	09. 38	10. 19	11. 01	11. 43	12. 25	13. 09	13. 53

Elevation	22	23	24	25	26	27	28
1	00.24	00,25	00,27	00.28	00.29	00,31	00.32
2	00,49	00,51	00.53	00,56	00.59	01.01	01.04
3	01.13	01.17	01,20	01,24	01.28	01,32	01.36
4	01.37	01.42	01,47	01.52	01.57	02.03	02,08
5	02,02	02,08	02.14	02,20	02.27	02.33	02,40
6	02.26	02.33	02,41	02,49	02.56	03.04	03,12
7	02,51	02.59	03.08	03.17	03.26	03,35	03.45
8	03.15	03.25	03.35	03,45	03,56	04,06	04,17
9	03.40	03.51	04.03	04.14	04.26	04,38	04.50
10	04.05	04.18	04.30	04,43	04.56	05.09	05.23
11	04.30	04.44	04,58	05.12	05,27	05.41	05,56
12	04,56	05.11	05.26	05,41	05.57	06.13	06.29
13	05.21	05.38	05.54	06.11	06.28	06.45	07,03
14	05.47	06.05	06,22	06.41	06.59	07.18	07.33
15	06.13	06.32	06,51	07.11	07.31	07,51	08,11
16	06.39	06.59	07.20	07.41	08.03	08.24	08,46
17	07.06	07.27	07.49	08.12	08,35	08.58	09,21
18	07.33	07.56	08.19	08,43	09.07	09.32	09.57
19	08.00	08.24	08.49	09.14	09.40	10.06	10,33
20	08,27	08.53	09.19	09,46	10.14	10,41	11.09
21	08,55	09.23	09,50	10,19	10,47	11,17	11.46
22	09,24	09.53	10.22	10.52	11.22	21,53	12.24
23	09.53	10.23	10.54	11.25	11.57	12,29	13.03
24	10.22	10.54	11,26	11.29	12.33	13.07	13.42
25	10,52	11,25	11.59	12,34	13.09	13.48	14.21
26	11,22	11,57	12.33	13.09	13.46	14.23	15.02
27	11.53	12,29	13.07	13,45	14,23	15.03	15.44
28	12.24	13.03	13.42	14.21	15.02	15.43	16.25
29	12.56	13,37	14.17	14.59	15.41	16.24	17.08
30	13.29	14.11	14.54	15.37	16.21	17,07	17.53
31	14.03	14.47	15,31	16.16	17.02	17,50	18,38
32	14.37	15.23	16.00	16.56	17.45	18.34	19.24

Degrees of Declination.

Poles	29	30	31	32	33	34	35
1	00. 33	00, 35	00. 36	00. 37	00, 39	00, 40	00, 42
2	01. 07	01. 09	01. 12	01, 15	01. 18	01, 21	01. 24
3	01. 40	01, 44	01. 48	01, 53	01, 57	02. 02	02, 06
4	02, 13	02. 19	02. 24	02. 30	02, 36	02. 42	02. 48
5	02, 47	02. 54	03. 01	03, 08	03. 15	03, 23	03. 31
6	03. 20	03. 29	03. 37	03. 46	03, 55	04. 04	04. 13
7	03. 54	04, 04	04. 14	04. 24	04. 34	04. 45	04. 56
8	04, 28	04, 39	04, 51	05, 02	05. 14	05. 26	05. 39
9	05. 02	05. 15	05. 28	05. 41	05. 54	06. 08	06. 22
10	05, 37	05. 51	06. 05	06, 20	06. 35	06. 50	07, 06
11	06. 11	06. 27	06, 42	06. 59	07, 15	07. 32	07. 49
12	06. 46	07, 03	07. 20	07. 38	07. 56	08. 15	08, 34
13	07, 21	07, 40	07. 58	08. 18	08. 37	08. 58	09. 18
14	07. 56	08. 17	08. 37	08. 58	09, 19	09. 41	10, 03
15	08, 32	08. 54	09. 16	09. 38	10, 01	10. 25	10, 49
16	08, 08	09. 32	09. 55	10. 19	10. 44	11. 09	11. 35
17	09, 45	10. 10	10, 35	11. 01	11. 27	11. 54	12. 22
18	10. 23	10. 49	11. 16	11, 43	12. 11	12. 40	13. 09
19	11, 00	11, 28	11. 56	12. 25	12. 55	13. 26	13. 57
20	11. 38	12, 08	12. 38	13, 09	03. 40	14. 13	14. 46
21	12. 17	12, 48	13, 20	13, 53	14, 26	15. 00	15. 39
22	12. 56	13. 29	14. 03	14. 37	15. 13	15. 49	16. 27
23	13. 37	14. 11	14. 47	15. 23	16. 00	16. 38	17. 17
24	14. 17	14, 54	15. 31	16. 09	16, 48	17. 29	18. 10
25	14. 59	15. 37	16. 16	16, 56	17. 38	18, 20	19. 03
26	15. 41	16. 21	17. 02	17. 45	18. 28	19, 12	19, 58
27	16. 24	17. 06	17, 50	18, 34	19. 19	20, 06	20, 54
28	17. 08	17. 53	18. 38	19. 24	20. 12	21. 01	21, 51
29	17. 54	18. 40	19. 27	20. 16	21. 06	21, 57	22. 50
30	18, 40	19, 28	20, 18	21. 09	22. 01	22. 55	23. 51
31	19. 27	20, 18	21. 10	22. 03	22, 58	23. 55	24. 53
32	20. 16	21. 09	22. 03	22. 59	23. 56	24. 46	25. 57

Degrees of Declination.

Elevation	36		37		38		39		40		41		42	
1	00,	44	00.	45	00,	47	00.	49	00.	50	00.	52	00,	54
2	01,	27	01.	31	01.	34	01,	37	01.	41	01.	44	01,	48
3	02,	11	02.	16	02,	21	02.	26	02,	31	02.	37	02.	42
4	02,	55	03.	01	03,	08	03.	15	03,	22	03.	29	03.	37
5	03.	39	03.	47	03,	55	04,	04	04.	13	04.	22	04.	31
6	04.	23	04.	33	04.	43	04,	52	05.	04	05.	15	05.	26
7	05.	07	05.	19	05.	30	05.	42	05.	55	06.	08	06.	21
8	05.	52	06.	05	06,	18	06.	32	06,	46	07.	01	07.	16
9	06.	36	06.	51	07.	06	07.	28	07.	38	07.	53	08.	12
10	07.	22	07.	38	07.	55	08.	13	08.	30	08.	49	09.	08
11	08.	07	08.	25	08.	44	09.	03	09.	23	09.	44	10.	05
12	08.	53	09.	13	09.	34	09.	55	10.	16	10,	39	11.	02
13	09,	39	10.	01	10.	14	10.	46	11.	10	11,	35	12,	00
14	10,	26	10.	50	11.	14	11.	39	12.	05	12.	31	12,	58
15	11.	14	11,	39	12,	05	12.	32	13.	00	13,	28	13.	58
16	12,	02	12.	29	12,	57	13.	26	13,	55	14.	26	14.	58
17	12,	50	13,	19	13.	49	14.	20	14.	52	15.	25	15.	59
18	13.	39	14,	10	14.	42	15,	15	15.	49	16.	24	17.	01
19	14,	29	15.	02	15.	36	16,	11	16.	48	17.	25	18.	04
20	15,	20	15.	55	16.	31	17,	08	17.	47	18,	27	19.	08
21	16,	11	16.	49	17,	27	18.	07	18.	47	19,	30	20.	13
22	17.	05	17,	44	18.	24	19,	06	19.	49	20.	34	21.	20
23	17,	58	18,	39	19.	22	20,	06	20.	52	21.	39	22.	28
24	18,	52	19.	36	20.	21	21.	08	21.	56	22.	46	23.	38
25	19.	48	20,	34	21.	21	22.	11	23.	02	23.	55	24.	50
26	20.	45	21.	34	22.	24	23.	16	24.	10	25,	05	26.	03
27	21.	44	22.	35	23.	28	24.	22	25,	19	26.	17	27.	18
28	22.	43	23.	37	24.	33	25.	30	26,	30	27.	31	28.	36
29	23.	45	24,	41	25,	40	26,	40	27.	43	28.	48	29.	57
30	24.	48	25.	47	26.	49	27.	52	28.	59	30.	07	30.	19
31	25,	53	26,	55	28.	00	29.	07	30.	17	31.	29	32.	45
32	27.	00	28.	05	29,	13	30,	54	31.	31	32.	54	34.	1

Degrees of Declination.

X

Poles	43	44	45	46	47	48	49
1	00. 56	00. 58	01. 00	01. 02	01. 04	01. 07	01. 09
2	01. 52	01. 56	02. 00	02. 04	02. 09	02. 13	02. 18
3	02. 48	02. 54	03. 00	03. 07	03. 13	03. 20	03. 27
4	03. 44	03. 52	04. 01	04. 09	04. 18	04. 47	04. 37
5	04. 41	04. 51	05. 01	05. 12	05. 23	05. 35	05. 47
6	05. 37	05. 50	06. 02	06. 15	06. 28	06. 42	06. 59
7	06. 34	06. 49	07. 03	07. 18	07. 34	07. 50	08. 07
8	07. 32	07. 48	08. 05	08. 22	08. 40	08. 59	09. 18
9	08. 30	08. 48	09. 07	09. 26	09. 47	10. 08	10. 30
10	09. 28	09. 48	10. 09	10. 31	10. 54	11. 18	11. 42
11	10. 27	10. 49	11. 13	11. 37	12. 02	12. 28	12. 55
12	11. 26	11. 51	12. 16	12. 43	13. 11	13. 39	14. 09
13	12. 26	12. 53	13. 21	13. 50	14. 20	14. 51	15. 24
14	13. 27	13. 56	14. 26	14. 58	15. 30	16. 05	16. 40
15	14. 28	15. 00	15. 32	16. 07	16. 42	17. 19	17. 57
16	15. 31	16. 05	16. 40	17. 16	17. 54	18. 34	19. 16
17	16. 34	17. 10	17. 48	18. 27	19. 08	19. 51	20. 36
18	17. 38	18. 17	18. 58	19. 40	20. 23	21. 09	21. 57
19	18. 44	19. 25	20. 09	20. 53	21. 40	22. 29	23. 20
20	19. 50	20. 35	21. 21	22. 08	22. 58	23. 51	24. 45
21	20. 59	21. 46	22. 34	23. 25	24. 18	25. 14	26. 12
22	22. 08	22. 58	23. 50	24. 44	25. 40	26. 40	27. 42
23	23. 19	24. 12	25. 07	26. 05	27. 05	28. 08	29. 14
24	24. 32	25. 28	26. 26	27. 27	28. 31	29. 38	30. 48
25	25. 47	26. 46	27. 48	28. 52	30. 00	31. 12	32. 26
26	27. 03	28. 06	29. 11	30. 20	31. 32	32. 48	34. 08
27	28. 22	29. 29	30. 38	31. 51	33. 07	34. 28	35. 53
28	29. 44	30. 54	32. 07	33. 25	34. 46	36. 12	37. 42
29	31. 08	32. 26	33. 40	35. 02	36. 28	38. 00	39. 37
30	32. 35	33. 53	35. 16	36. 43	38. 15	39. 53	41. 37
31	33. 58	35. 28	36. 56	38. 29	40. 07	41. 52	43. 44
32	35. 38	37. 07	38. 40	40. 19	42. 04	43. 57	45. 57

Degrees of Declination.

Elevation	50	51	52	53	54	55	56
1	01,12	01.14	01.17	01.20	01.23	01.26	01.29
2	02,23	02.28	02.34	02,39	02.45	02.51	02.58
3	03,35	03.43	03.51	03.59	04.08	04.17	04,27
4	04,47	04.57	05,08	05.19	05.31	05,44	05.57
5	05.59	06,12	06,26	06.40	06.55	07,11	07.27
6	07,12	07,27	07.44	08,01	08.19	08,38	08.58
7	08.25	08.43	09,02	09.23	09.44	10,16	10,29
8	09.38	10.00	10.22	10.45	11,09	11.35	12,01
9	10.53	11,17	11,42	12.08	12.35	13.04	13.35
10	12,08	12.35	13,03	13.32	14,03	14.35	15.09
11	13,24	13.53	14,24	14.57	15.31	16.07	16.45
12	14.40	15.13	15.47	16.23	17.01	17.40	18.22
13	15.58	16.34	17.11	17.05	18.32	19.15	20.01
14	17,17	17.56	18,37	17.19	20.04	20.52	21.42
15	18,37	19.19	20.04	20.50	21.38	22.30	23.24
16	19,59	20.44	21.32	22,22	23.15	24,10	25.09
17	21.22	22.11	23.02	23.56	24.53	25.53	26.57
18	22.47	23,39	24.34	25.33	26.34	27.39	28,48
19	24,14	25.10	26,09	27,11	28.17	29.27	30.41
20	25,43	26.43	27.46	28,53	30.04	31.19	32.39
21	27,14	28.18	29,26	30.37	31.54	33.15	34.41
22	28.48	29.56	31,08	32.25	33.47	35.14	36.48
23	30,24	31.37	32.54	34,17	35.45	37,19	39.00
24	32.03	33.21	34.44	36.13	37.48	39.29	41,18
25	33.46	45,10	36.39	38.14	39.56	41.45	43.44
26	35.32	37.03	38.38	40.20	42.10	44.09	46.18
27	37.23	39.00	40.42	42.33	44.42	46.41	49.04
28	39.19	41.02	42.53	44.53	47.02	49.24	52.01
29	41.21	43,12	45,12	47,21	49,44	52.20	55.16
30	43.29	45.29	47.39	50.01	52.37	55.32	58.52
31	45,44	47.54	50.16	52,53	55.48	59.06	62.58
32	48.08	50.30	53.07	56,01	59.19	63.10	67.53

Degrees of Declination.

S.	D.	1		2		3		4		5		6	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	003	38	003	36	003	35	003	33	003	32	003	29
	8	007	17	007	14	007	10	007	07	007	04	007	00
	12	010	57	010	52	010	46	010	41	010	36	010	32
	16	014	37	014	30	014	23	014	17	014	10	014	04
	20	018	19	018	10	018	02	017	54	017	46	017	37
	24	022	03	021	52	021	42	021	33	021	23	021	13
	28	025	48	025	37	025	25	025	14	025	03	024	50
♉	2	029	36	029	23	029	10	028	57	028	44	028	30
	6	033	26	033	11	032	57	032	43	032	27	032	13
	10	037	19	037	03	036	47	036	32	036	15	035	59
	14	041	14	040	57	040	39	040	22	040	05	039	47
	18	045	13	044	54	044	36	044	17	043	59	043	40
	22	049	15	048	54	048	35	048	15	047	55	047	35
	26	053	18	052	57	052	37	052	16	051	54	051	33
♊	0	057	26	057	04	056	42	056	20	055	57	055	35
	4	061	37	061	13	060	50	060	28	060	04	059	41
	8	065	50	065	25	065	02	064	38	064	13	063	50
	12	070	05	069	40	069	16	068	51	068	26	068	02
	16	074	22	073	57	073	32	073	07	072	41	072	16
	20	078	41	078	16	077	50	077	24	076	59	076	33
	24	083	01	082	36	082	10	081	44	081	18	080	52
	28	087	23	086	57	086	31	086	04	085	38	085	12
♋	2	091	45	091	19	090	53	090	27	090	02	089	35
	6	096	07	095	41	095	15	094	48	094	23	093	57
	10	100	27	100	02	099	36	099	10	098	45	098	19
	14	104	47	104	22	103	57	103	32	103	06	102	41
	18	109	06	108	41	108	17	107	52	107	27	107	03
	22	113	23	112	58	112	35	112	11	111	47	111	23
	26	117	38	117	14	116	51	116	28	116	05	115	42
♌	0	121	50	121	28	121	06	120	44	120	21	119	59

S.	D.	1		2		3		4		5		6	
♌	4	125	59	125	38	125	18	124	56	124	35	124	14
	8	130	06	129	45	129	26	129	06	128	46	128	26
	12	134	10	133	51	133	32	133	14	132	55	132	36
	16	138	11	137	54	137	37	137	19	137	02	136	45
	20	142	09	141	53	141	37	141	21	141	05	140	49
	24	146	05	145	51	145	37	145	22	145	07	144	51
	28	149	58	149	46	149	32	149	19	149	06	148	52
♍	2	153	49	153	38	153	26	153	15	153	03	152	51
	6	157	38	157	28	157	18	157	08	156	59	156	48
	10	161	25	161	16	161	08	161	00	160	52	160	43
	14	165	10	165	04	164	56	164	50	164	44	164	37
	18	168	54	168	49	168	43	168	38	168	34	168	29
	22	172	37	172	33	172	30	172	26	172	23	172	20
	26	176	19	276	17	176	16	176	14	176	12	176	10
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	183	41	183	43	183	44	183	46	183	48	183	50
	8	187	23	187	27	187	30	187	34	187	37	187	40
	12	191	06	191	11	191	17	191	22	191	26	191	31
	16	194	50	194	56	195	04	195	10	195	16	195	23
	20	198	35	198	44	198	52	199	00	199	08	199	17
	24	202	22	202	30	202	42	202	55	203	01	203	12
	28	206	11	206	22	206	34	206	45	206	57	207	09
♏	2	210	02	210	14	210	28	210	41	210	54	211	08
	6	213	55	214	09	214	23	214	38	214	53	215	09
	10	217	51	218	07	218	23	218	39	218	55	219	11
	14	221	49	222	06	222	23	222	41	222	58	223	15
	18	225	50	226	09	226	28	226	46	227	05	227	24
	22	229	54	230	15	230	34	230	54	231	14	231	34
	26	234	01	234	22	234	42	235	04	235	25	235	46
♐	0	238	10	238	38	238	54	239	16	239	39	240	01
	4	242	22	242	46	243	09	243	32	243	55	244	18

S.	D.	1		2		3		4		5		6	
♐	8	246	37	247	02	247	25	247	49	248	13	248	37
	12	250	54	251	19	251	43	252	08	252	33	252	57
	16	255	13	255	38	256	03	256	28	256	34	257	19
	20	259	33	259	58	260	24	260	50	261	15	261	41
	24	263	53	264	19	264	45	265	12	265	37	266	03
	28	268	15	268	41	269	07	269	33	269	59	270	25
♑	2	272	37	273	03	273	29	273	56	274	22	274	48
	6	276	59	277	24	277	50	278	16	278	42	279	08
	10	281	19	281	44	282	10	282	36	283	01	283	37
	14	285	38	286	03	286	28	286	53	287	19	287	44
	18	289	55	290	20	290	44	291	09	291	34	291	59
	22	294	10	294	35	294	58	295	22	295	47	296	10
	26	298	23	298	47	299	10	299	32	299	56	300	19
♒	0	302	34	302	56	303	18	303	40	304	03	304	25
	4	306	42	307	03	307	23	307	44	308	06	308	27
	8	310	45	311	06	311	25	311	45	312	05	312	25
	12	314	47	315	06	315	24	315	43	316	01	316	20
	16	318	46	319	03	319	21	319	38	319	55	320	13
	20	322	41	322	57	323	13	323	29	323	45	324	01
	24	326	34	326	49	327	03	327	17	327	33	327	47
	28	330	24	330	37	330	50	331	03	331	16	331	30
♓	2	334	12	334	23	334	35	334	46	334	57	335	10
	6	337	57	338	08	338	18	338	27	338	37	338	47
	10	341	41	341	50	341	58	342	06	342	14	342	23
	14	345	23	345	30	345	37	345	42	344	50	345	56
	18	349	03	349	08	349	14	349	19	349	24	349	28
	22	352	43	352	46	352	50	352	53	352	56	353	00
	26	356	22	356	24	356	25	356	27	346	28	356	31
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	7		8		9		10		11		12	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	003	28	003	26	003	24	003	23	003	21	003	20
	8	006	57	006	53	006	50	006	47	006	43	006	40
	12	009	26	010	21	010	16	010	11	010	06	010	00
	16	013	57	013	50	013	43	013	36	013	30	013	22
	20	017	29	017	20	017	12	017	03	016	55	016	46
	24	021	03	020	52	020	43	020	32	020	23	020	12
	28	024	39	024	28	024	16	024	04	023	52	023	40
♉	2	028	18	028	04	027	51	027	38	027	24	027	11
	6	031	59	031	43	031	29	031	14	030	59	030	44
	10	035	43	035	27	035	11	034	54	034	38	034	21
	14	039	30	039	12	038	55	038	37	038	19	038	01
	18	043	21	043	02	042	43	042	24	042	05	041	45
	22	047	15	046	55	046	34	046	14	045	54	045	32
	26	051	12	050	50	050	29	050	07	049	46	049	23
♊	0	055	12	054	50	054	28	054	05	053	42	053	19
	4	059	17	058	54	058	31	058	07	057	43	057	19
	8	063	25	063	02	062	37	062	12	061	48	061	22
	12	067	36	067	12	066	47	066	21	065	56	065	30
	16	071	51	071	25	070	59	070	32	070	07	069	41
	20	076	07	075	41	075	13	074	48	074	21	073	55
	24	080	25	079	59	079	32	079	05	078	38	078	11
	28	084	45	084	19	083	52	083	25	082	58	082	31
♋	2	089	07	088	41	088	14	087	47	087	20	086	33
	6	093	29	093	03	092	36	092	10	091	43	091	16
	10	097	53	097	27	097	00	096	34	096	07	095	41
	14	102	16	101	50	101	24	100	57	100	31	100	06
	18	106	38	106	13	105	48	105	22	104	57	104	31
	22	110	58	110	35	110	10	109	46	109	21	108	55
	26	115	18	114	55	114	32	114	08	113	44	113	19
♌	0	119	36	119	19	118	52	118	29	118	06	117	43

S.	D.	7		8		9		10		11		12	
♌	0	119	36	119	14	118	52	118	29	118	06	117	43
	4	123	52	123	31	123	10	122	48	122	26	122	04
	8	128	06	127	46	127	25	127	04	126	45	126	23
	12	132	18	131	58	131	39	131	20	131	01	130	41
	16	136	27	136	09	135	52	135	34	135	16	134	58
	20	140	33	140	17	140	01	139	45	139	28	139	11
	24	144	38	144	23	144	09	143	54	143	39	143	23
	28	148	40	148	27	148	13	148	01	147	47	147	33
♍	2	152	40	152	28	152	17	152	05	151	53	151	41
	6	156	39	156	28	156	18	156	08	155	58	155	48
	10	160	35	160	26	160	18	160	09	160	01	159	52
	14	164	30	164	23	164	16	164	09	164	03	163	56
	18	168	24	168	18	168	13	168	08	168	03	167	58
	22	172	16	172	13	172	09	172	06	172	03	171	59
	26	176	08	176	07	176	05	176	04	176	02	176	00
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	183	52	183	53	183	55	183	56	183	58	184	00
	8	187	44	187	47	187	51	187	44	187	57	188	01
	12	191	36	191	42	191	47	191	52	191	57	192	02
	16	195	30	195	37	195	44	195	51	195	57	196	04
	20	199	25	199	34	199	43	199	51	199	59	200	08
	24	203	21	203	32	203	42	203	52	204	02	204	12
	28	207	20	207	32	207	42	207	55	208	07	208	19
♏	2	211	20	211	33	211	46	211	59	212	13	212	27
	6	215	22	215	37	215	51	216	06	216	21	216	37
	10	219	27	219	43	219	59	220	15	220	32	220	49
	14	223	33	223	51	224	08	224	26	224	44	225	02
	18	227	42	228	02	228	21	228	40	228	59	229	19
	22	231	54	232	14	232	35	232	56	233	15	233	37
	26	236	08	236	29	236	50	237	12	237	34	237	56
♐	0	240	24	240	46	241	08	241	31	241	54	242	17

S.	D.	7		8		9		10		11		12	
♐	0	240	24	240	46	241	08	241	31	241	54	242	17
	4	244	42	245	05	245	25	245	52	246	16	246	41
	8	249	02	249	25	249	50	250	14	250	39	251	05
	12	253	22	253	47	254	12	254	38	255	03	255	29
	16	257	44	258	10	258	36	259	02	259	29	259	54
	20	262	07	262	33	263	00	263	26	263	53	264	19
	24	266	31	266	57	267	24	267	50	268	17	268	44
	28	270	53	271	19	271	46	272	13	272	40	273	07
♑	2	275	15	275	41	276	08	276	35	277	02	277	29
	6	279	35	280	02	280	28	280	55	281	22	281	49
	10	283	53	284	19	284	47	285	12	285	39	286	05
	14	288	09	288	35	289	01	289	28	289	53	290	19
	18	292	24	292	48	293	13	293	39	294	04	294	30
	22	296	35	296	58	297	23	297	48	298	12	298	38
	26	300	43	301	06	301	29	301	53	302	17	302	41
♒	0	304	48	305	10	305	32	305	55	306	18	306	41
	4	308	48	309	10	309	31	309	53	310	14	313	37
	8	312	45	313	05	313	26	313	46	314	06	314	28
	12	316	39	316	58	317	17	317	36	317	55	318	15
	16	320	30	320	48	321	05	321	23	321	41	321	59
	20	324	17	324	33	324	49	325	06	325	22	325	39
	24	328	02	328	17	328	31	328	46	329	01	329	16
	28	331	42	331	56	332	09	332	22	332	36	332	49
♓	2	335	21	335	32	335	44	335	56	336	08	336	20
	6	338	57	339	08	339	17	339	28	339	37	339	48
	10	342	31	342	40	342	48	342	57	343	05	343	14
	14	346	03	346	10	346	17	346	24	346	30	346	38
	18	349	34	349	39	349	44	349	49	349	54	350	00
	22	353	03	353	07	353	10	353	13	353	17	353	20
	26	356	32	356	34	356	36	356	37	356	39	356	40
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	13		14		15		16		17		18	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	003	17	003	16	003	14	003	12	003	10	003	08
	8	006	36	006	33	006	29	006	26	006	22	006	18
	12	009	56	009	50	009	45	009	40	009	34	009	28
	16	013	16	013	09	013	02	012	55	012	47	012	40
	20	016	38	016	29	016	20	016	11	016	02	015	53
	24	020	02	019	51	019	40	019	30	019	19	019	09
	28	023	28	023	16	023	04	022	51	022	39	022	27
♉	2	026	57	026	43	026	29	026	15	026	02	025	47
	6	030	28	030	13	029	58	029	42	029	27	029	10
	10	034	04	033	48	033	31	033	13	032	56	032	38
	14	037	43	037	24	037	06	036	47	036	28	036	09
	18	041	26	041	06	040	46	040	26	040	05	039	44
	22	045	12	044	50	044	29	044	08	043	46	043	24
	26	049	01	048	39	048	17	047	54	047	31	047	07
Ⅱ	0	052	55	052	32	052	09	051	45	051	20	050	56
	4	056	55	056	30	056	05	055	41	055	15	054	50
	8	060	58	060	32	060	06	059	40	059	15	058	48
	12	065	04	064	38	064	12	063	45	063	17	062	50
	16	069	14	068	48	068	21	067	53	067	55	066	57
	20	073	28	073	00	072	33	072	05	071	37	071	09
	24	077	44	077	16	076	49	076	21	075	53	075	24
	28	082	04	081	36	081	08	080	40	080	12	079	43
♋	2	086	25	085	57	085	30	085	01	084	33	084	04
	6	090	49	090	21	089	54	089	25	088	57	088	28
	10	095	14	094	46	094	19	093	51	093	23	092	55
	14	099	39	099	12	098	46	098	18	097	50	097	22
	18	104	05	103	39	103	13	102	46	102	18	101	52
	22	108	31	108	05	107	40	107	14	106	48	106	21
	26	112	55	112	31	112	06	111	41	111	16	110	51
♌	0	117	19	116	56	116	33	116	09	115	44	115	20

S.	D.	13		14		15		16		17		18	
♌	0	117	19	116	56	116	33	116	09	115	44	115	20
	4	121	42	121	20	120	57	120	35	120	12	119	48
	8	126	02	125	42	125	20	124	59	124	37	124	15
	12	130	22	130	02	129	42	129	22	129	02	128	41
	16	134	40	134	22	134	03	133	44	133	26	133	06
	20	138	54	138	38	138	21	138	03	137	46	137	28
	24	143	08	142	53	142	37	142	22	142	06	141	50
	28	147	19	147	05	146	52	146	38	146	24	146	10
♍	2	151	29	151	17	151	04	150	52	150	40	150	28
	6	155	27	155	27	155	16	155	06	154	55	154	44
	10	159	44	159	35	159	26	159	17	159	08	158	59
	14	163	49	163	42	163	34	163	28	163	20	163	13
	18	167	53	167	48	167	42	167	37	167	31	167	25
	22	171	56	171	52	171	49	171	45	171	41	171	37
	26	175	58	175	56	175	55	175	53	175	51	175	49
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	184	02	184	04	184	05	184	07	184	09	184	11
	8	188	04	188	08	188	11	188	15	188	19	188	23
	12	192	07	192	12	192	18	192	23	192	29	192	35
	16	196	11	196	18	196	26	196	32	196	40	196	47
	20	200	16	200	25	200	34	200	43	200	52	201	01
	24	204	23	204	33	204	44	204	55	205	05	205	16
	28	208	31	208	43	208	56	209	08	209	20	209	32
♏	2	212	41	212	55	213	08	213	22	213	36	213	50
	6	216	52	217	07	217	23	217	38	217	54	218	10
	10	221	06	221	22	221	39	221	57	222	14	222	32
	14	225	20	225	38	225	57	226	16	226	34	226	54
	18	229	38	229	58	230	18	230	38	230	58	231	19
	22	233	58	234	18	234	40	235	01	235	23	235	45
	26	238	18	238	40	239	03	239	26	239	48	240	12
♐	0	242	41	243	04	243	27	243	51	244	16	244	40

L 2

S.	D.	13		14		15		16		17		18	
♐	0	242	41	243	04	243	27	243	51	244	16	244	40
	4	247	05	247	29	247	54	248	19	248	44	249	09
	8	251	29	251	55	252	20	252	46	253	12	253	39
	12	255	55	256	21	256	47	257	14	257	42	258	08
	16	260	21	260	48	261	14	261	42	262	10	262	38
	20	264	46	265	14	265	41	266	09	266	37	267	05
	24	269	11	269	39	270	06	270	35	271	03	271	32
	28	273	35	274	03	274	30	274	59	275	27	275	56
♑	2	277	56	278	24	278	52	279	20	279	48	280	17
	6	282	16	282	44	283	11	283	39	284	07	284	36
	10	286	32	287	00	287	27	287	55	288	23	288	51
	14	290	46	291	12	291	39	292	07	292	35	293	03
	18	294	56	295	22	295	48	296	15	296	43	297	10
	22	299	02	299	28	299	54	300	20	300	45	301	12
	26	303	05	303	30	303	55	304	19	304	55	305	10
♒	0	307	05	307	28	307	51	308	15	308	40	309	04
	4	310	59	311	21	311	43	312	06	312	29	312	53
	8	314	48	315	10	315	31	315	55	316	14	316	36
	12	318	37	318	54	319	14	319	34	319	55	320	16
	16	322	17	322	36	322	54	323	13	323	32	323	51
	20	325	56	326	12	326	29	326	47	327	04	327	22
	24	329	32	329	47	330	02	330	18	330	33	330	50
	28	333	03	333	17	333	31	333	45	333	58	334	13
♓	2	336	32	336	44	336	56	337	09	337	21	337	33
	6	339	58	340	09	340	20	340	30	340	41	340	51
	10	343	22	343	31	343	40	343	49	343	58	344	07
	14	346	44	346	51	346	59	347	05	347	13	347	20
	18	350	04	350	10	350	15	350	20	350	26	350	32
	22	353	24	353	27	353	31	353	34	353	38	353	42
	26	356	43	356	44	356	46	356	48	356	50	356	52
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	19		20		21		22		23		24	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	003	07	003	05	003	03	003	01	002	59	002	57
	8	006	15	006	11	006	07	006	03	005	59	005	55
	12	009	23	009	17	009	11	009	06	009	00	008	54
	16	012	32	012	25	012	17	012	10	012	02	011	54
	20	015	44	015	35	015	25	015	16	015	06	014	56
	24	018	58	018	47	018	35	018	24	018	12	018	00
	28	022	14	022	01	021	48	021	35	021	21	021	08
♉	2	025	23	025	18	025	03	024	48	024	33	024	18
	6	028	55	028	39	028	21	028	05	027	48	027	31
	10	032	21	032	03	031	44	031	26	031	07	030	48
	14	035	50	035	31	035	10	034	50	034	30	034	09
	18	039	24	039	03	038	41	038	20	037	57	037	36
	22	043	02	042	40	042	17	041	54	041	30	041	06
	26	046	44	046	20	045	56	045	32	045	07	044	41
♊	0	050	31	050	06	049	41	049	15	048	49	048	22
	4	054	24	053	58	053	32	053	04	052	38	052	09
	8	058	21	057	54	057	27	056	58	056	30	056	01
	12	062	23	061	55	061	27	060	58	060	28	059	59
	16	066	29	066	01	065	32	065	03	064	32	064	02
	20	070	40	070	11	069	41	069	11	068	40	068	09
	24	074	55	074	25	073	55	073	25	072	54	072	22
	28	079	13	078	44	078	13	077	42	077	12	076	40
♋	2	083	35	083	05	082	35	082	04	081	34	081	02
	6	087	59	087	29	086	59	086	29	085	58	085	27
	10	092	26	091	57	091	27	090	57	090	20	089	55
	14	096	54	096	2	095	56	095	29	094	57	094	26
	18	101	2	100	55	100	28	099	59	099	29	098	59
	22	105	55	105	26	105	00	104	31	104	03	103	34
	26	110	25	109	58	109	32	109	05	108	38	108	10
♌	0	114	55	114	30	114	05	113	39	113	30	112	46

S.	D.	19		20		21		22		23		24	
♌	0	114	55	114	30	114	05	113	39	113	30	112	46
	4	119	25	119	01	118	37	118	12	117	48	117	22
	8	123	53	123	31	123	08	122	44	122	21	121	57
	12	128	20	128	00	127	38	127	16	126	54	126	32
	16	132	47	132	28	132	07	131	48	131	27	131	06
	20	137	11	136	53	136	34	136	16	135	57	135	38
	24	141	35	141	18	141	01	140	44	140	28	140	10
	28	145	55	145	51	145	25	145	11	144	56	144	40
♍	2	150	15	150	02	149	49	149	35	149	22	149	08
	6	154	34	154	22	154	11	153	59	153	48	153	36
	10	158	50	158	41	158	31	158	32	158	12	158	02
	14	163	06	162	58	162	51	162	43	162	36	162	27
	18	167	20	167	14	167	09	167	03	166	58	166	51
	22	171	34	171	30	171	26	171	23	171	19	171	15
	26	175	48	175	46	175	44	175	42	175	40	175	38
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	184	12	184	14	184	16	184	18	184	20	184	21
	8	188	26	188	30	188	34	188	37	188	41	188	45
	12	192	40	192	46	192	51	192	57	193	02	193	09
	16	196	54	197	02	197	09	197	17	197	24	197	33
	20	201	10	201	19	201	29	201	38	201	48	201	58
	24	205	26	205	38	205	49	206	01	206	12	206	24
	28	209	45	209	58	210	11	210	25	210	38	210	52
♏	2	214	05	214	19	214	35	214	49	215	04	215	20
	6	218	25	218	42	218	59	219	16	219	32	219	50
	10	222	49	223	07	223	26	223	44	224	03	224	22
	14	227	13	227	32	227	53	228	12	228	33	228	54
	18	231	40	232	00	232	22	232	44	233	06	233	08
	22	236	07	236	29	236	52	237	16	237	39	238	03
	26	240	35	240	59	241	23	241	48	242	12	242	38
♐	0	245	05	245	30	245	55	246	21	246	47	247	14

S.	D.	19		20		21		22		23		24	
♐	0	245	05	245	30	245	55	246	21	246	47	247	14
	4	249	35	250	02	250	28	250	55	251	22	251	50
	8	254	05	254	34	255	00	255	29	255	57	256	26
	12	258	36	259	05	259	32	260	01	260	31	261	01
	16	263	06	263	35	264	04	264	33	265	03	265	34
	20	267	34	268	03	268	33	269	03	269	34	270	05
	24	272	01	272	31	273	01	273	31	274	02	274	33
	28	276	25	276	55	277	25	277	50	278	26	278	58
♑	2	280	47	281	16	281	47	282	18	282	48	283	20
	6	285	05	285	35	286	05	286	35	287	06	287	38
	10	289	20	289	49	290	19	290	49	291	20	291	51
	14	293	31	293	59	294	28	294	57	295	28	295	59
	18	297	57	298	05	298	33	299	02	299	32	300	01
	22	301	39	302	06	302	33	303	02	303	30	303	59
	26	305	36	306	02	306	28	306	56	307	22	307	51
♒	0	309	29	309	54	310	19	310	45	311	11	311	38
	4	313	16	313	40	314	04	314	28	314	53	315	19
	8	316	58	317	20	317	43	318	06	318	30	318	54
	12	320	36	320	57	321	19	321	40	322	03	322	24
	16	324	10	324	29	324	50	325	10	325	30	325	51
	20	327	39	327	57	328	16	328	34	328	53	329	12
	24	331	05	331	21	331	39	331	55	332	12	332	29
	28	334	27	334	42	334	57	335	12	335	29	335	42
♓	2	337	46	337	59	338	12	338	25	338	39	338	52
	6	341	02	341	13	341	25	341	36	341	48	342	00
	10	344	16	344	25	344	35	344	44	344	54	345	04
	14	347	28	347	35	347	43	347	50	347	58	348	06
	18	350	37	350	43	350	49	350	54	351	00	351	06
	22	353	45	353	49	353	53	353	57	354	01	354	05
	26	356	53	356	55	356	57	356	56	357	01	357	03
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	25		26		27		28		29		30	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	002	53	002	57	002	51	002	48	002	47	002	44
	8	005	51	005	47	005	43	005	38	005	35	005	30
	12	008	48	008	42	008	35	008	29	008	23	008	16
	16	011	46	011	38	011	30	011	21	011	12	011	04
	20	014	46	014	36	014	26	014	15	014	04	013	54
	24	017	49	017	36	017	24	017	11	016	59	016	46
	28	020	54	020	40	020	25	020	11	019	55	019	41
♉	2	024	01	023	46	023	29	023	13	022	55	022	39
	6	027	13	026	55	026	37	026	18	026	00	025	40
	10	030	29	030	09	029	49	029	29	029	08	028	47
	14	033	49	033	27	033	04	032	43	032	19	031	57
	18	037	13	036	50	036	26	036	02	035	37	035	13
	22	040	42	040	17	039	53	039	27	039	00	038	34
	26	044	15	043	50	043	22	042	56	042	28	042	00
♊	0	047	54	047	28	047	00	046	31	046	02	045	32
	4	051	41	051	12	050	43	050	13	049	43	049	12
	8	055	32	055	02	054	32	054	00	053	29	052	57
	12	059	29	058	58	058	26	057	54	057	21	056	49
	16	063	31	062	59	062	27	061	55	061	20	060	47
	20	067	38	067	06	066	33	066	00	065	26	064	51
	24	071	50	071	18	070	45	070	11	069	37	069	02
	28	076	08	075	35	075	02	074	28	073	53	073	18
♋	2	080	30	079	57	079	24	078	50	078	15	077	40
	6	084	55	084	23	083	50	083	16	082	41	082	06
	10	089	24	088	52	088	19	087	46	087	12	086	37
	14	093	56	093	24	092	51	092	19	091	45	091	11
	18	098	29	097	59	097	27	096	55	096	21	095	49
	22	103	05	102	35	102	05	101	33	101	02	100	29
	26	107	41	107	12	106	44	106	13	105	43	105	12
♌	0	112	18	111	52	111	24	110	55	110	26	109	56

S.	D.	25		26		27		28		29		30	
♌	0	112	18	111	52	111	24	110	55	110	26	109	56
	4	116	56	116	31	116	04	115	37	115	09	114	40
	8	121	33	121	09	120	43	120	18	119	51	119	24
	12	126	10	125	47	125	23	124	59	124	34	124	09
	16	130	46	130	24	130	02	129	48	129	17	128	54
	20	135	19	134	59	134	39	134	19	133	58	133	37
	24	139	52	139	45	139	17	138	58	138	39	138	20
	28	144	24	144	08	143	52	143	39	143	18	143	02
♍	2	148	55	148	40	148	26	148	11	147	57	147	41
	6	153	24	153	12	153	00	152	47	152	34	152	21
	10	157	52	157	42	157	32	157	21	157	10	157	02
	14	162	20	162	11	162	03	161	54	161	46	161	37
	18	166	46	166	39	166	33	166	26	166	20	166	13
	22	171	11	171	07	170	02	170	58	170	54	170	49
	26	175	36	175	34	175	32	175	29	175	18	175	25
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	184	24	184	26	184	28	184	31	184	32	184	35
	8	188	49	188	53	188	58	189	02	189	06	189	11
	12	193	14	193	21	193	27	193	34	193	40	193	47
	16	197	40	197	49	197	57	198	06	198	14	198	23
	20	202	08	202	18	202	28	202	38	202	50	202	59
	24	206	36	206	48	207	00	207	13	207	26	207	39
	28	211	05	211	20	211	34	211	49	212	03	212	19
♏	2	215	36	215	52	216	08	216	25	216	42	216	59
	6	220	08	220	25	220	43	221	02	221	21	221	40
	10	224	41	224	02	225	21	225	41	226	02	226	23
	14	229	14	229	36	229	58	230	20	230	43	231	06
	18	233	50	234	13	234	37	235	01	235	26	235	51
	22	238	27	238	51	239	17	239	42	240	09	240	36
	26	243	04	243	29	243	56	244	23	244	51	245	20
	30	247	42	248	08	248	36	249	05	249	34	250	04

M

S.	D.	25		26		27		28		29		30	
♐	0	247	42	248	08	248	36	249	05	249	34	250	04
	4	252	19	252	48	253	16	253	47	254	17	254	48
	8	256	55	257	15	257	55	258	27	258	58	259	31
	12	261	31	262	01	262	33	263	05	263	38	264	11
	16	266	04	266	36	267	09	267	41	268	15	268	49
	20	270	36	271	08	271	41	272	14	272	48	273	23
	24	274	05	275	37	276	40	276	44	277	19	277	54
	28	279	30	280	03	280	36	281	10	281	45	282	20
♑	2	283	52	284	25	284	58	285	32	286	07	286	42
	6	288	10	288	42	289	15	289	49	290	23	290	58
	10	292	22	292	54	293	27	294	00	294	34	295	09
	14	296	29	297	01	297	33	298	05	298	40	299	13
	18	300	31	301	02	301	34	302	06	302	39	303	11
	22	304	28	304	59	305	28	306	00	306	31	307	03
	26	308	19	308	48	309	17	309	47	310	17	310	48
♒	0	312	06	312	32	313	00	313	29	313	29	313	58
	4	314	28	315	45	316	10	316	38	317	04	317	32
	8	319	19	319	48	320	03	320	37	321	00	321	26
	12	320	47	323	10	323	34	323	58	324	23	324	47
	16	326	11	326	33	326	56	327	16	327	41	328	03
	20	329	31	329	51	330	11	330	31	330	52	331	13
	24	332	47	333	05	333	23	333	42	334	00	334	20
	28	335	59	336	14	336	31	336	47	337	05	337	21
♓	2	339	06	339	20	339	35	339	49	340	05	340	19
	6	342	11	342	24	342	36	342	49	343	01	343	14
	10	345	14	345	24	345	34	345	45	345	56	346	06
	14	348	14	348	22	348	30	348	39	348	48	348	56
	18	351	12	351	18	351	25	351	31	351	37	351	44
	22	354	09	354	13	354	17	354	22	354	25	354	30
	26	357	05	357	07	357	09	357	12	357	13	357	16
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	31		32		32.11		33		34		35	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	002	42	002	40	002	39	002	37	002	35	002	32
	8	005	26	005	21	005	20	005	16	005	11	005	06
	12	008	10	008	03	008	02	007	56	007	48	007	41
	16	010	55	010	47	010	44	010	36	010	27	010	17
	20	013	42	013	31	013	28	013	19	013	07	012	55
	24	016	32	016	19	016	15	016	04	015	51	015	35
	28	019	25	019	10	019	05	018	52	018	37	018	19
♉	2	022	21	022	04	021	59	021	44	021	26	021	07
	6	025	20	025	01	024	56	024	40	024	19	023	57
	10	028	25	028	03	027	56	027	40	027	17	026	53
	14	031	33	031	09	031	03	030	44	030	19	029	53
	18	034	47	034	21	034	15	033	54	033	27	032	59
	22	038	06	037	39	037	32	037	10	036	41	036	10
	26	041	31	041	02	040	55	040	31	040	00	039	52
♊	0	045	02	044	31	044	24	043	59	043	26	042	52
	4	048	40	048	07	047	59	047	33	047	00	046	24
	8	052	24	051	50	051	42	051	15	050	40	050	03
	12	056	14	055	38	055	31	055	03	054	26	053	49
	16	060	12	059	36	059	27	058	59	058	21	057	42
	20	064	15	063	39	063	31	063	01	062	23	061	43
	24	068	25	067	48	067	31	067	10	066	31	065	51
	28	072	41	072	04	071	56	071	26	070	47	070	05
♋	2	077	02	076	25	076	18	075	48	075	09	074	28
	6	081	29	080	53	080	45	080	15	079	36	078	56
	10	086	01	085	25	085	17	084	47	084	09	083	29
	14	090	37	090	01	089	53	089	23	088	46	088	07
	18	095	16	094	40	094	33	094	04	093	28	092	50
	22	099	57	099	23	099	16	098	48	098	13	097	36
	26	104	40	104	07	104	01	103	34	103	00	102	24
♌	0	109	26	108	55	108	48	108	23	108	50	107	16

S.	D.	31		32		32,11		33		34		35	
♌	0	109	26	108	55	108	48	108	23	107	50	107	16
	4	114	11	113	42	113	35	113	41	112	40	112	08
	8	118	57	118	29	118	24	118	01	117	31	117	02
	12	123	43	123	17	123	13	122	51	122	23	121	55
	16	128	31	128	06	128	01	127	42	127	16	126	51
	20	133	15	132	53	132	49	132	30	132	07	131	43
	24	138	00	137	41	137	36	137	19	136	59	136	37
	28	142	44	142	26	142	21	142	07	141	49	141	29
♍	2	147	26	147	10	147	07	146	54	146	38	146	21
	6	152	08	151	54	151	50	151	40	151	26	151	11
	10	156	48	156	37	156	34	156	25	156	13	156	01
	14	161	28	161	19	161	16	161	09	161	00	160	50
	18	166	07	166	00	165	58	165	53	165	46	165	38
	22	170	48	170	40	170	39	170	36	170	31	170	26
	26	175	23	175	20	175	19	175	18	175	16	175	13
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	184	37	184	40	184	41	184	42	184	44	184	47
	8	189	15	189	20	189	21	199	24	189	29	189	34
	12	193	53	194	00	194	02	194	07	194	14	194	22
	16	198	32	198	41	198	44	198	51	199	00	199	10
	20	203	12	203	23	203	26	203	35	203	47	203	59
	24	207	52	208	06	208	09	208	20	208	34	208	49
	28	212	34	212	50	212	53	213	06	213	22	213	39
♏	2	217	16	217	34	217	39	217	53	218	11	218	31
	6	222	00	222	19	222	24	222	41	223	01	223	23
	10	226	45	227	07	227	10	227	30	227	53	228	17
	14	231	29	231	54	231	59	232	18	232	44	233	09
	18	236	17	236	43	236	47	237	09	237	37	238	05
	22	241	03	241	31	241	36	241	59	242	29	242	59
	26	245	49	246	18	246	25	246	49	247	20	247	52
	30	250	34	251	05	251	12	251	37	252	10	252	44

S.	D.	31		32		32.11		33		34		35	
♐	0.	250	34	251	05	251	12	251	37	252	10	252	44
	4	255	20	255	53	255	59	256	26	257	00	257	36
	8	160	03	260	37	260	44	261	12	261	47	262	24
	12	264	44	265	20	265	27	265	55	266	32	267	10
	16	269	23	269	59	270	07	270	37	271	14	271	53
	20	273	59	274	35	274	43	275	13	275	51	276	31
	24	278	31	279	07	279	15	279	45	280	24	281	04
	28	282	58	283	35	283	42	284	12	284	51	285	32
♑	2	287	19	287	56	288	04	288	34	289	13	289	55
	6	291	35	292	12	292	19	292	15	293	29	294	09
	10	295	45	296	21	296	29	296	59	297	37	298	17
	14	299	48	300	24	300	33	301	04	301	39	302	18
	18	303	46	304	22	304	29	304	57	305	34	306	11
	22	307	36	308	10	308	18	308	45	309	20	309	57
	26	311	20	311	53	312	01	312	27	313	00	313	36
♒	0	314	58	315	29	315	36	316	01	316	34	317	08
	4	318	29	318	58	319	05	319	29	320	00	320	32
	8	321	54	322	21	322	28	322	50	323	19	323	50
	12	325	13	325	39	325	45	326	06	326	33	327	01
	16	328	28	328	51	328	57	329	16	329	41	330	07
	20	331	35	331	57	332	03	332	20	332	43	333	07
	24	334	40	334	59	335	04	335	20	335	41	336	03
	28	337	39	337	56	338	01	338	16	338	34	338	53
♓	2	340	35	340	50	340	55	341	08	341	23	341	41
	6	343	28	343	41	343	44	343	56	344	09	344	25
	10	346	18	346	29	346	32	346	41	346	53	347	05
	14	349	05	349	14	349	16	349	24	349	33	349	43
	18	351	50	351	57	351	59	352	04	352	12	352	19
	22	354	24	354	39	354	40	354	44	354	49	354	54
	26	357	18	357	20	357	21	357	23	357	25	357	28
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	36	37	38	39	40	41
	0	000 00	000 00	000 00	000 00	000 00	000 00
	4	002 30	002 28	002 25	002 22	002 20	002 16
	8	005 02	004 56	004 51	004 46	004 40	004 34
	12	007 34	007 26	007 18	007 10	007 01	006 53
	16	010 07	009 57	009 46	009 35	009 24	009 13
	20	012 43	012 30	012 17	012 03	011 48	011 35
	24	015 21	015 06	014 49	014 34	014 16	013 59
	28	018 02	017 45	017 25	017 07	016 48	016 28
♊	2	020 46	020 27	020 05	019 44	019 22	018 59
	6	023 35	023 12	022 49	022 25	022 00	021 34
	10	026 29	026 03	025 38	025 11	024 44	024 15
	14	029 26	028 58	028 31	028 02	027 32	027 01
	18	032 33	032 00	031 30	030 58	030 26	029 53
	22	035 40	035 08	034 35	034 02	033 27	032 52
	26	038 56	038 21	037 46	037 11	036 34	035 56
Π	0	042 18	041 42	041 06	040 28	039 49	039 09
	4	045 48	045 11	044 32	043 54	043 12	042 30
	8	049 25	048 47	048 06	047 26	046 43	046 00
	12	053 09	052 30	051 49	051 06	050 23	049 38
	16	057 03	056 22	055 39	054 56	054 11	053 25
	20	061 03	060 21	059 38	058 53	058 07	057 20
	24	065 10	064 28	063 44	062 59	062 12	061 24
	28	069 24	068 42	067 58	067 13	066 26	065 38
♋	2	073 47	073 04	072 20	071 35	070 47	069 59
	6	078 15	077 33	076 49	076 04	075 17	074 29
	10	082 49	082 07	081 24	080 39	079 53	079 06
	14	087 28	086 46	086 04	085 21	084 35	083 49
	18	092 11	091 31	090 50	090 08	089 29	088 39
	22	096 58	096 19	095 40	094 59	094 17	093 33
	26	101 49	101 11	100 33	099 54	099 13	098 31
♌	0	106 42	106 06	105 30	104 52	104 13	103 33

S.	D.	36		37		38		39		40		42	
♌	0	106	42	106	06	105	30	104	52	104	13	103	33
	4	111	36	111	02	110	27	109	52	109	15	108	37
	8	116	30	115	59	115	26	114	53	114	18	113	42
	12	121	26	120	57	120	27	119	55	119	22	118	49
	16	125	23	125	56	125	28	124	59	124	28	123	57
	20	131	19	130	53	130	28	130	01	129	34	129	05
	24	136	15	135	52	135	28	135	05	134	40	134	14
	28	141	09	140	49	140	28	140	07	139	44	139	22
♍	2	146	03	145	45	145	27	145	08	144	48	144	29
	6	150	57	150	41	150	25	150	09	149	52	149	35
	10	155	49	155	36	155	23	155	09	154	54	154	41
	14	160	41	160	30	160	19	160	09	159	57	159	46
	18	165	31	165	23	165	15	165	07	164	59	164	50
	22	170	21	170	16	170	10	170	05	170	00	169	53
	26	175	11	175	08	175	06	175	03	175	00	174	57
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	184	49	184	52	184	54	184	57	185	00	185	03
	8	189	39	189	44	189	50	189	55	190	00	190	07
	12	194	29	194	37	194	45	194	53	195	01	195	10
	16	199	19	199	30	199	41	199	51	200	03	200	14
	20	204	11	204	24	204	37	204	51	205	05	205	19
	24	209	03	209	19	209	35	209	51	210	08	210	25
	28	213	57	214	15	214	33	214	52	215	12	215	31
♏	2	218	51	219	11	219	32	219	53	220	19	220	38
	6	223	45	224	08	224	32	224	55	225	23	225	46
	10	228	41	229	07	229	32	229	59	230	26	230	55
	14	233	37	234	04	234	32	235	01	235	32	236	03
	18	238	34	239	03	239	33	240	05	240	28	241	11
	22	243	30	244	01	244	34	245	07	245	44	246	18
	26	248	24	248	58	249	33	250	08	250	45	251	23
	30	253	18	253	54	254	30	255	08	255	47	256	27

S.	D.	36		37		38		39		40		41	
♐	0	253	18	253	54	254	30	255	08	255	47	256	27
	4	258	11	258	49	259	26	260	06	260	47	261	29
	8	263	02	263	41	264	20	265	01	265	43	266	27
	12	267	49	268	29	269	10	269	52	270	36	271	21
	16	272	32	273	14	273	56	274	39	275	25	276	11
	20	277	11	277	53	278	36	279	21	280	07	280	54
	24	281	45	282	27	283	11	283	56	284	43	285	31
	28	286	13	286	56	287	40	288	55	289	13	290	01
♑	2	290	36	291	18	291	02	292	47	293	34	294	22
	6	294	50	295	32	296	16	297	01	297	48	298	36
	10	298	57	299	39	300	22	301	07	301	53	302	40
	14	302	57	303	38	304	21	305	04	305	49	306	35
	18	306	51	307	30	308	11	308	54	309	37	310	22
	22	310	35	311	13	311	54	312	34	313	17	314	00
	26	314	12	314	49	315	28	316	06	316	48	317	30
♒	0	317	42	318	18	318	54	319	32	320	11	320	51
	4	321	04	321	39	322	13	322	49	323	27	324	04
	8	324	20	324	52	325	25	325	58	326	33	327	08
	12	327	30	328	00	328	30	329	02	329	34	330	07
	16	330	34	331	02	331	29	331	58	332	28	332	59
	20	333	31	333	57	334	22	334	49	335	16	335	45
	24	336	25	336	48	337	11	337	35	338	00	338	26
	28	339	14	339	33	339	55	340	16	340	38	341	01
♓	2	341	58	342	15	342	35	342	53	343	12	343	32
	6	344	39	344	54	345	11	345	26	345	44	346	01
	10	347	17	347	30	347	43	347	57	348	12	348	25
	14	349	53	350	03	350	14	350	25	350	36	350	47
	18	352	26	352	34	352	42	352	50	352	59	353	07
	22	354	58	355	04	355	09	355	14	355	20	355	26
	26	357	30	357	32	357	35	357	38	357	40	357	44
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	42		43		44		45		46		47	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	002	13	002	11	002	08	002	04	002	00	001	55
	8	004	28	004	22	004	16	004	05	004	02	003	55
	12	006	44	006	34	006	25	006	15	006	05	005	55
	16	009	00	008	48	008	36	008	23	008	09	007	55
	20	011	20	011	04	010	49	010	32	010	15	009	58
	24	013	42	013	24	013	05	012	44	012	24	012	03
	28	016	07	015	46	015	24	015	01	014	37	014	12
♉	2	018	36	018	12	017	46	017	20	016	53	016	25
	6	021	08	020	41	020	12	019	43	019	13	018	41
	10	023	46	023	16	022	45	022	12	021	39	021	04
	14	026	29	025	56	025	22	024	47	024	10	023	31
	18	029	18	028	44	028	06	027	28	026	47	026	05
	22	032	15	031	37	030	57	030	15	029	33	028	48
	26	035	16	034	35	033	53	033	10	032	23	031	46
♊	0	038	27	037	44	036	59	036	13	035	24	034	34
	4	041	46	041	02	040	14	039	25	038	34	037	41
	8	045	13	044	27	043	38	042	47	041	52	040	58
	12	048	51	048	02	047	11	046	18	045	24	044	25
	16	052	36	051	46	050	53	049	59	049	03	048	03
	20	056	30	055	39	054	46	053	50	052	53	051	52
	24	060	34	059	43	058	48	057	52	056	53	055	52
	28	064	42	063	55	063	01	062	04	061	04	060	03
♋	2	069	02	068	17	067	21	066	26	065	27	064	25
	6	073	39	072	47	071	53	070	56	069	58	068	57
	10	078	16	077	25	076	32	075	36	074	39	073	38
	14	083	01	082	11	081	18	080	24	079	28	078	28
	18	087	52	087	04	086	12	085	20	084	25	083	26
	22	092	47	092	01	091	11	090	20	089	27	088	31
	26	097	47	097	02	096	15	095	26	094	35	093	42
	30	102	51	102	08	101	23	100	37	099	48	098	58

N

S.	D.	42		43		44		45		46		47	
♌	0	102	51	102	08	101	23	100	37	99	48	098	58
	4	107	57	107	16	106	34	105	50	105	04	104	17
	8	113	05	112	27	111	47	111	06	110	23	109	38
	12	118	15	117	39	117	02	116	23	115	44	115	02
	16	123	25	122	53	122	19	121	42	121	16	120	28
	20	128	36	128	06	127	35	127	02	126	29	125	54
	24	133	48	133	21	132	52	132	25	131	52	131	20
	28	138	58	138	34	138	08	137	43	137	15	136	47
♍	2	144	08	143	47	143	24	143	02	142	38	142	30
	6	149	18	148	59	148	40	148	20	148	00	147	39
	10	154	26	154	10	153	55	153	38	153	21	153	04
	14	159	34	159	22	159	09	158	56	158	42	158	28
	18	164	41	164	31	164	22	164	12	164	02	163	52
	22	169	48	169	41	169	35	169	28	169	22	169	15
	26	174	54	174	51	174	48	174	44	174	41	174	38
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	185	06	185	09	185	12	185	16	185	19	185	22
	8	190	12	190	19	190	25	190	32	190	38	190	45
	12	195	19	195	29	195	38	195	48	195	58	196	08
	16	200	26	200	38	200	51	201	04	201	18	201	32
	20	205	34	205	50	206	05	206	22	206	39	206	56
	24	210	42	211	01	211	20	211	40	212	00	212	21
	28	215	52	216	13	216	36	216	58	217	22	217	47
♏	2	221	02	221	26	221	52	222	17	222	45	223	13
	6	226	12	226	39	227	08	227	37	228	08	228	40
	10	231	24	231	54	232	25	232	58	233	31	234	06
	14	236	35	237	07	237	41	238	18	238	54	239	32
	18	241	45	242	21	242	58	243	37	244	16	244	58
	22	246	55	247	33	248	13	248	54	249	37	250	22
	26	252	03	252	44	253	26	254	10	254	56	255	43
	30	257	09	257	52	258	37	259	23	260	12	261	02

S.	D.	42		43		44		45		46		47	
♌	0	257	09	257	52	258	37	259	23	260	12	261	02
	4	262	13	262	58	263	45	264	34	265	25	266	18
	8	267	13	267	59	268	49	269	40	270	33	271	29
	12	272	08	272	56	273	48	274	40	275	35	276	34
	16	276	59	277	49	278	42	279	36	280	32	281	32
	20	281	44	282	35	283	28	284	24	285	21	286	22
	24	286	21	287	13	288	07	289	04	290	02	291	03
	28	290	51	291	43	292	39	293	34	294	33	295	35
♍	2	295	12	296	05	296	59	297	56	298	56	299	57
	6	299	26	300	17	301	12	302	08	303	07	304	08
	10	303	30	304	21	305	14	306	10	307	07	308	08
	14	307	24	308	14	309	07	310	01	310	57	311	57
	18	311	09	311	58	312	49	313	42	314	36	315	35
	22	314	47	315	33	316	22	317	13	318	07	319	02
	26	318	14	318	58	319	46	320	35	321	26	322	19
♒	0	321	33	322	16	323	01	323	47	324	36	325	26
	4	324	44	325	25	326	07	326	50	327	37	328	24
	8	327	55	328	23	329	03	329	45	330	27	331	12
	12	330	42	331	16	331	54	332	32	333	13	333	55
	16	333	31	334	04	334	38	335	13	335	50	336	29
	20	336	14	336	44	337	15	337	48	339	21	338	56
	24	338	51	339	19	339	48	340	17	340	47	341	19
	28	341	23	341	48	342	14	342	40	343	07	343	35
♓	2	343	53	344	14	344	36	345	59	345	23	345	48
	6	346	18	346	36	346	55	347	16	347	36	347	57
	10	348	40	348	56	349	11	349	28	349	45	350	02
	14	351	00	351	12	351	24	351	37	351	51	352	05
	18	353	16	353	26	353	35	353	45	353	55	354	05
	22	355	32	355	38	355	44	355	51	355	58	356	05
	26	357	47	357	49	357	52	357	56	358	00	358	03
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	47.25		48		49		50		51		51,32	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	001	54	001	53	001	50	001	46	001	41	001	39
	8	003	52	003	48	003	40	003	32	003	24	003	19
	12	005	50	005	44	005	32	005	22	005	08	005	01
	16	007	48	007	40	007	25	007	09	006	52	006	43
	20	009	49	009	39	009	20	009	00	008	40	008	28
	24	011	53	011	41	011	18	010	55	010	30	010	16
	28	014	00	013	46	013	20	012	52	012	23	012	07
♉	2	016	10	015	56	015	25	014	53	014	20	014	01
	6	018	25	018	09	017	34	016	58	016	21	016	00
	10	020	44	020	21	019	49	019	09	018	28	018	05
	14	023	11	022	51	022	10	021	26	020	40	020	14
	18	025	44	025	23	024	28	023	49	023	01	022	33
	22	028	24	028	02	027	13	026	21	025	28	024	58
	26	031	13	030	46	029	53	028	59	028	01	027	30
♊	0	034	08	033	41	032	45	031	47	030	46	030	12
	4	037	14	036	45	035	47	034	46	033	42	033	06
	8	040	29	040	01	038	59	037	55	036	48	036	08
	12	043	54	043	24	042	22	041	14	040	05	039	26
	16	047	32	047	01	045	56	044	47	043	35	042	55
	20	051	23	050	24	049	42	048	32	047	19	046	36
	24	055	21	054	48	053	40	052	29	051	13	050	30
	28	059	30	058	58	057	50	056	38	055	22	054	39
♋	2	063	52	063	20	062	11	061	00	059	44	059	01
	6	068	25	067	52	066	44	065	33	064	18	063	35
	10	073	07	072	34	071	28	070	18	069	04	068	22
	14	077	58	077	26	076	20	075	12	073	59	073	19
	18	082	56	082	26	081	24	080	16	079	08	078	28
	22	088	03	087	34	086	32	085	21	084	21	083	43
	26	093	16	092	46	091	48	090	47	089	42	089	06
	30	098	32	098	05	097	09	096	11	095	10	094	36

S.	D.	47.28		48		49		50		51		51.32	
♌	0	098	32	098	05	097	09	096	11	095	10	094	36
	4	103	53	103	27	102	34	101	40	100	42	100	10
	8	109	16	108	52	108	03	107	12	106	18	105	48
	12	114	42	114	19	113	34	112	46	111	57	111	29
	16	120	09	119	48	119	07	118	23	117	37	117	11
	20	125	37	125	17	124	39	123	59	123	18	122	55
	24	131	05	130	49	130	13	129	37	129	01	128	40
	28	136	32	136	18	135	48	135	16	134	43	134	24
♍	2	142	01	141	47	141	21	140	53	140	24	140	08
	6	147	26	147	17	146	54	146	30	146	06	145	52
	10	152	55	152	45	152	26	152	06	151	46	151	34
	14	158	20	158	13	157	58	157	42	157	26	159	16
	18	163	45	163	41	163	29	163	17	163	05	162	58
	22	169	11	169	08	169	00	168	52	168	44	168	39
	26	174	36	174	34	174	31	174	27	174	22	174	20
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	185	24	185	26	185	29	185	33	185	38	185	40
	8	190	49	190	52	191	00	191	08	191	16	191	21
	12	196	15	196	19	196	31	196	43	196	55	197	02
	16	201	40	201	47	202	02	202	18	202	34	202	44
	20	207	05	207	15	207	34	207	54	208	14	208	26
	24	212	33	212	43	213	06	213	30	213	54	214	08
	28	217	59	218	13	218	39	219	07	219	36	219	52
♏	2	223	28	223	42	224	12	224	44	225	17	225	36
	6	228	19	229	11	229	47	230	23	230	59	231	20
	10	234	21	234	43	235	21	236	01	236	42	237	05
	14	239	51	240	12	240	53	241	37	241	23	242	49
	18	245	18	245	41	246	26	247	14	247	03	248	31
	22	250	44	251	08	251	57	253	48	253	42	254	12
	26	256	07	256	33	257	26	258	20	259	18	259	50
	30	261	28	261	55	262	51	263	49	264	50	265	24

S.	D.	47.28		48		49		50		51		51.32	
♐	0	261	28	261	55	262	51	263	49	264	50	265	24
	4	266	44	267	14	268	1	269	13	270	18	270	54
	8	272	17	272	26	273	28	274	33	275	39	276	17
	12	277	04	277	34	278	36	279	44	280	52	281	32
	16	282	02	282	34	283	40	284	48	286	01	286	41
	20	286	53	287	26	288	32	289	42	290	56	291	38
	24	291	35	292	08	293	16	294	27	295	42	296	25
	28	296	08	296	40	297	49	299	00	300	16	300	59
♑	2	300	30	301	02	302	10	303	32	304	38	305	21
	6	304	39	305	12	306	20	307	31	308	47	309	30
	10	308	39	309	12	310	18	311	28	312	42	313	24
	14	312	28	312	59	314	04	315	13	316	25	317	06
	18	316	06	316	36	317	38	318	46	319	55	320	34
	22	319	31	319	59	321	01	322	05	323	12	323	52
	26	322	46	323	15	324	13	325	14	326	18	326	54
♒	0	325	52	326	19	327	15	328	13	329	14	329	48
	4	328	47	329	14	330	07	331	01	331	59	332	30
	8	331	36	331	58	332	47	333	39	334	32	335	02
	12	334	16	334	37	335	22	336	11	336	59	337	27
	16	336	49	337	09	337	50	338	34	339	20	339	46
	20	339	15	339	33	340	11	340	51	341	32	341	55
	24	341	35	341	51	342	26	343	02	343	39	344	00
	28	343	50	344	04	344	35	345	07	345	40	345	59
♓	2	346	01	346	14	346	40	347	08	347	37	347	53
	6	348	08	348	19	348	42	349	05	349	30	349	44
	10	350	11	350	21	350	40	351	00	351	20	351	32
	14	352	12	352	20	352	35	352	51	353	08	353	17
	18	354	11	354	16	354	28	354	40	354	52	354	59
	22	356	07	356	12	356	20	356	28	356	36	356	41
	26	358	04	358	07	358	10	358	14	358	19	358	21
	30	360	00	360	00	360	00	360	00	360	00	360	00

S.	D.	52		53		54		55		56		57	
♈	0	000	00	000	00	000	00	000	00	000	00	000	00
	4	001	37	001	32	001	28	001	23	001	18	001	12
	8	003	15	003	06	002	57	002	47	002	37	002	26
	12	004	55	004	41	004	27	004	12	003	57	003	40
	16	006	35	006	17	005	58	005	39	005	17	004	56
	20	008	18	007	55	007	32	007	07	006	41	006	13
	24	010	04	009	36	009	08	008	38	008	06	007	33
	28	011	53	011	20	010	47	010	13	009	35	008	56
♉	2	013	45	013	08	012	20	011	50	011	07	010	22
	6	015	42	015	01	014	18	013	32	012	44	011	52
	10	017	45	016	59	016	11	015	20	014	26	013	29
	14	019	52	019	02	018	08	017	30	016	13	015	11
	18	022	08	021	13	020	15	019	14	018	09	017	00
	22	024	31	023	31	022	28	021	22	020	03	018	56
	26	027	02	025	58	024	50	023	39	022	20	021	01
♊	0	029	42	028	34	027	22	026	06	024	51	023	17
	4	032	34	031	22	030	06	028	44	027	19	025	45
	8	035	36	034	22	033	01	031	35	030	05	028	27
	12	038	51	037	32	036	08	034	41	033	03	031	21
	16	042	19	040	57	039	31	037	59	036	20	034	33
	20	045	59	044	36	043	07	041	33	039	51	038	00
	24	049	53	048	29	046	58	045	23	043	38	041	46
	28	054	02	052	35	051	05	049	28	047	44	045	51
♋	2	058	24	056	59	055	28	053	49	052	05	050	12
	6	062	58	061	33	060	03	058	27	056	43	054	50
	10	067	45	066	22	064	53	063	19	061	37	059	46
	14	072	44	071	22	069	56	068	24	066	44	064	57
	18	077	52	076	34	075	10	073	41	072	05	070	23
	22	083	10	081	55	080	35	079	08	077	37	075	59
	26	088	34	087	22	086	06	084	45	083	19	081	46
	30	094	06	092	58	091	46	090	38	089	08	087	41

S.	D	52		53		54		55		56		57	
♌	0	094	06	092	58	091	46	090	38	089	08	087	41
	4	099	42	098	38	097	31	096	20	095	04	093	42
	8	105	22	104	22	103	11	102	14	101	03	099	47
	12	111	04	110	05	109	11	108	10	107	05	105	56
	16	116	49	115	59	115	05	114	10	113	10	112	07
	20	122	35	121	49	121	01	120	10	119	16	118	19
	24	128	22	127	41	126	57	126	12	125	24	124	31
	28	134	08	133	31	132	53	132	13	131	30	130	45
♍	2	139	54	139	22	138	48	138	13	137	36	136	57
	6	145	40	145	12	144	43	144	13	143	42	143	08
	10	151	24	151	01	150	38	150	13	149	47	149	19
	14	157	08	156	50	156	31	156	11	155	51	155	29
	18	162	52	162	38	162	24	162	10	161	54	161	37
	22	168	35	168	26	168	16	168	07	167	57	167	45
	26	174	18	174	13	174	08	174	04	173	59	173	53
♎	0	180	00	180	00	180	00	180	00	180	00	180	00
	4	185	42	185	47	185	52	185	56	186	01	186	07
	8	191	25	191	34	191	44	191	53	192	03	192	15
	12	197	08	197	22	197	36	197	50	198	06	198	23
	16	202	52	203	10	203	29	203	49	204	09	204	31
	20	208	36	208	59	209	22	209	47	210	13	210	41
	24	214	20	214	48	215	17	215	47	216	18	216	52
	28	220	06	220	38	221	12	221	47	222	14	223	03
♏	2	225	52	226	29	227	07	227	47	228	30	229	15
	6	231	38	232	19	233	33	233	48	234	36	235	29
	10	237	25	238	11	238	59	239	50	240	44	241	41
	14	243	11	244	01	244	55	245	50	246	50	247	53
	18	248	56	249	51	250	49	251	50	252	55	254	04
	22	254	38	255	38	256	41	257	47	258	57	260	13
	26	260	18	261	22	262	29	263	40	264	56	266	18
	30	265	54	267	02	268	14	269	30	270	52	272	19

S.	D.	52		53		54		55		56		57	
	0	265	54	267	02	268	14	269	30	270	52	272	19
	4	271	26	272	38	273	54	275	15	276	41	278	14
	8	276	50	278	05	279	25	280	52	282	23	284	01
	12	282	08	283	26	284	50	286	19	287	55	289	37
	16	287	16	288	38	290	04	291	36	293	16	295	03
	20	292	15	293	38	295	07	296	41	298	22	300	14
	24	297	02	298	27	299	57	301	33	303	17	305	10
	28	301	36	303	01	304	32	306	11	307	55	309	48
♑	2	307	58	307	25	308	55	310	32	312	16	314	09
	6	310	07	311	34	313	02	314	37	316	21	318	14
	10	314	01	315	24	316	53	318	27	320	09	322	00
	14	317	41	319	03	320	29	322	01	323	40	325	27
	18	321	09	322	28	323	52	325	19	326	57	328	39
	22	324	24	325	38	326	59	328	25	329	55	331	33
	26	327	26	328	38	329	54	331	16	332	42	334	15
♒	0	330	18	331	26	332	38	333	54	335	16	336	43
	4	332	58	334	02	335	10	336	21	337	51	338	59
	8	335	29	336	29	337	32	338	38	339	48	341	04
	12	337	52	338	47	339	45	340	46	341	38	343	00
	16	340	08	340	58	341	52	342	47	343	47	344	49
	20	342	15	343	01	343	49	344	40	345	34	346	31
	24	344	18	344	59	345	42	346	28	347	16	348	08
	28	346	15	346	52	347	30	348	10	348	53	349	38
♓	2	348	07	348	40	349	13	349	47	350	25	351	04
	6	349	56	350	24	350	52	351	22	351	54	352	27
	10	351	42	352	05	352	28	352	53	353	19	353	47
	14	353	25	353	43	354	02	354	21	354	43	355	04
	18	355	05	355	19	355	33	355	48	356	03	356	20
	22	356	45	356	54	357	03	357	13	357	23	357	34
	26	358	23	358	28	358	32	358	37	358	42	358	48
	30	360	00	360	00	360	00	360	00	360	00	360	00

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North declination under the earth, and South above it.

Pole	1		2		3		4		5		6		7	
0	0	47	1	35	2	23	3	10	3	59	4	48	5	37
1	0	46	1	33	2	20	3	06	3	54	4	42	5	30
2	0	45	1	31	2	17	3	03	3	49	4	35	5	22
3	0	44	1	29	2	13	2	47	3	43	4	29	5	15
4	0	43	1	27	2	10	2	53	3	38	4	23	5	07
5	0	42	1	25	2	07	2	49	3	33	4	16	5	00
6	0	41	1	23	2	04	2	45	3	27	4	10	4	53
7	0	40	1	21	2	01	2	40	3	22	4	04	4	45
8	0	39	1	18	1	58	2	36	3	17	3	57	4	38
9	0	38	1	16	1	54	2	32	3	11	3	51	4	30
10	0	36	1	14	1	51	2	28	3	06	3	44	4	23
11	0	35	1	12	1	48	2	23	3	01	3	38	4	15
12	0	34	1	10	1	45	2	19	2	55	3	31	4	07
13	0	33	1	07	1	41	2	14	2	50	3	25	4	00
14	0	32	1	05	1	38	2	10	2	44	3	18	3	52
15	0	31	1	03	1	35	2	06	2	38	3	11	3	44
16	0	30	1	01	1	31	2	01	2	33	3	04	3	36
17	0	29	0	58	1	28	1	56	2	27	2	58	3	28
18	0	28	0	56	1	24	1	52	2	21	2	51	3	20
19	0	26	0	54	1	21	1	47	2	15	2	44	3	12
20	0	25	0	51	1	17	1	43	2	10	2	36	3	03
21	0	24	0	49	1	14	1	38	2	04	2	29	2	55
22	0	23	0	46	1	10	1	33	1	57	2	22	2	46
23	0	22	0	44	1	06	1	28	1	51	2	15	2	38
24	0	20	0	42	1	03	1	23	1	45	2	07	2	29
25	0	19	0	39	0	59	1	18	1	39	1	59	2	20
26	0	18	0	36	0	55	1	13	1	32	1	52	2	11
27	0	16	0	34	0	51	1	07	1	26	1	44	2	02
28	0	15	0	31	0	47	1	02	1	19	1	36	1	52
29	0	14	0	28	0	43	0	57	1	12	1	28	1	43
30	0	12	0	26	0	39	0	51	1	05	1	19	1	33
31	0	11	0	23	0	35	0	46	0	58	1	11	1	23
32	0	10	0	20	0	30	0	40	0	51	1	02	1	13

Position.	1		2		3		4		5		6		7	
32	1	24	2	50	4	16	5	40	7	07	8	34	10	01
31	1	23	2	47	4	11	5	34	7	00	8	25	9	51
30	1	22	2	44	4	07	5	29	6	53	8	17	9	41
29	1	20	2	42	4	03	5	23	6	46	8	08	9	31
28	1	19	2	39	3	59	5	18	6	39	8	00	9	22
27	1	18	2	36	3	55	5	13	6	32	7	52	9	12
26	1	16	2	34	3	51	5	07	6	26	7	44	9	03
25	1	15	2	31	3	47	5	02	6	19	7	37	8	54
24	1	14	2	28	3	43	4	57	6	13	7	29	8	45
23	1	12	2	26	3	40	4	52	6	07	7	21	8	36
22	1	11	2	24	3	36	4	47	6	01	7	14	8	28
21	1	10	2	21	3	32	4	42	5	54	7	07	8	19
20	1	09	2	19	3	29	4	37	5	48	7	00	8	11
19	1	08	2	16	3	25	4	33	5	43	6	52	8	02
18	1	06	2	14	3	22	4	28	5	37	6	45	7	54
17	1	05	2	12	3	18	4	24	5	31	6	38	7	46
16	1	04	2	09	3	15	4	19	5	25	6	32	7	38
15	1	03	2	07	3	11	4	14	5	20	6	25	7	30
14	1	02	2	05	3	08	4	10	5	14	6	18	7	22
13	1	01	2	03	3	05	4	06	5	08	6	11	7	14
12	1	00	2	00	3	01	4	01	5	03	6	05	7	07
11	0	59	1	58	2	58	3	57	4	57	5	58	6	59
10	0	58	1	56	2	55	3	52	4	52	5	52	6	51
9	0	56	1	54	2	51	3	48	4	47	5	45	6	44
8	0	55	1	52	2	48	3	44	4	41	5	39	6	36
7	0	54	1	50	2	45	3	40	4	36	5	32	6	29
6	0	53	1	48	2	42	3	35	4	31	5	26	6	21
5	0	52	1	45	2	39	3	31	4	25	5	20	6	14
4	0	51	1	43	2	35	3	27	4	20	5	13	6	07
3	0	50	1	41	2	32	3	23	4	15	5	07	5	59
2	0	49	1	39	2	29	3	18	4	09	5	01	5	52
1	0	48	1	37	2	26	3	14	4	04	4	54	5	44
0	0	47	1	35	2	23	3	10	3	59	4	48	5	37

South Declination under the earth, and North above it.

North declination under the earth, and South above it.

Pole	8		9		10		11		12		13		14	
0	6	27	7	13	8	03	8	53	9	44	10	34	11	26
1	6	19	7	04	7	52	8	41	9	31	10	20	11	11
2	6	10	6	54	7	42	8	30	9	19	10	06	10	56
3	6	02	6	44	7	31	8	18	9	06	9	52	10	41
4	5	53	6	35	7	21	8	06	8	53	9	38	10	26
5	5	45	6	25	7	10	7	55	8	40	9	25	10	11
6	5	36	6	16	6	59	7	43	8	27	9	11	9	56
7	5	28	6	06	6	49	7	31	8	14	8	57	9	41
8	5	19	5	57	6	38	7	19	8	01	8	42	9	26
9	5	11	5	47	6	27	7	07	7	48	8	28	9	10
10	5	02	5	37	6	16	6	55	7	35	8	14	8	55
11	4	53	5	27	6	05	6	43	7	22	8	00	8	39
12	4	44	5	17	5	54	6	31	7	09	7	45	8	24
13	4	35	5	07	5	43	6	19	6	55	7	31	8	08
14	4	27	4	57	5	32	6	06	6	42	7	16	7	52
15	4	17	4	47	5	21	5	54	6	28	7	01	7	36
16	4	08	4	37	5	09	5	41	6	14	6	46	7	20
17	3	59	4	26	4	58	5	29	6	00	6	31	7	04
18	3	50	4	16	4	46	5	16	5	46	6	16	6	47
19	3	41	4	05	4	34	5	03	5	27	6	00	6	31
20	3	31	3	55	4	22	4	50	5	14	5	45	6	14
21	3	21	3	44	4	10	4	36	5	03	5	29	5	56
22	3	12	3	33	3	58	4	23	4	48	5	13	5	39
23	3	02	3	22	3	45	4	09	4	33	4	57	5	19
24	2	52	3	10	3	33	3	55	4	18	4	40	5	04
25	2	42	2	59	3	20	3	41	4	03	4	23	4	45
26	2	31	2	47	3	07	3	37	3	47	4	06	4	27
27	2	21	2	35	2	54	3	12	3	31	3	49	4	08
28	2	10	2	23	2	40	2	57	3	15	3	31	3	49
29	1	59	2	11	2	26	2	42	2	58	3	13	3	29
30	1	48	1	59	2	12	2	26	2	41	2	54	3	09
31	1	36	1	45	1	58	2	11	2	24	2	36	2	49
32	1	25	1	32	1	43	1	54	2	06	2	16	2	28

Position.	8		9		10		11		12		13		14	
0	11	29	12	54	14	23	15	52	17	22	18	52	20	24
1	11	18	12	41	14	08	15	35	17	04	18	32	20	03
2	11	06	12	28	13	54	15	20	16	47	18	14	19	43
3	10	55	12	15	13	40	15	04	16	30	17	55	19	23
4	10	44	12	03	13	26	14	49	16	13	17	37	19	03
5	10	33	11	51	13	12	14	34	15	57	17	19	18	44
6	10	24	11	39	12	59	14	19	15	41	17	02	18	25
7	10	12	11	27	12	46	14	05	15	25	16	45	18	07
8	10	02	11	16	12	33	13	51	15	10	16	28	17	48
9	09	52	11	04	12	21	13	37	14	55	16	11	17	33
10	09	42	10	53	12	08	13	23	14	40	15	55	17	13
11	09	33	10	42	11	56	13	10	14	25	15	39	16	56
12	09	23	10	31	11	44	12	56	14	10	15	23	16	38
13	09	13	10	21	11	32	12	43	14	01	15	08	16	21
14	09	04	10	10	11	20	12	30	13	42	14	52	16	05
15	08	55	10	00	11	08	12	17	13	28	14	37	15	48
16	08	46	09	49	10	57	12	05	13	14	14	22	15	32
17	08	37	09	39	10	45	11	52	13	00	14	07	15	16
18	08	27	09	29	10	34	11	40	12	46	13	52	15	00
19	08	19	09	19	10	23	11	27	12	34	13	37	14	44
20	08	10	09	09	10	12	11	15	12	19	13	23	14	28
21	08	01	08	59	10	01	11	03	12	06	13	08	14	13
22	07	52	08	49	09	50	10	51	11	53	12	54	13	57
23	07	43	08	39	09	39	10	39	11	40	12	40	13	42
24	07	35	08	29	09	28	10	27	11	27	12	26	13	26
25	07	26	08	20	09	17	10	15	11	14	12	11	13	11
26	07	18	08	10	09	07	10	03	11	01	11	57	12	56
27	07	09	08	01	08	56	09	51	10	48	11	43	12	41
28	07	01	07	51	08	45	09	40	10	35	11	30	12	26
29	06	52	07	42	08	35	09	28	10	22	11	16	12	11
30	06	44	07	32	08	24	09	16	10	09	11	02	11	56
31	06	35	07	22	08	14	09	05	09	57	10	48	11	41
32	06	27	07	13	08	03	08	53	09	44	10	34	11	26

South declination under the earth, and North above it.

Pole	15		16		17		18		19		20		21	
0	12	18	13	11	14	04	14	57	15	52	16	48	17	46
1	12	02	12	54	13	46	14	38	15	31	16	26	17	23
2	11	46	12	37	13	27	14	18	15	11	16	04	17	00
3	11	30	12	19	13	09	13	58	14	50	15	42	16	37
4	11	14	12	02	12	50	13	39	14	29	15	21	16	14
5	10	57	11	45	12	32	13	19	14	08	14	59	15	51
6	10	41	11	27	12	14	13	00	13	48	14	36	15	27
7	10	21	11	10	11	55	12	40	13	27	14	14	15	04
8	10	01	10	52	11	36	12	20	13	06	13	52	14	40
9	09	52	10	35	11	17	12	00	12	44	13	30	14	17
10	09	36	10	17	10	59	11	40	12	23	13	07	13	53
11	09	19	09	59	10	40	11	20	12	02	12	45	13	29
12	09	02	09	41	10	20	10	59	11	40	12	22	13	05
13	08	45	09	23	10	01	10	39	11	18	11	59	12	41
14	08	28	09	05	09	42	10	18	10	57	11	36	12	16
15	08	11	08	47	09	22	09	57	10	34	11	12	11	52
16	07	54	08	28	09	02	09	36	10	12	10	49	11	27
17	07	36	08	09	08	42	09	15	09	50	10	25	11	02
18	07	18	07	50	08	22	08	53	09	27	10	01	10	36
19	07	00	07	31	08	01	08	32	09	03	09	36	10	10
20	06	42	07	12	07	41	08	10	08	40	09	11	09	44
21	06	24	06	52	07	20	07	47	08	16	08	46	09	18
22	06	05	06	35	06	58	07	24	07	52	08	21	08	51
23	05	46	06	12	06	37	07	01	07	28	07	55	08	24
24	05	27	05	51	06	15	06	38	07	03	07	29	07	56
25	05	07	05	30	05	52	06	14	06	38	07	02	07	27
26	04	47	05	09	05	29	05	50	06	12	06	34	06	59
27	04	27	04	47	05	06	05	25	05	46	06	07	06	29
28	04	07	04	25	04	43	05	00	05	19	05	39	05	59
29	03	46	04	02	04	19	04	34	04	42	05	10	05	29
30	03	24	03	39	03	54	04	08	04	24	04	40	04	58
31	03	02	03	16	03	29	03	41	03	56	04	10	04	26
32	02	40	02	52	03	03	03	14	03	27	03	39	03	53

North declination under the earth, and South above it.

Position.	15		16		17		18		19		20		21	
32	21	56	23	30	25	05	26	40	28	17	29	57	31	39
31	21	34	23	06	24	39	26	13	27	48	29	26	31	06
30	21	12	22	43	24	14	25	46	27	20	28	56	30	34
29	20	50	22	20	23	49	25	20	27	02	28	26	30	03
28	20	29	21	57	23	25	24	54	26	25	27	55	29	33
27	20	09	21	35	23	02	24	29	25	58	27	29	29	03
26	19	49	21	13	22	39	24	04	25	32	27	02	28	33
25	19	29	20	52	22	16	23	40	25	06	26	34	28	05
24	19	09	20	31	21	53	23	16	24	41	26	07	27	46
23	18	50	20	10	21	31	22	53	24	16	25	41	27	08
22	18	31	19	47	21	10	22	30	23	52	25	15	26	41
21	18	12	19	30	20	48	22	07	23	28	24	50	26	14
20	17	54	19	10	20	27	21	44	23	04	24	25	25	48
19	17	36	18	51	20	07	21	22	22	41	24	00	25	24
18	17	18	18	32	19	46	21	01	22	17	23	35	24	56
17	17	00	18	13	19	26	20	39	21	54	23	11	24	30
16	16	42	17	54	19	06	20	18	21	32	22	47	24	05
15	16	25	17	35	18	46	19	57	21	10	22	24	23	40
14	16	08	17	17	18	26	19	36	20	47	22	00	23	16
13	15	51	16	59	18	07	19	15	20	26	21	37	22	51
12	15	34	16	41	17	48	18	55	20	04	21	14	22	27
11	15	17	16	23	17	28	18	34	19	42	20	51	22	03
10	15	00	16	05	17	09	18	14	19	21	20	29	21	39
9	14	44	15	47	16	51	17	54	19	00	20	06	21	15
8	14	27	15	30	16	32	17	34	18	38	19	44	20	52
7	14	15	15	12	16	13	17	14	18	17	19	22	20	28
6	13	55	14	55	15	54	16	54	17	56	19	00	20	05
5	13	39	14	37	15	36	16	35	17	36	18	37	19	41
4	13	22	14	20	15	18	16	15	17	15	18	15	19	18
3	13	06	14	03	14	59	15	56	16	54	17	54	18	55
2	12	50	13	45	14	41	15	36	16	33	17	32	18	32
1	12	34	13	28	14	22	15	16	16	13	17	10	18	09
0	12	18	13	11	14	04	14	57	15	52	16	48	17	

South declination under the earth, and North above it.

North declination under the earth, and South above it.

Pole	22		23		24		25		26		27		28	
0	18	44	19	44	20	43	21	45	22	56	23	43	25	00
1	18	20	19	19	20	16	21	17	22	27	23	12	24	28
2	17	55	18	53	19	50	20	49	21	57	22	42	23	56
3	17	31	18	27	19	23	20	21	21	28	22	11	23	24
4	17	07	18	02	18	56	19	53	20	59	21	40	22	52
5	16	42	17	36	18	29	19	25	20	29	21	10	22	20
6	16	18	17	11	18	02	18	56	20	00	20	39	21	48
7	15	53	16	45	17	35	18	28	19	30	20	08	21	15
8	15	29	16	19	17	08	18	00	19	00	19	37	20	43
9	15	04	15	53	16	40	17	31	18	30	19	05	20	10
10	14	39	15	26	16	13	17	02	18	00	18	34	19	37
11	14	14	15	00	15	45	16	33	17	30	18	02	19	04
12	13	48	14	33	15	17	16	04	16	59	17	30	18	31
13	13	23	14	06	14	49	15	34	16	28	16	58	17	57
14	12	57	13	39	14	21	15	04	15	57	16	25	17	23
15	12	31	13	12	13	52	14	34	15	25	15	52	16	49
16	12	05	12	45	13	23	14	04	14	53	15	19	16	14
17	11	38	12	17	12	54	13	33	14	21	14	45	15	39
18	11	11	11	48	12	24	13	02	13	49	14	11	15	03
19	10	44	11	20	11	54	12	31	13	16	13	37	14	27
20	10	17	10	51	11	24	11	59	12	42	13	02	13	51
21	09	49	10	21	10	53	11	26	12	09	12	36	13	14
22	09	20	09	51	10	21	10	53	11	33	11	50	12	36
23	08	51	09	21	09	49	10	20	10	59	11	14	11	57
24	08	22	08	50	09	17	09	46	10	23	10	36	11	18
25	07	52	08	19	08	44	09	11	09	47	09	58	10	39
26	07	22	07	47	08	10	08	36	09	10	09	20	09	58
27	06	51	07	15	07	36	08	00	08	33	08	40	09	17
28	06	20	06	41	07	01	07	24	07	54	08	00	08	35
29	05	48	06	07	06	26	06	49	07	15	07	19	07	54
30	05	15	05	33	05	49	06	08	06	35	06	37	07	01
31	04	41	04	57	05	12	05	29	05	54	05	53	06	22
32	04	07	04	21	04	34	04	49	05	11	05	09	05	39

Position	22		23		24		25		26		27		28	
32	33	21	34	57	36	52	38	41	40	41	42	17	44	24
31	32	47	34	31	36	14	38	01	39	18	41	33	43	38
30	32	13	33	55	35	37	37	22	39	17	40	49	42	53
29	31	40	33	21	35	00	36	44	38	37	40	07	42	08
28	31	08	32	47	34	25	36	06	37	58	39	26	41	25
27	30	37	32	13	33	50	35	30	37	19	38	46	40	43
26	30	06	31	41	33	16	34	54	36	42	38	06	40	02
25	29	36	31	09	32	42	34	19	36	05	37	28	39	21
24	29	06	30	38	32	09	33	44	35	29	36	50	38	42
23	28	37	30	07	31	37	33	10	34	53	36	12	38	03
22	28	08	29	37	31	05	32	37	34	18	35	36	37	24
21	27	39	29	07	30	33	32	04	33	43	35	00	36	46
20	27	11	28	37	30	02	31	31	33	10	34	24	36	09
19	26	44	28	08	29	32	30	59	32	36	33	49	35	33
18	26	17	27	40	29	02	30	28	32	03	33	15	34	57
17	25	48	27	11	28	32	29	57	31	31	32	41	34	21
16	25	23	26	43	28	03	29	26	30	59	32	07	33	46
15	24	57	26	16	27	34	28	56	30	27	31	34	33	11
14	24	31	25	49	27	05	28	26	29	55	31	01	32	37
13	24	05	25	22	26	37	27	56	29	24	30	28	32	03
12	23	40	24	55	26	09	27	26	28	53	29	56	31	29
11	23	14	24	28	25	41	26	57	28	22	29	24	30	56
10	22	49	24	02	25	13	26	28	27	52	28	52	30	23
9	22	24	23	35	24	46	25	59	27	22	28	21	29	50
8	21	59	23	09	24	18	25	30	26	52	27	49	29	17
7	21	35	22	43	23	51	25	02	26	22	27	18	28	45
6	21	10	22	17	23	24	24	34	25	52	26	47	28	12
5	20	46	21	52	22	57	24	05	25	23	26	16	27	40
4	20	21	21	26	22	30	23	37	24	53	25	46	27	08
3	19	57	21	01	22	03	23	09	24	24	25	15	26	36
2	19	33	20	35	21	46	22	41	23	55	24	44	26	04
1	19	08	20	09	21	10	22	13	23	25	24	14	25	32
0	18	44	19	44	20	43	21	45	22	56	23	43	25	00

Pole	29		30		31		32		33		34		35	
0	26	08	27	18	28	31	29	46	31	04	32	24	33	49
1	25	35	26	43	27	55	29	09	30	25	31	44	33	07
2	25	01	26	09	27	19	28	31	29	46	31	03	32	25
3	24	28	25	34	26	43	27	53	29	07	30	22	31	43
4	23	55	24	59	26	07	27	16	28	28	29	42	31	01
5	23	21	24	14	25	30	26	38	27	49	29	01	30	18
6	22	48	23	49	24	54	26	00	27	09	28	20	29	36
7	22	14	23	14	24	17	25	22	26	30	27	39	28	53
8	21	40	22	39	23	40	24	44	25	50	26	58	28	10
9	21	06	22	03	23	03	24	05	25	10	26	16	27	27
10	20	31	21	27	22	26	23	26	24	29	25	34	26	43
11	19	57	20	51	21	49	22	47	23	49	24	52	26	00
12	19	22	20	15	21	11	22	08	23	08	24	09	25	15
13	18	47	19	38	20	33	21	28	22	27	23	26	24	31
14	18	12	19	01	19	54	20	48	21	45	22	43	23	46
15	17	36	18	24	19	15	20	08	21	03	21	59	23	00
16	17	00	17	46	18	36	19	27	20	20	21	15	22	14
17	16	23	17	08	17	56	18	45	19	37	20	30	21	27
18	15	45	16	29	17	15	18	03	18	53	19	44	20	40
19	15	08	15	50	16	35	17	21	18	09	18	58	19	52
20	14	30	15	10	15	53	16	37	17	24	18	11	19	03
21	13	51	14	30	15	11	15	53	16	38	17	24	18	10
22	13	12	13	49	14	28	15	09	15	51	16	15	17	22
23	12	31	13	07	13	44	14	23	15	04	15	46	16	32
24	11	51	12	24	13	00	13	37	14	16	14	55	15	39
25	11	09	11	41	12	15	12	50	13	26	14	04	14	46
26	10	27	10	57	11	29	12	01	12	36	13	12	13	51
27	09	34	10	12	10	41	11	12	11	45	12	18	12	55
28	09	00	09	15	09	53	10	22	10	52	11	23	11	58
29	08	14	08	38	09	04	09	30	09	58	10	27	10	59
30	07	28	07	50	08	13	08	37	09	03	09	29	09	58
31	06	41	07	00	07	21	07	33	08	06	08	29	08	56
32	05	52	06	09	06	28	06	47	07	08	07	38	07	52

North declination under the earth, and South above it.

Position.	29		30		31		32		33		34		35	
32	46	24	48	27	50	34	52	45	55	00	57	10	59	46
31	45	35	47	36	49	41	51	49	54	02	56	19	58	42
30	44	48	46	46	48	49	50	55	53	05	55	19	57	40
29	44	02	45	58	47	58	50	02	52	10	54	41	56	39
28	43	16	45	11	47	09	49	10	51	16	53	25	55	40
27	42	32	44	24	46	21	48	20	50	23	52	30	54	43
26	41	49	43	39	45	33	47	31	49	32	51	36	53	47
25	41	07	42	55	44	47	46	42	48	42	50	44	52	52
24	40	25	42	12	44	02	45	55	47	52	49	53	51	59
23	39	45	41	29	43	18	45	09	47	04	49	02	51	06
22	39	04	40	47	42	34	44	23	46	16	48	13	50	16
21	38	25	40	06	41	51	43	39	45	30	47	24	49	28
20	37	46	39	26	41	09	42	55	44	44	46	37	48	35
19	37	08	38	46	40	27	42	11	43	59	45	50	47	46
18	36	31	38	07	39	47	41	29	43	15	45	04	46	58
17	35	53	37	28	39	06	40	47	42	31	44	18	46	11
16	35	16	36	50	38	26	40	05	41	48	43	33	45	24
15	34	40	36	12	37	47	39	24	41	05	42	49	44	38
14	34	04	35	35	37	08	38	44	40	23	42	05	43	52
13	33	29	34	58	36	29	38	04	39	41	41	22	43	07
12	32	54	34	21	35	51	37	24	39	00	40	39	42	23
11	32	19	33	45	35	13	36	45	38	19	39	56	41	38
10	31	45	33	09	34	36	36	06	37	39	39	14	40	55
9	31	10	32	33	33	56	35	27	36	58	38	32	40	11
8	30	36	31	57	33	22	34	48	36	18	37	40	39	28
7	30	02	31	22	32	55	34	10	35	38	37	09	38	45
6	29	28	30	47	32	08	33	32	34	59	36	28	38	02
5	28	55	30	12	31	32	32	54	34	19	35	47	37	20
4	28	21	29	37	30	55	32	16	33	40	35	06	36	37
3	27	48	29	02	30	19	31	39	33	01	34	26	35	55
2	27	15	28	27	29	43	31	01	32	22	33	45	35	13
1	26	41	27	53	29	07	30	23	31	43	33	04	34	31
0	26	08	27	18	28	31	29	46	31	04	32	24	33	49

South Declination under the earth, and North above it.

P 2

Pole	36		37		38		39		40		41		42	
0	35	16	36	47	38	23	40	04	41	49	43	42	45	41
1	34	32	36	02	37	36	39	15	40	59	42	50	44	47
2	33	49	35	06	36	49	38	27	40	08	41	58	43	53
3	33	05	34	31	36	02	37	38	39	18	41	05	42	59
4	32	21	33	46	35	15	36	49	38	27	40	13	42	03
5	31	37	33	00	34	28	36	00	37	36	39	20	41	10
6	30	53	32	14	33	40	35	12	36	45	38	27	40	15
7	30	09	31	28	32	53	34	22	35	54	37	34	39	20
8	29	24	30	42	32	05	33	32	35	03	36	41	38	25
9	28	40	29	56	31	17	32	42	34	11	35	47	37	29
10	27	54	29	09	30	28	31	51	33	19	34	53	36	33
11	27	09	28	22	29	39	31	01	32	26	33	58	35	36
12	26	23	27	34	28	49	30	09	31	33	33	03	34	39
13	25	40	26	46	27	59	29	18	30	39	32	07	33	41
14	24	50	25	57	27	09	28	25	29	44	31	11	32	43
15	24	02	25	08	26	18	27	22	28	49	30	14	31	43
16	23	04	24	18	25	26	26	38	27	54	29	16	30	43
17	22	26	23	28	24	34	25	44	26	57	28	17	29	42
18	21	37	22	37	23	41	24	49	26	00	27	18	28	40
19	20	47	21	45	22	47	23	53	25	01	26	17	27	37
20	19	56	20	52	21	52	22	56	24	02	25	15	26	33
21	19	04	19	58	20	56	21	57	23	02	24	12	25	28
22	18	11	19	03	19	59	20	58	22	00	23	08	24	21
23	17	18	18	08	19	01	19	58	20	47	22	03	23	13
24	16	24	17	11	18	02	18	56	19	43	20	56	22	03
25	15	28	16	13	17	01	17	53	18	47	19	47	20	51
26	14	31	15	13	15	59	16	48	17	39	18	37	19	38
27	13	32	14	02	14	55	15	42	16	30	17	25	18	23
28	12	23	13	10	13	50	14	34	15	19	16	11	17	05
29	11	31	12	06	12	43	13	24	14	06	14	54	15	45
30	10	28	11	00	11	34	12	12	12	50	13	35	12	22
31	09	23	09	52	10	23	10	57	11	32	12	13	12	56
32	08	16	08	42	09	10	09	10	10	18	10	48	11	27

South declination under the earth, and North above it.

Pofition.	36		37		38		39		40		41		42	
32	62	16	64	52	67	36	70	58	73	20	76	36	79	55
31	61	09	63	42	66	23	69	11	72	06	75	11	78	26
30	60	04	62	34	65	12	67	56	70	48	73	49	77	00
29	59	01	61	28	64	03	66	44	69	32	72	30	75	38
28	57	59	60	24	62	56	65	34	68	19	71	13	74	17
27	57	00	59	22	61	51	64	26	67	18	69	59	72	59
26	56	01	58	21	60	47	63	20	65	59	68	47	71	44
25	55	04	57	21	59	44	62	15	64	51	67	34	70	31
24	54	08	56	23	58	44	61	12	63	45	66	28	69	19
23	53	14	55	26	57	45	60	10	62	41	65	21	68	09
22	52	21	54	31	56	47	59	10	61	38	64	16	67	01
21	51	28	53	36	55	50	58	11	60	36	63	12	65	54
20	50	36	52	42	54	54	57	12	59	36	62	09	64	49
19	49	45	51	49	53	59	56	15	58	37	61	07	63	45
18	48	55	50	57	53	05	55	19	57	38	60	06	62	42
17	48	06	50	06	52	12	54	24	56	41	59	07	61	40
16	47	18	49	16	51	20	53	30	55	54	58	08	60	39
15	46	30	48	26	50	28	52	36	54	49	57	10	59	39
14	45	42	47	37	49	37	51	43	53	54	56	13	58	39
13	44	52	46	48	48	47	50	50	52	59	55	17	57	41
12	44	09	46	00	47	57	49	59	52	05	54	21	56	43
11	43	23	45	12	47	07	49	07	51	12	53	26	55	46
10	43	38	44	25	46	18	48	17	50	19	52	31	54	49
9	41	52	43	38	45	29	47	26	49	27	51	37	53	53
8	41	08	42	52	44	41	46	36	48	35	50	43	52	57
7	40	23	42	06	43	53	45	46	47	54	49	50	52	02
6	39	39	41	20	43	06	44	56	46	53	48	57	51	07
5	38	55	40	34	42	18	44	08	46	02	48	01	50	12
4	38	11	39	48	41	31	43	19	45	11	47	11	49	18
3	37	27	39	03	40	44	42	30	44	20	46	19	48	23
2	36	42	38	18	39	57	41	41	43	30	45	26	47	29
1	36	00	37	32	39	10	40	53	42	39	44	34	46	35
0	35	16	36	47	38	23	40	04	41	49	43	42	45	41

North declination under the earth, and South above it.

Pole	43		44		45		46		47		48		49	
0	47	48	50	07	52	36	55	19	58	24	61	56	66	03
1	46	52	49	09	51	36	54	17	57	20	60	49	64	54
2	45	56	48	11	50	36	53	15	56	15	59	43	63	45
3	45	00	47	13	49	36	52	12	55	11	58	36	62	36
4	44	04	46	15	48	35	51	10	54	06	57	29	61	26
5	43	07	45	16	47	35	50	07	53	01	56	21	60	16
6	42	11	44	17	46	34	49	04	51	56	55	14	59	06
7	41	14	43	18	45	33	48	01	50	50	54	06	57	56
8	40	16	42	19	44	31	46	57	49	44	52	57	56	49
9	39	18	41	19	43	29	45	53	48	37	51	41	55	33
10	38	20	40	19	42	27	44	48	47	30	50	38	54	21
11	37	21	39	18	41	23	43	32	46	22	49	28	53	08
12	36	22	38	16	40	20	42	36	45	13	48	17	51	54
13	35	22	37	14	39	15	41	29	44	04	47	05	50	39
14	34	21	36	11	38	10	40	29	42	54	45	15	49	23
15	33	20	35	07	37	04	39	12	41	42	44	37	48	06
16	32	17	34	02	35	46	38	03	40	30	43	22	46	47
17	31	14	32	57	34	48	36	52	39	16	42	05	45	27
18	30	10	31	50	33	38	35	39	38	01	40	47	44	06
19	29	04	30	42	32	27	34	26	36	44	39	27	42	43
20	27	58	29	32	31	15	33	11	35	26	38	05	41	18
21	26	48	28	11	30	02	31	54	34	06	36	42	39	51
22	25	40	27	09	28	46	30	35	33	44	35	16	38	21
23	24	29	25	55	27	29	29	14	31	19	33	48	36	49
24	23	16	24	39	26	10	27	52	29	53	32	18	35	59
25	22	01	23	21	24	48	26	27	28	24	30	44	33	37
26	20	45	22	01	23	25	24	59	26	52	29	08	31	55
27	19	26	20	38	21	58	23	28	25	17	27	28	30	10
28	18	04	19	13	20	29	21	54	23	18	25	44	28	20
29	16	40	17	45	18	56	20	17	21	56	23	56	26	26
30	15	03	16	14	17	20	18	36	19	09	22	03	24	26
31	13	50	14	39	15	40	16	50	18	17	20	04	22	19
32	12	10	13	00	13	56	15	00	16	20	17	59	20	26

Position	43		44		45		46		47		48		49	
32	83	26	87	14	91	16	95	38	100	28	106	53	112	00
31	82	46	85	35	89	32	93	48	98	31	103	48	109	47
30	80	23	84	00	87	52	92	02	96	39	101	49	107	40
29	78	56	82	29	86	16	90	21	94	52	99	56	105	40
28	77	32	81	01	84	43	88	44	93	10	98	08	103	46
27	76	10	80	36	83	14	87	10	91	31	96	24	101	56
26	74	51	78	13	81	47	85	39	89	56	94	44	100	11
25	73	35	76	53	80	24	84	11	88	24	93	08	98	29
24	72	20	75	35	79	02	82	46	86	55	91	34	96	07
23	71	07	74	13	77	43	81	24	85	29	90	04	95	17
22	69	56	73	05	76	26	80	03	84	04	89	36	93	45
21	68	47	71	53	75	10	78	44	82	42	87	10	92	15
20	67	38	70	42	73	57	77	27	81	22	85	47	90	48
19	66	32	69	32	72	45	76	12	80	04	84	25	89	22
18	65	26	68	24	71	34	74	59	78	47	83	05	88	00
17	64	22	67	17	70	24	73	46	77	32	81	47	86	39
16	63	19	66	12	69	16	72	35	76	18	80	30	85	19
15	62	16	65	07	68	08	71	26	75	06	79	15	84	00
14	61	15	64	03	67	02	70	17	73	54	78	01	82	43
13	60	14	63	00	65	57	69	09	72	44	76	47	81	27
12	59	14	61	58	64	52	68	02	71	35	75	35	80	12
11	58	15	60	56	63	49	66	06	70	26	74	24	78	58
10	57	16	59	55	62	45	65	50	69	18	73	14	77	45
9	56	18	58	55	61	43	64	45	68	11	72	04	76	33
8	55	20	57	55	60	41	63	41	67	04	70	55	75	21
7	54	22	56	56	59	39	62	37	65	58	69	46	74	10
6	53	25	55	57	58	38	61	34	64	52	68	38	73	00
5	52	29	54	58	57	37	60	31	63	47	67	30	71	50
4	51	32	53	59	56	37	59	28	62	42	66	23	70	40
3	50	36	53	01	55	36	58	26	61	37	65	16	69	30
2	49	40	52	03	54	36	57	25	60	32	64	09	68	21
1	48	44	51	05	53	36	56	21	59	28	63	03	67	12
0	47	48	50	07	52	36	55	19	58	24	61	56	66	03

South declination under the earth, and North above it.

Pole of	50	51	51.32	Position	50	51	51.32
0	71 14	78 58	90 00	32	119 20	129 20	141 52
1	70 02	77 36	88 05	31	116 58	126 44	139 08
2	68 51	76 22	87 29	30	114 43	124 19	136 37
3	67 39	75 07	86 13	29	112 35	122 00	134 14
4	66 27	73 53	85 58	28	110 33	119 52	132 00
5	65 24	72 38	83 41	27	108 37	117 50	129 53
6	64 02	71 23	82 24	26	106 56	115 52	123 52
7	62 49	70 07	81 07	25	105 00	114 00	125 56
8	61 36	68 50	79 49	24	103 17	112 10	124 05
9	60 21	67 33	78 30	23	101 37	110 27	122 17
10	59 06	66 15	77 11	22	100 01	108 46	120 34
11	57 50	64 57	75 51	21	98 28	107 08	118 53
12	56 34	63 37	74 29	20	96 56	105 33	117 16
13	55 16	62 16	73 07	19	95 28	104 00	115 41
14	53 57	60 54	71 43	18	94 01	102 29	114 08
15	52 35	59 31	70 18	17	92 36	101 01	112 38
16	51 15	58 06	68 51	16	91 13	99 34	111 09
17	49 52	56 39	67 22	15	89 53	98 09	109 42
18	48 27	54 11	65 52	14	88 31	96 46	108 17
19	47 00	53 40	64 19	13	87 12	95 24	106 53
20	45 32	52 07	62 44	12	85 54	94 03	105 31
21	44 00	50 32	61 07	11	84 38	92 43	104 09
22	42 27	48 54	59 26	10	83 22	91 25	103 49
23	40 51	47 13	57 43	9	82 07	90 07	101 30
24	39 11	45 29	55 55	8	80 55	88 50	100 11
25	37 28	43 40	54 04	7	79 39	87 33	98 53
26	35 42	41 48	52 08	6	78 26	86 17	97 36
27	33 51	39 50	50 07	5	77 04	85 02	96 19
28	31 55	37 48	48 00	4	76 01	83 47	95 02
29	29 53	35 38	45 46	3	74 49	82 33	93 47
30	27 45	33 21	43 23	2	73 37	81 18	92 31
31	25 30	30 56	40 52	1	72 26	80 00	91 55
32	23 06	28 20	38 08	0	71 14	78 50	90 00

North declination under the earth, and South above it.

South declination under the earth, and North above it.

A Table shewing the Elevation of the Pole upon the several Circles of Position of the 11, 12, 2, and 3d. houses, for 60 degrees of Latitude.

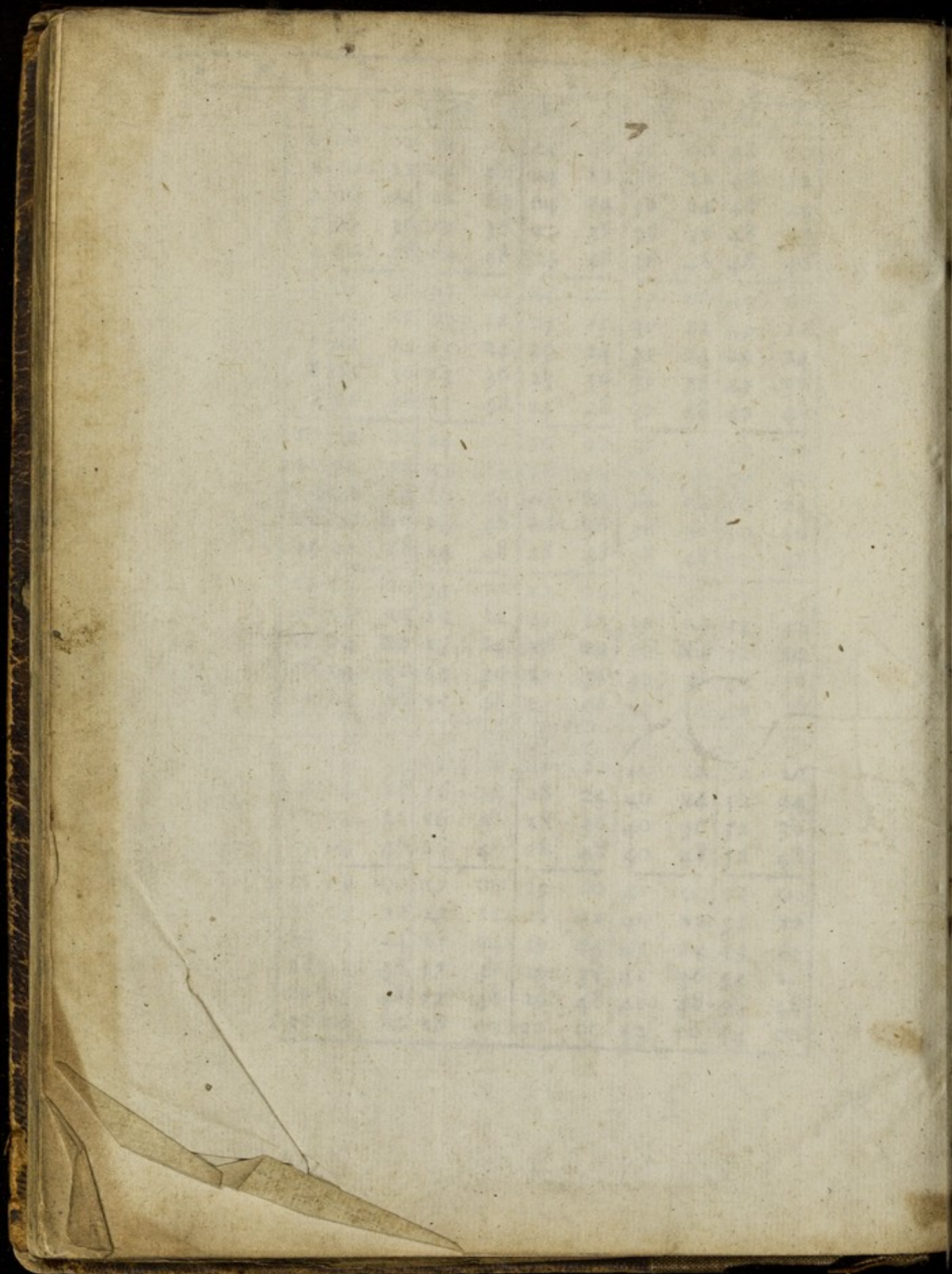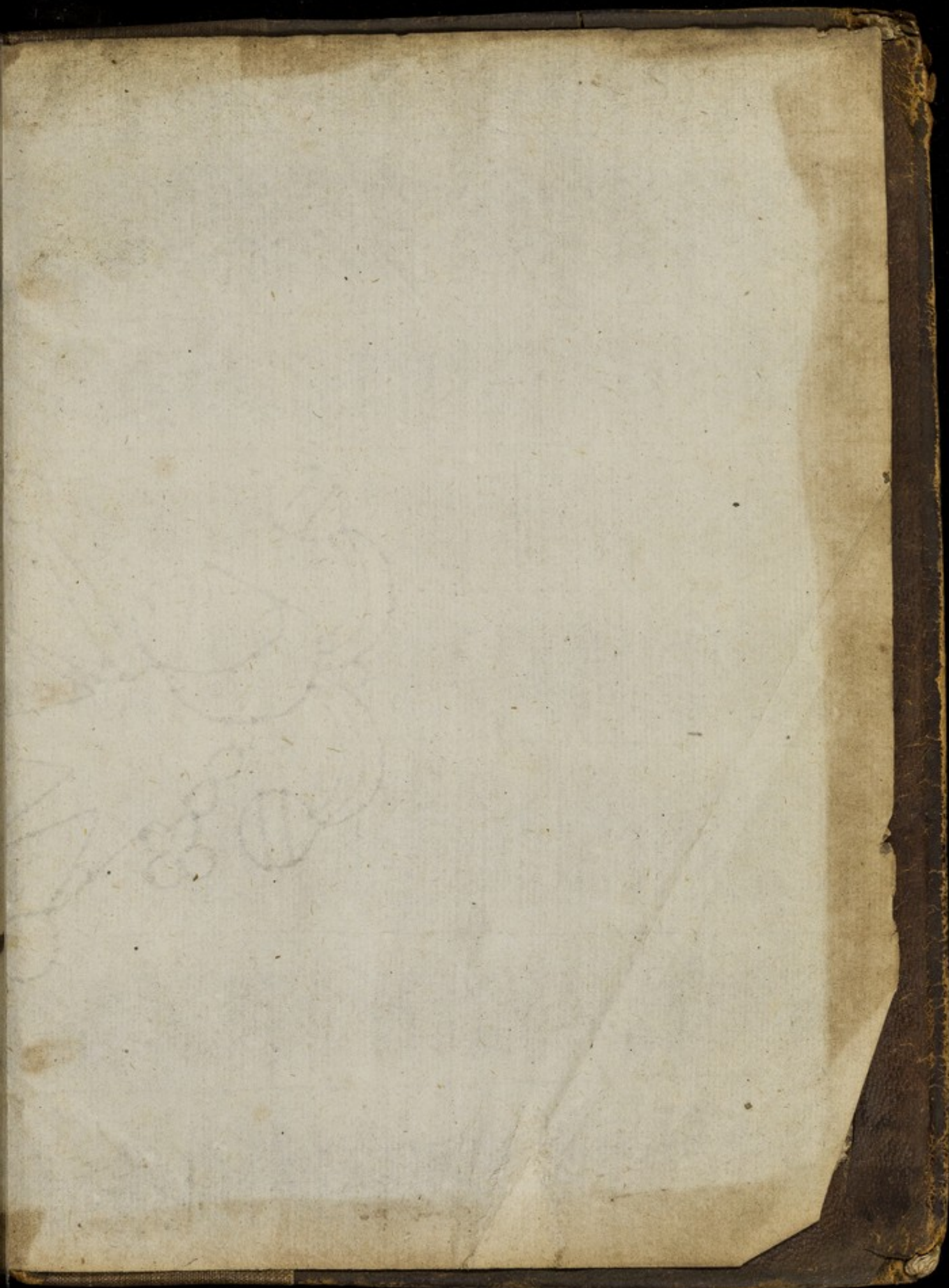| Latit. of Place.	11 & 3 (Poles Elevation)	12 & 2 (Poles Elevation)	Latit. of Place.	11 & 3 (Poles Elevation)	12 & 2 (Poles Elevation)
1	0 29	0 51	31	16 44	27 29
2	0 59	1 43	32	17 21	28 25
3	1 29	2 35	33	17 59	29 21
4	1 59	3 27	34	18 38	30 17
5	2 29	4 19	35	19 18	31 14
6	3 00	5 11	36	19 58	32 11
7	3 31	6 04	37	20 39	33 08
8	4 02	6 57	38	21 20	34 05
9	4 32	7 49	39	22 02	35 02
10	5 03	8 41	40	22 45	36 00
11	5 34	9 33	41	23 29	36 58
12	6 05	10 26	42	24 14	37 57
13	6 36	11 18	43	25 00	38 56
14	7 07	12 11	44	25 47	39 55
15	7 38	13 04	45	26 34	40 54
16	8 09	13 57	46	27 22	41 53
17	8 41	14 50	47	28 11	42 53
18	9 13	15 43	48	29 02	43 53
19	9 45	16 36	49	29 54	44 54
20	10 18	17 30	50	30 47	45 55
21	10 51	18 23	51	31 41	46 56
22	11 25	19 17	51.32	32 11	47 28
23	11 58	20 11	52	32 37	47 57
24	12 32	21 05	53	33 34	48 59
25	13 07	21 59	54	34 32	50 01
26	13 42	22 53	55	35 32	51 03
27	14 18	23 48	56	36 33	52 05
28	14 54	24 43	57	37 35	53 08
29	15 30	25 38	58	38 39	54 11
30	16 07	26 33	59	39 45	55 14
			60	40 53	56 18

FINIS.

Q

The second Table,

OR

A Table of Logarithmes, for the finding of the part proportional in all Sexagenary Tables, by help of the Supplemental Table in the first leaf thereof, serving as well for Time, as Motion.
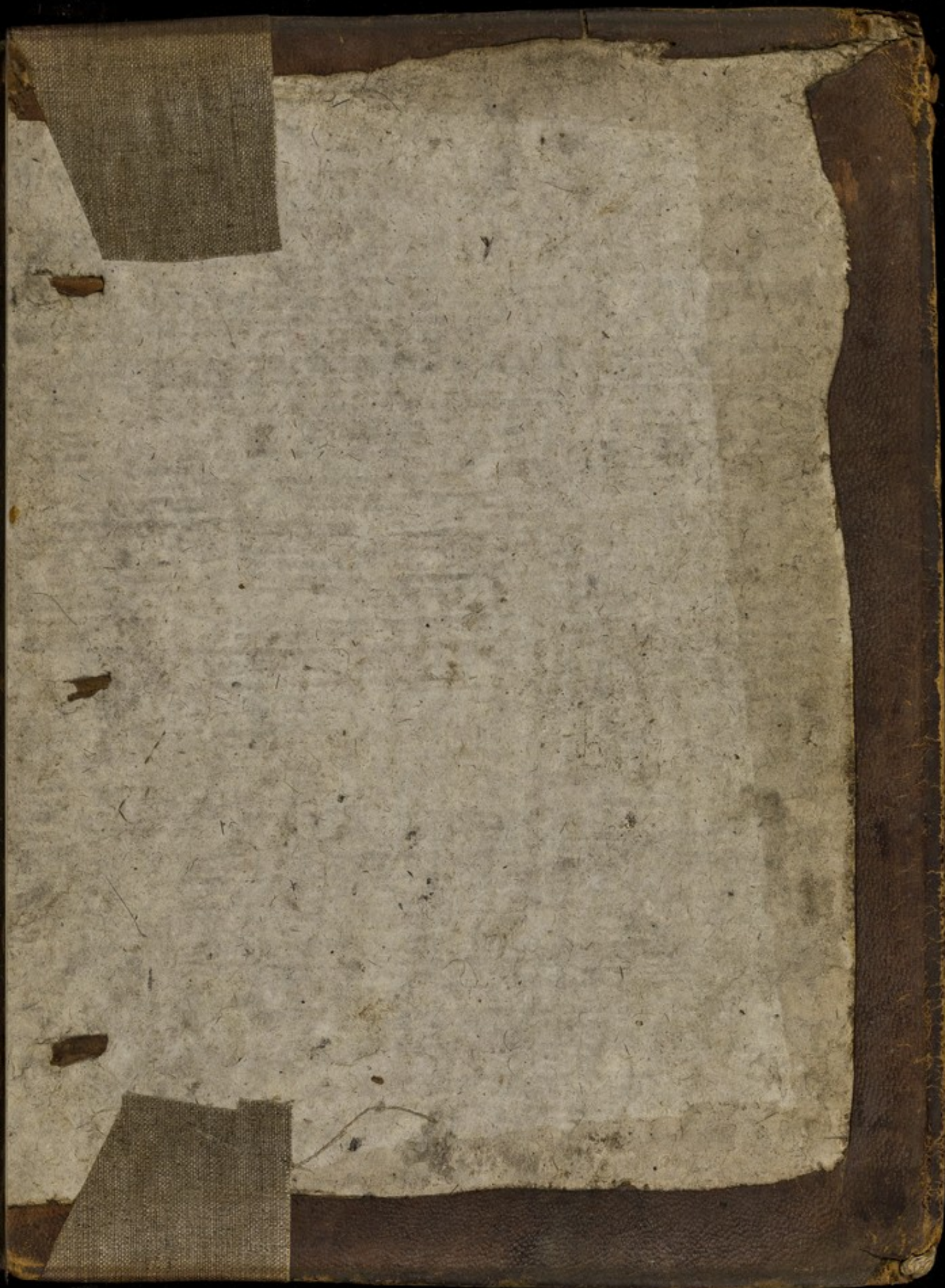
S.	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.
0	00	00	12	00	24	00	36	00	48	00
1	00	12	12	12	24	12	36	12	48	12
2	00	24	12	24	24	24	36	24	48	24
3	00	36	12	36	24	36	36	36	48	36
4	00	48	12	48	24	48	36	48	48	48
5	01	00	13	00	25	00	37	00	49	00
6	01	12	13	12	25	12	37	12	49	12
7	01	24	13	24	25	24	37	24	49	24
8	01	36	13	36	25	36	37	36	49	36
9	01	48	13	48	25	48	37	48	49	48
10	02	00	14	00	26	00	38	00	50	00
11	02	12	14	12	26	12	38	12	50	12
12	02	24	14	24	26	24	38	24	50	24
13	02	36	14	36	26	36	38	36	50	36
14	02	48	14	48	26	48	38	48	50	48
15	03	00	15	00	27	00	39	00	51	00
16	03	12	15	12	27	12	39	12	51	12
17	03	24	15	24	27	24	39	24	51	24
18	03	36	15	36	27	36	39	36	51	36
19	03	48	15	48	27	48	39	48	51	48
20	04	00	16	00	28	00	40	00	52	00
21	04	12	16	12	28	12	40	12	52	12
22	04	24	16	24	28	24	40	24	52	24
23	04	36	16	36	28	36	40	36	52	36
24	04	48	16	48	28	48	40	48	52	48
25	05	00	17	00	29	00	41	00	53	00
26	05	12	17	12	29	12	41	12	53	12
27	05	24	17	24	29	24	41	24	53	24
28	05	36	17	36	29	36	41	36	53	36
29	05	48	17	48	29	48	41	48	53	48
30	06	00	18	00	30	00	42	00	54	00

gw