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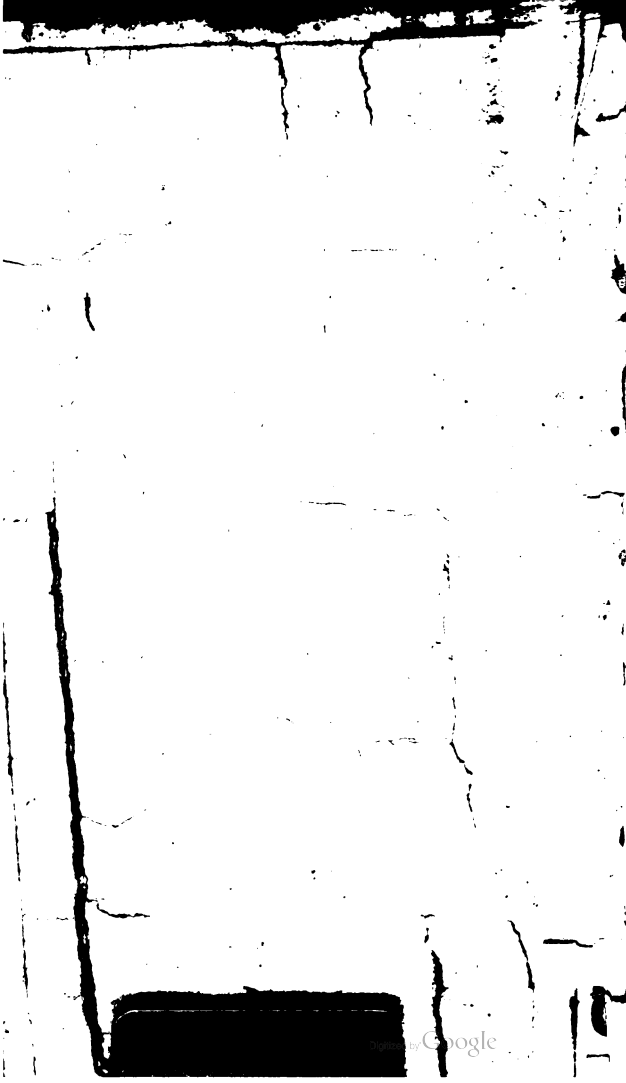
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33

Bayer. Staatsbibliothek

Math. P. 187.

Syrienberg

Mathesis. Tabulae Logarithm.

327.

ELEMENTA
TRIGONOMETRICA,
id est
SINVS TANGENTES
SECANTES
In Partibus Sinus totius
100000.

CHRISTOPHOR.
GRIENBERGERI
E Societate IESV.

Rerum Mathematicarum.
Opusculum Secundum.



ROMAE, Per Hæred. Barthol. Zan. 1630.

Superiorum permissu.

MVTIVS VITELLESQVS SOCIETATIS IESV

Præpositus Generalis.

Cum Opusculum, cui titulus est, Elementa
Trigonometrica P. Christophori Grien-
bergeri, nostræ Societatis; aliquot eiusdem
Societatis, quibus id commissum fuit recogno-
uerint; ac in lucem edi posse probauerint, facul-
tatem concedimus, ut typis mandetur, si ita ijs,
ad quos pertinet videbitur. In quorum fidē has
litteras manu nostra subscriptas, & sigillo nostro
munitas dedimus. Romæ xv. Nouemb. 1629.

Mutius Vitellescus.

*Imprimatur, si videbitur Reue-
rendiss. Patri Mag. Sacr. Pal.
Apostol.*

A. Episc. Bellocastr. Vicesg.

*Imprimatur, Fr. Raphael Viceca-
mes Lector & Socius Reueren-
diss. P. Fr. Nicolai Riccardij
Sacr. Pal. Apost. Mag. Ordinis
Prædic.*

Illustrissimo , & Excellentissimo

PRINCIPI

I A C O B O

Boncompagno

SORÆ DVCI.



Christophorus Grienbergerus

E Societate Iesu. S. P. D.



QVANQVAM SORA mihi
pervetus hospitium iam
inde fuit , cum primum
MAIORES TVI Societa-
tem fauore suo , sinuq. sunt humanissi-
mè complexi : tamen vt audacia , pæ-
nèq. dicam , licentia cresceret diu-
tendi , fecit EVCLIDES ille IYVOR ,
quem nuper memini , etsi vix tantem
adhuc , primaq. ELEMENTA ægrè
balbutientem , ibidem a TE sic acce-
ptum esse , vt senferit sibi non modo
domicilium in amplissimo palatio præ-

†

2

beri

beri; verum etiam sedem (quod sperare, nisi TE auctore nunquam auderet) in cordis tui meditullio destinari. Quæ tam comperta humanitas, si & hunc Euclidis Asseclam ad se illexit, utq. is itidem SORAM, velut hospitij iure diuerteret, inuitavit; vides per TE Princeps amplissime, cui debeat imputari. Ambiunt quippè, optatq. ELEMENTA hæc TRIGONOMETRIGA sedem eandem, quam apud TE litteris maioribus, Musisq. omnibus, iam ante vident patefactam. Neque verentur ex tamen nè impudentiæ insimulentur, si res tam exiles, tam illustre sibi diuersorium optent. Norunt enim TIBI me TVOQ. ILLVSTRISSIMO GENERI, ingentia debere, dare verò, nisi parua, idest, Elementa, non posse: eoq. fieri, ut Ego TIBI quoad innumeri hi NUMERI omnes percurrantur, viam moriarq. obgratus.

†

PROOE-

PROOEMIUM.



INTER omnes Sinuum Tabulas, tenere primas videntur Palatinae, quae Semidiametrum ponunt partium 10000000000. Sinusq. Tangentes, & secantes exhibent non solum pro omnibus minutis primis, sed etiam pro denis secundis. Sed quia Computistae communiter sunt contenti minutis primis, & sinu toto partium 100000. negari non potest Canonem manuum Bartholomaei Pitisci, vsui ordinariorum esse quam maximè accommodatum. Ego vnum tantum in ipso defectum reperio, quod Romae rariùs comparuerit, & tam cito, tamq. frequenter, è Bibliothecis euanuerit. Scio Bibliopolarum industria, hoc quidquid, est defectus facillè suppleri potuisse, si iam saepius in Germania recusum, Romae recudere voluissent: sed quia haecenus nemo fuit, qui hoc se beneficio Romanae Mathematicae obstringeret; necesse fuit, vt is saltem qui nuperrimè eidem studio Elementa Geometrica prouidit, provideret etiam Trigonometrica. Id quod me hoc secundo Opusculo praestitutum spero. In quo, quoad formam, & dispositionem à Pitisco non discedo; quia tamen ita fert occasio, aliquid addi posse puto: nimirum aliquot figuras ad Sinus, & Analogias Problematum Trigonometricorum, & alia quaedam vsui tabularum immediatius spectantia.

DISPOSITIO ita se habet. In fronte

†

3

om-

omnium paginarum legere est Titulos Sinuum, Tangentium, & Secantium.

Deinde in eadem fronte ad sinistram, supra primam columnam scribuntur numeri graduum à G. o. vsque ad 44. & reliqui gradus à 45. vsque ad 89. continuantur ordine retrogrado ad calcem: ita ut paginæ alternæ eisdem gradus numerent.

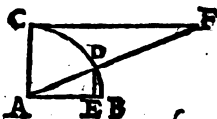
Tertiò. A gradibus fronris descendunt, & à gradibus calcis ascendunt minuta, à nullo minuto vsque ad 30. & à 30. vsque ad 60.

Quartò. E regione omnium minutorum progrediendo in transuersum, sub titulis Sinuum, Tangentium, atque Secantium, numerantur partes earundem linearum, in partibus Sinus totius 100000. Et Tangentes quidem, atque Secantes constant iisdem figuris, quibus apud Pitiscum, Sinus autem, numerant pro eodem Sinu toto 100000. illæ tantum figuræ, quæ sunt citra puncta, reliquæ verò adiectæ sunt ob sequentem causam.

*Cur hic, præter morem exponantur
Sinus vulgaribus maiores.*

Causa dabitur clariùs exemplo. In Tractatu Sinuum propositione 18. demonstrat Clavius, Sinum totum, hoc est, semidiameter circuli esse mediò loco proportionale, inter secantem cuiusq. arcus, vel anguli. & Sinum complementi eiusdem. Idq. manifestum est; in hac figura in qua arcus BD est complementum arcus,

CD,



CD, & recta DE est si-
 nus arcus BD, & AF se-
 cans arcus CD. Suntq
 triangula ABD, ACF,
 rectangula, & similia,
 quia anguli ad E, D, sunt recti, & per 29. pri-
 mi angulus ADB, est æqualis alterno CAF, &
 EAD, alterno AFC. unde per 4. sexti, ut DE
 sinus cõplementi arcus CD, ad AD, seu ad AC
 finum totum; ita est idem sinus totus ad AF,
 secantem eiusdem arcus CD. Et idcirco per 17.
 sexti rectangulum cõtentum sub DE, AF, æqua-
 le est quadrato Sinus totius AC; & consequen-
 ter, si hoc quadratum diuidatur per DE, quo-
 tiens diuisionis est necessario secans AF.
 Idq. proculdubio ita se haberet præcisè, si &
 numerus diuidendus, & Diuisor essent numeri
 veri. Ceterum licet Sinus totus partiũ 100000.
 sit verus, reliqui tamen sinus harum tabularum,
 si paucos excipias, non sunt penitus accurati:
 quamuis non differant à veris integra vnitare.
 Vnde sequitur quadratum sinus totius, idq. ve-
 rum diuisum, v. g. per sinum DE vnus mi-
 nuti non penitus verum, non posse dare secan-
 tem prorsus accuratam. Qui tamen defectus
 tolerabilis est, quando diuisor, & quotiens con-
 stât eodem numero figurarum. Quando autem
 diuisor constat paucioribus, quo fuerint paucio-
 res, eo erit quotientis error maior; ut manifestè
 apparet in hac diuisione quadrati sinus totius
 10000000000 per sinum vnus minuti 29. dua-
 rum figurarum, quarum posterior nempe 9. non
 est penitus accurata. Facta enim diuisione,
 inuenitur quotiens, hoc est, secans Grad. 89.

sin. 59. nimirū recta AF partiū 344827589
 multum diuersa ab ea, quæ ponitur in tabula
 partium 343774682. Nam præter duas figuras
 sinistras, reliquæ oēs sunt diuersæ. Jam vero cō-
 sideretur etiam hæc altera diuisio eiūdem qua-
 drati per sinum vnus minuti decem figurarum,
 licet in secante quæ quæritur, sint tantū nouem.
 Nā quo plures sunt figuræ diuisoris, & ac-
 curatiores, eo prodit quotiens accuratior. Sinus
 autem vnus minuti accuratior est 290882045
 respectu sinus totius 10000000000000. & di-
 uidēdo per hunc sinū vnus minuti quadratū si-
 nus totius 100000000000000000000000000000000
 inueniuntur saltem nouem figuræ pro secante
 quæsitæ, ita accuratè, vt nè vna quidem sit di-
 uersa ab ijs, quæ ponuntur in tabula; verobique
 enim inuenitur numerus 343774682.

Idem accidit in multiplicationibus, quando
 saltē alter multiplicantium non est verus. Tunc
 enim in summa non possunt esse plures figuræ
 veræ, quàm sunt in ipso multiplicante non ve-
 ro. Vt videre est in hoc exemplo. Si v. g. Si-
 nus vnus minuti 29. non verus, multiplicetur
 per sinum totum verum 100000. productus
 enim numerus est 2900000, in quo certum est
 secundam figuram 9. non esse præcisè veram,
 quāuis non differat vnitatē à vera. Si autem
 loco 29. assumeretur ad multiplicationē hic al-
 ter numerus 29. cum fractione $\frac{0882045}{1000000000}$
 quem suppeditat tabulæ accuratiores produ-
 ceretur summa $\frac{29088204560000}{1000000000}$ & fa-
 cta diuisione numeratoris per denominatorem
 inueniretur pro summa multiplicationis nu-
 merus 290882. multò accuratior, non enim

differt

differt à vera summa integra vnitatē .

Patet igitur non esse otiosos numeros sinibus ordinarijs adiectos , sed prodesse plurimū computationi sinceriori ; & nihil prorsus obesse vsui ordinario : eo quod ita adiecti sint ; vt suus locus vulgaribus sinibus relinquatur : cum figuræ ordinariæ ab additijs interiecto puncto optimè discernantur .

Sinus autem isti maiores transfuli in hunc locum ex mea tabula maiori quàm ad partes sinus totius 10000000000000000. ipsemet calculaui , vt minimum antè annos 35. iamque progressum feceram non contēendum in secantibus , quando comparuerunt tabulæ Palatinæ , quæ à me facillimè impetrauerunt vltèrius nè procederem : sed nunc vellem non impetrauissent : haberem enim vnde etiam Tangentibus , & Sécantibus succurrerem . Quamuis enim in Tabulis Palatinis non defint figuræ , quæ hic addi potuissent , quia tamen aliquas réperi dubias , nolui etiam dubitaretur de meis . Sed dabitur fortassis aliquando alias occasio præstandi id , quod modo præstare non possum . Equidem perutile foret omnes istos numeros habere in pluribus figuris , & omnes veris minores , ita vt adiectione vnus tantum vnitatis haberi possint etiam maiores . Per huiusmodi enim numeros minores , & maiores , possunt examinari multæ propositiones dubiæ , & saltem detegi ipsarum falsitas , quando non sunt veræ . Quales sunt omnes Quadraturæ , quæ hæcenus prodierunt in lucem , quæ ad sequentes numeros veluti ad lapidem Lydium adfricatæ manifestè produnt suam falsitatem . Quæ licèt non sint absolutè

veri; sunt tamen tam accurati, vt accuratiores
 nè circuli quidem cælestes desiderant, & fortas-
 sis Logistæ hactenus hisce maiores non conspe-
 xere. Quas antè prodidit Ludolphus à Colen
 sunt hisce minores quinque figuris, vt videre est
 ad propositionem 31. Cyclometrici Villebrordi
 Snellij, quo nemo alius quod sciã melius, atq. ad
 praxim dimensionis circuli accommodatius, nego-
 tium hoc pertractauit: cuius præceptionibus in-
 sistens, tentare cæpi, vtrum ex meis finibus ma-
 ioribus, & ex cõtinuis bisectionibus Arcus gra-
 duum 3. easdem circumferentias elicere pos-
 sem, quas Ludolphus; resq. succelsit penitus ex
 voto. Omnes enim 35. figuras reperi easdem,
 licq. omnem dubitandi occasionem sustuli, quæ
 circa huiusmodi calculos oriri solet. Certè
 quod ad me attinet certiores alios, accuratio-
 resq. iam amplius non desidero.

*Proportio Semidiametri, ad Semiperi-
 pheriam vera minorem, & maiorem.*

Est vt

100000. 00000. 00000. 00000. 00000.
 00000. 00000. 00000. Semidiameter vera.

Ad

314159. 26535. 89793. 23846. 26433.
 83279. 50288. 4199. Semiperipheriam ma-
 iorem vera, vel.
 314159. 26535. 89793. 23846. 26433.
 83279. 50288. 4196. Semiperipheriã mino-
 rem vera.

SEQVVN-



SEQUVNTVR
TABVLAE.



O	Sinus	Tangens	Secans
0	00.0000000	00	100000
1	29.08882045	29	100000
2	58.17765844	58	100000
3	87.26645152	87	100000
4	116.35525721	116	100000
5	145.44405305	145	100000
6	174.53283658	175	100000
7	203.62160535	204	100000
8	232.71035689	233	100000
9	261.79908874	262	100000
10	290.88779843	291	100000
11	319.97648351	320	100001
12	349.06514152	349	100001
13	378.15376999	378	100001
14	407.24236646	407	100001
15	436.33092847	436	100001
16	465.41945356	465	100001
17	494.50793927	495	100001
18	523.59638314	524	100001
19	552.68478270	553	100002
20	581.77313549	582	100002
21	610.86143906	611	100002
22	639.94969094	640	100002
23	669.03788867	669	100002
24	698.12602979	698	100002
25	727.21411184	727	100003
26	756.30213235	756	100003
27	785.39003887	785	100003
28	814.47797893	814	100003
29	843.56580007	844	100004
30	872.65354983	873	100024

	Sinus	Tangens	Secans
60	100000.00000	Infinita.	Infinita.
59	99999.99576	343774673	343774681
58	99999.98307	171887315	171887348
57	99999.96192	114591532	114591574
56	99999.93230	85943628	85943689
55	99999.89423	68754888	68754960
54	99999.84769	57295720	57295809
53	99999.79269	49110602	49110702
52	99999.72922	42971756	42971873
51	99999.65730	38197099	38197229
50	99999.57692	34377371	34377516
49	99999.48807	31252137	31252297
48	99999.39076	28647774	28647948
47	99999.28499	26444080	26444269
46	99999.17076	24555198	24555402
45	99999.04807	22918116	22918385
44	99998.91691	21485762	21485995
43	99998.77730	20221875	20222122
42	99998.62922	19098419	19098680
41	99998.47268	18093220	18093496
40	99998.30768	17188540	17188831
39	99998.13422	16370019	16370325
38	99997.95230	16370019	15626228
37	99997.76191	15625908	14946837
36	99997.56307	14946502	14324061
35	99997.35576	14323512	13751108
34	99997.13999	13221851	13222229
33	99996.91576	12732134	12732526
32	99996.68307	12277396	12277803
31	99996.44192	11854018	11854440
30	99996.19230	11458865	11459301

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O	Sinus	Tangens	Secans
30	8726.535498	873	100003
31	9017.412257	902	100004
32	9308.288253	931	100004
33	9599.163462	960	100005
34	9890.037858	989	100005
35	1018.0911418	1018	100005
36	1047.1784116	1047	100005
37	1076.2655928	1076	100006
38	1105.3526829	1105	100006
39	1134.4396795	1135	100006
40	1163.5265801	1164	100007
41	1192.6133822	1193	100007
42	1221.7000835	1222	100007
43	1250.7866813	1251	100008
44	1279.8731734	1280	100008
45	1308.9595571	1309	100009
46	1338.0458301	1338	100009
47	1367.1319898	1367	100009
48	1396.2180339	1396	100010
49	1425.3039598	1425	100010
50	1454.3897651	1455	100011
51	1483.4754474	1484	100011
52	1512.5610041	1513	100011
53	1541.6464328	1542	100012
54	1570.7317311	1571	100012
55	1599.8168965	1600	100013
56	1628.9019265	1629	100013
57	1657.9868187	1658	100014
58	1687.0715706	1687	100014
59	1716.1561798	1716	100015
60	1745.2406437	1745	100015

	Sinus	Tangens	Secans
30	99996.19230	11458865	1145931
29	99995.93423	11089205	1108961
28	99995.66769	10742648	1074311
27	99995.39269	10417094	1041755
26	99995.10923	10110690	1011118
25	99994.81731	9821794	982230
24	99994.51693	9548948	954947
23	99994.20809	9290849	929138
22	99993.89079	9046334	904688
21	99993.56502	8814357	881492
20	99993.23080	8593999	859456
19	99992.88811	8384351	838494
18	99992.53696	8184704	818531
17	99992.17735	7994349	7994961
16	99991.80928	7812634	7813272
15	99991.43275	7639001	7639651
14	99991.04776	7472917	7473524
13	99990.65431	7313899	7314583
12	99990.25240	7161507	7162205
11	99989.84202	7015335	7016047
10	99989.42319	6875009	6875736
9	99988.99589	6740185	6740927
8	99988.56014	6610547	6611304
7	99988.11592	6485801	6486572
6	99987.66324	6365674	6366460
5	99987.20211	6249914	6250715
4	99986.73251	6128290	6139105
3	99986.25445	6030582	6031411
2	99985.76793	5926587	5927431
1	99985.27294	5826117	5826975
0	99984.76951	5728996	5729869

I	Sinus	Tangens	Secans
0	1745.240643	1745	100015
1	1774.324959	1775	100016
2	1803.409126	1804	100016
3	1832.493439	1833	100017
4	1861.576998	1862	100017
5	1890.660699	1891	100018
6	1919.744239	1920	100018
7	1948.827618	1949	100019
8	1977.100832	1978	100020
9	2005.993878	2007	100020
10	2036.076711	2036	100021
11	2065.159458	2066	100021
12	2094.242088	2095	100022
13	2123.324340	2124	100023
14	2152.406513	2153	100023
15	2181.488503	2282	100024
16	2210.570309	2211	100024
17	2239.651928	2240	100025
18	2268.733357	2269	100026
19	2297.814594	2298	100026
20	2326.895637	2328	100027
21	2355.976483	2357	100028
22	2385.057129	2386	100028
23	2414.137574	2415	100029
24	2443.217815	2444	100030
25	2472.297849	2473	100031
26	2501.377673	2502	100031
27	2530.457286	2531	100032
28	2559.536685	2560	100033
29	2588.615867	2589	100034
30	2617.694830	2619	100034

	Sinus	Tangens	Secans
60	99984.76951	5728996	5729869
59	99984.25761	5635061	5635946
58	99983.73725	5544152	5545053
57	99983.20843	5456130	5457046
56	99982.67115	5370859	5371790
55	99982.12541	5288211	5289156
54	99981.57121	5208067	5209027
53	99981.00855	5130316	5131290
52	99980.43743	5054851	5055840
51	99979.85784	4981573	5982576
50	99979.26980	4910388	4911406
49	99978.67330	4841208	4842241
48	99978.06834	4773950	4774997
47	99977.45492	4708534	4709596
46	99976.83304	4644886	4645963
45	99976.20270	4582953	4584026
44	99975.56390	4522614	4523719
43	99974.91665	4463860	4464980
42	99974.26093	4406611	4407746
41	99973.59675	4350812	4351961
40	99972.92411	4296408	4297571
39	99972.24302	4243346	4244525
38	99971.55346	4191579	4192772
37	99970.85545	4141059	4142266
36	99970.14897	4091741	4092963
35	99969.43404	4043582	4044820
34	99968.71065	3995546	3997797
33	99967.97880	3950589	3951855
32	99967.23800	3905677	3906957
31	99966.4972	3861774	3863068
30	99965.73249	3818846	3820155

I	Sinus	Tangens	Secans
30	2617 694830	2619	100034
31	2646.773572	2648	100035
32	2675 852090	2677	100036
33	2704.930381	2706	100037
34	2734 008443	2735	100037
35	2763.086275	2764	100038
36	2792.163872	2793	100039
37	2821.241233	2822	100040
38	2850.318355	2851	100041
39	2879.395236	2881	100041
40	2908.471874	2910	100042
41	2937 548265	2939	100043
42	2966.624408	2968	100044
43	2995.700300	2997	100045
44	3024.775938	3026	100046
45	3053.851320	3055	100747
46	3082.926444	3084	100048
47	3112.001308	3113	100048
48	3141.075907	3143	100049
49	3170.150241	3172	100050
50	3199.224307	3201	100051
51	3228.298102	3230	100052
52	3257.371624	3259	100053
53	3286.444870	3288	100054
54	3315.517838	3317	100055
55	3344.590526	3346	100056
56	3373 662921	3376	100057
57	3402.735056	3405	100058
58	3431 806881	3434	100059
59	3460.878422	3463	100060
60	3489.949670	3491	100061

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	99965.73249	3818846	3820151
29	99964.96681	3776861	3778181
28	99964.19266	3735789	3737127
27	99963.41006	3695600	3696953
26	99962.61900	3656266	3657633
25	99961.81948	3617760	3619141
24	99961.01150	3580055	3581451
23	99960.19506	3543128	3544531
22	99959.37017	3506955	3508381
21	99958.53681	3471511	3472951
20	99957.69500	3436777	3438231
19	99956.84473	3402730	3404191
18	99955.98601	3369351	3370831
17	99955.11882	3336619	3338111
16	99954.24318	3304517	3306031
15	99953.35908	3273026	3274551
14	99952.46652	3242429	3243671
13	99951.56550	3211810	3213361
12	99950.65603	3182052	3183621
11	99949.73810	3152839	3154421
10	99948.81171	3124158	3125751
9	99947.87687	3095993	3097601
8	99946.93357	3068331	3069961
7	99945.98181	3041158	3042801
6	99945.02159	3014462	3016121
5	99944.05292	2988111	2989901
4	99943.07579	2962450	2964131
3	99942.09020	2937111	2938811
2	99941.09513	2912200	2913911
1	99940.09365	2887709	2889441
0	99939.08270	2863625	2865371

2	Sinus	Tangens	Secans
0	3489.949670	3492	100061
1	3519.020622	3521	100062
2	3548.091277	3550	100063
3	3577.161632	3579	100064
4	3606.231684	3609	100065
5	3635.301431	3638	100066
6	3664.370870	3667	100067
7	3693.439999	3696	100068
8	3722.508816	3725	100069
9	3751.577318	3754	100070
10	3780.645502	3783	100072
11	3809.713366	3812	100073
12	3838.780908	3842	100074
13	3867.848125	3871	100075
14	3896.915015	3900	100076
15	3925.981575	3929	100077
16	3955.047803	3958	100078
17	3984.113697	3987	100079
18	4013.179253	4016	100081
19	4042.244469	4046	100082
20	4071.309344	4075	100083
21	4100.373874	4104	100084
22	4129.438057	4133	100085
23	4158.501891	4162	100087
24	4187.565372	4191	100088
25	4216.628500	4220	100089
26	4245.691271	4250	100090
27	4274.753682	4279	100091
28	4303.815732	4308	100093
29	4332.877417	4337	100094
30	4361.938736	4366	100095

	Sinus	Tangens	Secans
60	99939.08270	2863625	2865371
59	99938.06328	2839940	2841700
58	99937.03541	2816642	2818417
57	99935.99909	2793723	2795512
56	99934.95431	2771174	2772978
55	99933.90107	2748985	2750804
54	99932.83937	2727149	2728981
53	99931.76922	2705656	2707503
52	99930.69062	2684498	2686360
51	99929.60355	2663669	2665545
50	99928.50804	2643160	2645051
49	99927.40406	2622964	2624869
48	99926.29164	2603074	2604994
47	99925.17075	2583482	2585417
46	99924.04141	2564183	2566132
45	99922.90362	2545170	2547134
44	99921.75737	2526436	2528414
43	99920.60267	2507976	2509969
42	99919.43951	2489783	2491790
41	99918.26789	2471851	2473873
40	99917.08782	2454176	2456212
39	99915.89930	2436751	2438802
38	99914.70232	2419571	2421637
37	99913.49689	2402632	2404712
36	99912.28300	2385928	2388022
35	99911.06066	2369451	2371563
34	99909.82987	2353205	2355329
33	99908.59062	2337178	2339316
32	99907.34352	2321367	2323512
31	99906.08676	2305768	2307935
30	99904.82215	2290377	2292559

2	Sinus	Tangens	Secans
30	4361.938736	4366	100095
31	4390.999686	4395	100097
32	4420.060264	4424	100098
33	4449.120468	4454	100099
34	4478.180296	4483	100100
35	4507.239745	4512	100102
36	4536.298812	4541	100103
37	4565.357496	4570	100104
38	4594.415793	4599	100106
39	4623.473702	4628	100107
40	4652.531219	4658	100108
41	4681.588343	4687	100110
42	4710.645070	4716	100111
43	4739.701339	4745	100113
44	4768.757327	4774	100115
45	4797.812852	4803	100116
46	4826.867970	4832	100117
47	4855.922680	4862	100118
48	4884.976979	4891	100120
49	4914.030865	4920	100121
50	4943.084335	4949	100122
51	4972.137386	4978	100124
52	5001.190017	5007	100125
53	5030.242225	5037	100127
54	5059.294007	5066	100128
55	5088.345361	5095	100130
56	5117.396285	5124	100131
57	5146.446775	5153	100133
58	5175.496830	5182	100134
59	5204.546447	5212	100136
60	5233.595624	5241	100137

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	99904.82215	2290377	2292559
29	99903.54909	2275189	2277336
28	99902.26757	2260201	2262413
27	99900.97760	2245410	2247635
26	99899.67918	2230810	2233050
25	99898.37230	2216390	2218653
24	99897.05697	2202171	2204440
23	99895.73319	2188125	2190409
22	99894.40099	2174257	2176555
21	99893.06027	2160563	2162876
20	99891.71113	2147040	2149368
19	99890.35354	2133685	2136027
18	99898.98749	2120495	2122851
17	99887.61299	2107466	2109838
16	99886.23004	2094597	2096982
15	99884.83864	2081883	2084283
14	99883.43879	2069322	2071737
13	99882.03049	2056911	2059341
12	99880.61373	2044649	2047093
11	99879.18852	2032531	2034989
10	99877.75486	2020555	2023028
9	99876.31275	2008720	2011207
8	99874.86219	1997022	1999524
7	99873.40318	1985459	1987976
6	99871.93571	1974029	1976560
5	99870.45980	1962730	1965275
4	99868.97543	1951558	1954119
3	99867.48262	1940513	1943088
2	99865.98135	1929592	1932182
1	99864.47164	1918793	1921397
0	99862.95347	1908114	1910732

	Sinus	Tangens	Secans
0	5233.595624	5241	100137
1	5262.644358	5270	100139
2	5291.692646	5299	100142
3	5320.740487	5328	100142
4	5349.787877	5357	100143
5	5378.834815	5387	100145
6	5407.881298	5416	100147
7	5436.927323	5445	100148
8	5465.972888	5474	100150
9	5495.017991	5503	100151
10	5524.062628	5533	100153
11	5553.106799	5562	100155
12	5582.150499	5591	100156
13	5611.193727	5620	100158
14	5640.236480	5649	100159
15	5669.278756	5678	100161
16	5698.320552	5708	100163
17	5727.361866	5737	100164
18	5756.402695	5766	100166
19	5785.443038	5795	100168
20	5814.482891	5824	100169
21	5843.522251	5854	100171
22	5872.561118	5883	100173
23	5901.599487	5912	100175
24	5930.637357	5941	100176
25	5959.674725	5970	100178
26	5988.711589	5999	100180
27	6017.747940	6029	100182
28	6046.783794	6058	100183
29	6075.819131	6087	100185
30	6104.853953	6116	100187

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	99862.95347	1908114	1910732
59	99861.42685	1897552	1900185
58	99859.89179	1887107	1889755
57	99858.34827	1876775	1879438
56	99856.79631	1866556	1869233
55	99855.23589	1856447	1859139
54	99853.66703	1846447	1849153
53	99852.08978	1836554	1839274
52	99850.50395	1826765	1829500
51	99848.90974	1817081	1819830
50	99847.30708	1807498	1810262
49	99845.69597	1798015	1800794
48	99844.07641	1788631	1791424
47	99842.44841	1779344	1782152
46	99840.81195	1770153	1772975
45	99839.16705	1761056	1763893
44	99837.51370	1752052	1754903
43	99835.85190	1743139	1746005
42	99834.18166	1734315	1737196
41	99832.50296	1725581	1728476
40	99830.81582	1716934	1719843
39	99829.12023	1708372	1711297
38	99827.41620	1699896	1702835
37	99825.70372	1691503	1694456
36	99823.98279	1683191	1686159
35	99822.25341	1674961	1677944
34	99820.51559	1666911	1669808
33	99818.76932	1658740	1661751
32	99817.01461	1650746	1653772
31	99815.25144	1642828	1645869
30	99813.47984	1634986	1638041
8611		A	

37	Sinus	Tangens	Secans
30	6104.853953	6116	100187
31	6133.888259	6145	100189
32	6162.922045	6175	100190
33	6191.955310	6204	100192
34	6220.988052	6233	100194
35	6250.020266	6226	100196
36	6279.051952	6291	100198
37	6308.083107	6321	100200
38	6337.113728	6350	100201
39	6366.143813	6379	100203
40	6395.173359	6408	100205
41	6424.202364	6437	100207
42	6453.230825	6467	100209
43	6482.258740	6496	100211
44	6511.286107	6525	100213
45	6540.312923	6554	100215
46	6569.339185	6584	100216
47	6598.364891	6613	100218
48	6627.390040	6642	100220
49	6656.414627	6671	100222
50	6685.438651	6700	100224
51	6714.462109	6730	100226
52	6743.485000	6759	100228
53	6772.507319	6788	100230
54	6801.529066	6817	100232
55	6830.550237	6847	100234
56	6859.570830	6876	100236
57	6888.590843	6905	100238
58	6917.610273	6934	100240
59	6946.629117	6963	100242
60	6975.647374	6993	100244

	Sinus	Tangens	Secans
30	99813.47984	1634985	1638041
29	99811.69978	1627217	1630287
28	99809.91129	1619523	1622607
27	99808.11434	1611900	1614999
26	99806.30895	1604348	1607462
25	99804.49512	1596867	1599995
24	99802.67284	1589454	1592597
23	99800.84211	1582110	1585268
22	99799.00294	1574834	1578005
21	99797.15533	1567623	1570810
20	99795.29927	1560478	1563679
19	99793.43477	1553398	1556613
18	99791.56182	1546381	1549611
17	99789.68043	1539428	1542672
16	99787.79060	1532536	1535795
15	99785.89232	1525705	1528979
14	99783.98560	1518935	1522223
13	99782.07043	1512224	1515527
12	99780.14682	1505572	1508890
11	99778.21477	1498978	1502310
10	99776.27428	1492442	1495788
9	99774.32534	1485962	1489323
8	99772.36796	1479537	1482913
7	99770.40214	1473168	1476558
6	99768.42788	1466853	1470258
5	99766.44517	1460592	1464011
4	99764.45403	1454383	1457817
3	99762.45444	1448227	1451676
2	99760.44641	1442123	1445586
1	99758.42993	1436070	1439547
0	99756.40502	1430067	1433559
8611	A 2		

4	Sinus	Tangens	Secans
0	6975.647374	6993	100244
1	7004.665040	7022	100246
2	7033.682114	7051	100248
3	7062.698593	7080	100250
4	7091.714474	7110	100252
5	7120.729754	7139	100254
6	7149.744433	7168	100257
7	7178.758506	7197	100259
8	7207.771972	7227	100261
9	7236.784828	7256	100263
10	7265.797072	7285	100265
11	7294.808701	7314	100267
12	7323.819712	7344	100269
13	7352.830104	7373	100271
14	7381.839874	7402	100274
15	7410.849019	7431	100276
16	7439.857537	7461	100278
17	7468.865426	7490	100280
18	7497.872682	7519	100282
19	7526.879304	7548	100284
20	7555.885285	7578	100287
21	7584.890635	7607	100287
22	7613.895339	7636	100289
23	7642.899399	7665	100291
24	7671.902812	7695	100293
25	7700.905576	4724	100298
26	7729.907688	7753	100300
27	7758.909147	7782	100302
28	7787.909948	7812	100305
29	7816.910091	7841	100307
30	7845.909572	7870	100309

	Sinus	Tangens	Secans
60	99756.40502	1430066	1433558
59	99754.37167	1424113	1427620
58	99752.32987	1418209	1421730
57	99750.27964	1412354	1415889
56	99748.22096	1406546	1410096
55	99746.15384	1400786	1404350
54	99744.07829	1395072	1398651
53	99741.99429	1389404	1392999
52	99739.90186	1383783	1387391
51	99737.80098	1378206	1381829
50	99735.69267	1372674	1376311
49	99733.57391	1367186	1370838
48	99731.44772	1361741	1365408
47	99729.31309	1356339	1360021
46	99727.17001	1350980	1354676
45	99725.01850	1345663	1349373
44	99722.85856	1340387	1344112
43	99720.69017	1335152	1338891
42	99718.51335	1329957	1333712
41	99716.32809	1324803	1328572
40	99714.13439	1319688	1323472
39	99711.93225	1314613	1318411
38	99709.72168	1309576	1313388
37	99707.50267	1304577	1308404
36	99705.27522	1299616	1303458
35	99703.03933	1294692	1298549
34	99700.79501	1289806	1293677
33	99698.54226	1284956	1288841
32	99696.28106	1280141	1284042
31	99694.01143	1275363	1279278
30	99691.73337	1270620	1274549
8511	A 3		

4	Sinus	Tangens	Secans
30	7845.909572	7870	100309
31	7874.908390	7899	100312
32	7903.906541	7929	100314
33	7932.904023	7958	100316
34	7961.900834	7987	100318
35	7990.896971	8017	100321
36	8019.892432	8046	100323
37	8048.887215	8075	100325
38	8077.881316	8104	100328
39	8106.874734	8134	100330
40	8135.867466	8163	100333
41	8164.859510	8192	100335
42	8193.850863	8221	100337
43	8222.841522	8251	100340
44	8251.831485	8280	100342
45	8280.820751	8309	100345
46	8309.809315	8339	100347
47	8338.797177	8368	100350
48	8367.784333	8397	100352
49	8396.770781	8427	100354
50	8425.756518	8456	100357
51	8454.741542	8485	100359
52	8483.725851	8514	100362
53	8512.709442	8544	100364
54	8541.692313	8573	100367
55	8570.674461	8602	100369
56	8599.655884	8632	100372
57	8628.636579	8661	100374
58	8657.616544	8690	100377
59	8686.595777	8720	101379
60	8715.574274	8749	100382

	Sinus	Tangens	Secans
30	99691.73337	1270620	1274545
29	99689.44687	1265912	1269850
28	99687.15193	1261239	1265195
27	99684.84856	1256600	1260572
26	99682.53676	1251994	1255981
25	99680.21652	1247422	1251422
24	99677.88784	1242883	1246900
23	99675.55073	1238377	1242408
22	99673.20519	1233903	1237941
21	99670.85121	1229461	1233521
20	99668.48880	1225051	1229125
19	99666.11795	1220672	1224761
18	99663.73868	1216324	1220427
17	99661.35097	1212006	1216125
16	99658.95482	1207719	1211852
15	99656.55024	1203462	1207610
14	99654.13724	1199235	1203397
13	99651.71579	1195037	1199214
12	99649.28592	1190868	1195059
11	99646.84761	1186728	1190934
10	99644.40088	1182617	1186837
9	99641.94571	1178533	1182768
8	99639.48211	1174478	1178727
7	99637.01008	1170450	1174714
6	99634.52961	1166450	1170728
5	99632.04072	1162476	1166769
4	99629.54340	1158529	1162837
3	99627.03764	1154609	1158932
2	99624.52346	1150715	1155052
1	99622.00085	1146847	1151199
0	99619.46980	1143005	1147371
851	A 4		

5	Sinus	Tangens	Secans
c	8715.574274	8748	100381
1	8744.552034	8778	100385
2	8773.529054	8807	100387
3	8802.505332	8837	100390
4	8831.480865	8866	100392
5	8860.455650	8895	100395
6	8889.429686	8925	100397
7	8918.402970	8954	100400
8	8947.375499	8983	100403
9	8976.347271	9013	100405
10	9005.318283	9042	100408
11	9034.288533	9071	100411
12	9063.258019	9101	100413
13	9092.226738	9130	100416
14	9121.194688	9159	100419
15	9150.161866	9189	100421
16	9179.128269	9218	100424
17	9208.093896	9247	100427
18	9237.058744	9277	100429
19	9266.022810	9306	100432
20	9294.986092	9335	100435
21	9323.948588	9365	100438
22	9352.910295	9394	100440
23	9381.871210	9423	100443
24	9410.831331	9453	100446
25	9439.790656	9482	100449
26	9468.749183	9511	100451
27	9497.706908	9541	100454
28	9526.663829	9570	100457
29	9555.619945	9600	100460
30	9584.575252	9629	100462

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	99619.46980	1143004	1147371
59	99616.93033	1139188	1143569
58	99614.38243	1135397	1139792
57	99611.82610	1131630	1136040
56	99609.26134	1127889	1132313
55	99606.68815	1124171	1128610
54	99604.10654	1120478	1124932
53	99601.51649	1116809	1121277
52	99598.91802	1113163	1117646
51	99596.31112	1109542	1114039
50	99593.69579	1105943	1110455
49	99591.07204	1102368	1106894
48	99588.43986	1098815	1103356
47	99585.79925	1095285	1099841
46	99583.15021	1091777	1096348
45	99580.49275	1088292	1092877
44	99577.82687	1084828	1089428
43	99575.15255	1081387	1086001
42	99572.46981	1077967	1082596
41	99569.77865	1074569	1079212
40	99567.07906	1071191	1075849
39	99564.37105	1067835	1072507
38	99561.65461	1064499	1069186
37	99558.92974	1061184	1065885
36	99556.19646	1057889	1062605
35	99553.45474	1054615	1059346
34	99550.70461	1051361	1056106
33	99547.94605	1048126	1052886
32	99045.17957	1044911	1049685
31	99542.40366	1041716	1046505
30	99539.61982	1038540	1043343
84	A 5		

5	Sinus	Tangens	Secans
30	9584.575252	9629	100462
31	9613.529747	9658	100465
32	9642.483430	9688	100468
33	9671.436296	9717	100471
34	9700.388344	9746	100474
35	9729.390571	9776	100477
36	9758.289975	9805	100480
37	9787.239554	9834	100482
38	9816.188304	9864	100485
39	9845.136223	9893	100488
40	9874.083310	9923	100491
41	9903.029561	9952	100494
42	9931.974974	9981	100497
43	9960.919546	10011	100500
44	9989.863276	10040	100503
45	10018.806161	10069	100506
46	10047.748197	10099	100509
47	10076.689384	10128	100512
48	10105.629718	10158	100515
49	10134.569197	10187	100518
50	10163.507818	10216	100521
51	10192.445579	10246	100524
52	10221.382478	10275	100526
53	10250.318512	10305	100530
54	10279.253678	10334	100533
55	10308.187975	10363	100536
56	10337.121400	10393	100539
57	10366.053949	10422	100542
58	10394.985622	10452	100545
59	10423.916415	10481	100548
60	10452.846326	10510	100551

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	99539.61983	1038540	1043343
29	99536.82758	1035383	1040201
28	99534.02691	1032245	1037077
27	99531.21781	1029125	1033973
26	99528.40029	1026025	1030887
25	99525.57435	1022943	1027819
24	99522.73999	1019879	1024770
23	99519.89721	1016833	1021739
22	99517.04601	1013805	1018725
21	99514.18638	1010795	1015730
20	99511.31834	1007803	1012752
19	99508.44188	1004828	1009792
18	99505.55699	1001871	1006849
17	99502.66369	998930	1003923
16	99499.76196	996001	1001015
15	99496.85182	99310	998123
14	99493.93326	990211	995248
13	99491.00628	987338	992389
12	99488.07088	984482	989547
11	99485.12706	981641	986722
10	99482.17482	978817	983912
9	99479.21417	976009	981119
8	99476.24510	973217	978341
7	99473.26761	970441	975579
6	99450.28171	967680	972833
5	99467.28738	964935	970103
4	99464.28465	962205	967387
3	99461.27349	959490	964687
2	99458.25392	956791	962002
1	99455.22593	954106	959332
0	99452.18953	651436	956677
84	A 6		

6 || Sinus | Tangens | Secans

0	10452.84632	10510	100550
1	10481.77535	10540	100554
2	10510.70349	10569	100557
3	10539.63074	10599	100560
4	10568.55710	10628	100563
5	10597.48256	10657	100566
6	10626.40713	10687	100569
7	10655.33080	10716	100573
8	10684.25356	10746	100576
9	10713.17543	10775	100579
10	10742.09638	10805	100582
11	10771.01643	10834	100585
12	10799.93557	10863	100588
13	10828.85379	10893	100592
14	10857.77109	10922	100595
15	10886.68748	10952	100598
16	10915.60295	10981	100601
17	10944.51749	11011	100604
18	10973.43110	11040	100608
19	11002.34379	11070	100611
20	11031.25555	11099	100614
21	11060.16637	11128	100617
22	11089.07626	11158	100621
23	11117.98521	11187	100624
24	11146.89322	11217	100626
25	11175.80028	11246	100630
26	11204.70640	11276	100634
27	11233.61157	11305	100637
28	11262.51579	11335	100640
29	11291.41906	11364	100644
30	11320.32137	11394	100647

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	99452.1.8953	951436	956677
59	994491.4471	948781	954537
58	994460.9148	946141	951411
57	994430.2984	943515	948300
56	994399.5977	940904	946203
55	994368.8130	938307	943620
54	994337.9441	935724	941052
53	994306.9910	933154	938497
52	994275.9539	930599	935957
51	994244.8326	928058	933430
50	994213.6272	925530	930917
49	994182.3376	923016	928417
48	994150.9639	920516	925931
47	994119.5061	918028	923459
46	994087.9642	915554	920999
45	994056.3382	913093	918553
44	994024.6280	910646	916120
43	993992.8338	908211	913699
42	993960.9554	905789	911299
41	993928.9929	903379	911292
40	993896.9464	900983	906515
39	993864.8157	898598	904146
38	993832.6009	896227	901788
37	993800.3021	893867	899444
36	993767.9191	871520	897111
35	993735.4521	889185	894791
34	993702.9009	886862	892482
33	993670.2657	884551	890186
32	993637.5464	882252	887901
31	993604.7431	879964	885628
30	993571.8556	877689	883367
83			

6	Sinus	Tangens	Secans
30	11320.32137	11394	100647
31	11349.22273	11423	100650
32	11378.12312	11452	100654
33	11407.02255	11482	100657
34	11435.92102	11511	100660
35	11464.81852	11541	100664
36	11493.71504	11570	100667
37	11522.61060	11600	100671
38	11551.510518	11629	100674
39	11580.39878	11659	100677
40	11609.29141	11688	100681
41	11638.18305	11718	100684
42	11667.07370	11747	100688
43	11695.96337	11777	100691
44	11724.85205	11806	100695
45	11753.73974	11836	100698
46	11782.62643	11865	100701
47	11811.51213	11895	100705
48	11840.39683	11924	100708
49	11869.28352	11954	100712
50	11898.16321	11983	100715
51	11927.04489	12013	100719
52	11955.92557	12042	100722
53	11984.80523	12072	100726
54	12013.68388	12101	100730
55	12042.56151	12131	100733
56	12071.43812	12160	100737
57	12100.31371	12190	100740
58	12129.18828	12219	100744
59	12158.06182	12249	100747
60	12186.93434	12278	100751

	Sinus	Tangens	Secans
30	99357.18556	877688	883367
29	99353.88841	875425	881118
28	99350.58285	873172	878880
27	99347.26889	870931	876653
26	99343.94652	868701	874438
25	99340.61574	866482	872234
24	99337.27656	864275	870041
23	99333.92897	862078	867859
22	99330.57297	859893	865688
21	99327.20857	857718	863528
20	99323.83577	855555	861379
19	99320.45456	853402	859241
18	99317.06495	851259	857113
17	99313.66693	849128	854996
16	99310.26091	847007	852889
15	99306.84569	844896	850793
14	99303.42246	842795	848707
13	99299.99084	840705	846632
12	99296.55081	838625	844566
11	99293.10237	836555	842511
10	99289.64554	834496	840466
9	99286.18030	832446	838431
8	99282.70666	830406	836405
7	99279.22463	828376	834390
6	99275.73419	826355	832384
5	99272.23535	824345	830388
4	99268.72811	822344	828402
3	99265.21247	820352	826425
2	99261.68843	818370	824457
1	99258.15600	816398	822500
0	99254.61516	814435	820551

7	Sinus	Tangens	Secans
0	12186 93434	12278	100751
1	12215.80582	12308	100755
2	12244.67626	12338	100758
3	12273.54568	12367	100762
4	12302.41405	12397	100765
5	12331.28138	12426	100769
6	12360.14767	12456	100773
7	12389.01291	12485	100776
8	12417.87711	12515	100780
9	12446.74025	12544	100784
10	12475.60234	12574	100787
11	12504.46337	12603	100791
12	12533.32335	12633	100795
13	12562.18227	12662	100799
14	12591.04012	12692	100802
15	12619.89691	12722	100806
16	12648.75263	12751	100809
17	12677.60728	12781	100813
18	12706.46086	12810	100817
19	12735.31336	12840	100821
20	12764.16478	12869	100825
21	12793.01513	12899	100828
22	12821.86439	12929	100832
23	12850.71256	12958	100836
24	12879.55965	12988	100840
25	12908.40565	13017	100844
26	12937.25056	13047	100848
27	12966.09437	13076	100851
28	12994.93709	13106	100855
29	13023.77870	13136	100859
30	13052.61922	13165	100862

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	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	992546.1516	814434	820550
59	992510.6592	812481	818612
58	992475.0829	810536	816681
57	992439.4226	808600	814760
56	992403.6783	806674	812849
55	992367.8501	804756	810946
54	992331.9378	802848	809052
53	992295.9416	800948	807167
52	992259.8615	799058	805291
51	992223.6974	797176	803423
50	992187.4493	795302	801564
49	992151.1172	793438	799714
48	992114.7013	791582	797873
47	992078.2013	789734	796040
46	992041.6175	787895	794216
45	992004.9496	786064	792399
44	991968.1979	784242	790591
43	991931.3622	782428	788792
42	991894.4425	780622	787001
41	991857.4390	778825	785218
40	991820.3515	777035	783443
39	991783.1801	775254	781677
38	991745.9247	773480	779918
37	991708.5855	771715	778167
36	991671.1623	769957	776424
35	991633.6553	768208	774689
34	991596.0643	766466	772961
33	991558.3894	764732	771242
32	991520.6306	763005	769530
31	991482.7875	761287	767826
30	991444.8613	759575	766130
82			

7	Sinus	Tangens	Secans
30	13052.61922	13165	100863
31	13081.45863	13195	100867
32	13110.29693	13224	100871
33	13139.13412	13254	100875
34	13167.97020	13284	100878
35	13196.80517	13313	100882
36	13225.63902	13343	100886
37	13254.47175	13372	100890
38	13283.30336	13402	100894
39	13312.13385	13432	100898
40	13340.96321	13461	100902
41	13369.79144	13491	100906
42	13398.61854	13521	100910
43	13427.44450	13550	100914
44	13456.26933	13560	100918
45	13485.09302	13609	100922
46	13513.91557	13639	100926
47	13542.73698	13669	100930
48	13571.55724	13698	100934
49	13600.37635	13728	100938
50	13629.19431	13758	100942
51	13658.01112	13787	100946
52	13686.82677	13817	100950
53	13715.64127	13846	100954
54	13744.45460	13876	100958
55	13773.26677	13906	100962
56	13802.07777	13935	100966
57	13830.88761	13965	100970
58	13859.69628	13995	100975
59	13888.50377	14024	100979
60	13917.31009	14054	100983

	Sinus	Tangens	Secans
30	99144.48613	759575	766120
29	99140.68508	757872	764441
28	99136.87565	756176	762759
27	99133.05782	754487	761085
26	99129.23161	752806	759418
25	99125.39701	751132	757759
24	99121.55402	749465	756107
23	99117.70264	747806	754462
22	99113.84288	746154	752825
21	99109.97473	744509	751194
20	99106.09820	742871	749571
19	99102.21327	741240	747955
18	99098.31997	739616	746345
17	99094.41817	737999	744743
16	99090.50820	736389	743143
15	99086.58973	734786	741560
14	99082.66289	733190	739978
13	99078.72766	731600	738403
12	99074.78404	730018	736835
11	99070.83200	728442	735274
10	99066.87166	726873	733719
9	99062.90290	725310	732171
8	99058.92576	723754	730630
7	99054.94023	722204	729095
6	99050.94632	720661	727566
5	99046.94403	719125	726044
4	99042.93336	717594	724529
3	99038.91431	716071	723019
2	99034.88687	714553	721517
1	99030.85106	713042	720020
0	99027.80687	711537	718520

8	Sinus	Tangens	Secans
0	13917.31009	14054	100982
1	13946.11523	14084	100987
2	13974.91919	14113	100991
3	14003.72197	14143	100995
4	14032.52357	14173	100999
5	14061.32397	14202	101004
6	14090.12319	14232	101008
7	14118.92121	14262	101012
8	14147.71804	14291	101016
9	14176.51368	14321	101020
10	14205.30811	14351	101024
11	14234.10134	14381	101029
12	14262.89337	14410	101033
13	14291.68419	14440	101037
14	14320.47380	14470	101041
15	14349.26219	14499	101046
16	14378.04938	14529	101050
17	14406.83535	14559	101054
18	14435.62010	14588	101059
19	14464.40362	14618	101063
20	14493.18593	14648	101067
21	14521.96700	14678	101071
22	14550.74685	14707	101076
23	14579.52547	14737	101080
24	14608.30285	14767	101084
25	14637.07900	14796	101089
26	14665.85391	14826	101093
27	14694.62757	14856	101097
28	14723.40000	14886	101102
29	14752.17118	14915	101106
30	14780.94111	14945	101111

	Sinus	Tangens	Secans
60	990268.0687	711537	718529
59	990227.5430	710038	717046
58	990186.9335	708547	715568
57	990146.2402	707059	714096
56	990105.4631	705579	712630
55	990064.6023	704105	709717
54	990023.6577	702637	709717
53	989982.6293	701174	708269
52	989941.5171	699718	708929
51	989900.3212	698268	705392
50	989859.0415	696823	703962
49	989817.6781	695385	702538
48	989776.2309	693952	701120
47	989734.6999	692524	699708
46	989693.0852	691103	798301
45	989651.3868	689688	696900
44	989609.6046	688271	695505
43	989567.7387	686874	694115
42	989525.7890	685475	662731
41	989483.7556	684082	691352
40	989441.6385	682694	689979
39	989399.4377	681312	688612
38	989357.1532	679936	687250
37	989314.7849	678564	685293
36	989272.3329	677199	684542
35	989229.7972	675838	683196
34	989187.1778	674483	681856
33	989144.4748	673133	680521
32	989101.6880	671789	679191
31	989058.8175	670450	677966
30	989015.8633	669116	676547
81			

8'	Sinus	Tangens	Secans
30	14780.94111	14945	101111
31	14809.70979	14975	101115
32	14838.47721	15005	101119
33	14867.24338	15034	101124
34	14896.00830	15064	101128
35	14924.77195	15094	101133
36	14953.53434	15124	101137
37	14982.29546	15153	101142
38	15011.05532	15183	101146
39	15039.81391	15213	101151
40	15068.57122	15243	101155
41	15097.32726	15272	101159
42	15126.08202	15302	101164
43	15154.83550	15332	101169
44	15183.58770	15362	701173
45	15212.33861	15391	101178
46	15241.08824	15421	101182
47	15269.83658	15451	101187
48	15298.58362	15481	101191
49	15327.32937	15511	101196
50	15356.07383	15540	101200
51	15384.81698	25570	101205
52	15413.55883	15600	101209
53	15442.29938	15630	101214
54	15471.03862	15660	101219
55	15499.77656	15689	101223
56	15528.51318	15719	101228
57	15557.24849	15749	121233
58	15585.98248	15779	101237
59	15614.71515	15809	101242
60	15643.44650	15838	101247

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	98901.58633	669116	676546
29	98897.28255	667787	675233
28	98892.97039	666463	673924
27	98888.64987	665144	672620
26	98884.32098	663831	671321
25	98879.98372	662523	670027
24	98875.63810	661219	668738
23	98871.28411	659921	667454
22	98866.92175	658627	666176
21	98862.55103	657339	664902
20	98858.17194	656055	663633
19	98853.78449	654777	662369
18	98849.38868	653503	661110
17	98844.98449	652234	659855
16	98840.57195	650970	658606
15	98836.15104	649710	657361
14	98831.72177	648456	656121
13	98827.28414	647206	654886
12	98822.83814	645961	653655
11	98818.38378	644720	652429
10	98813.92106	643484	651208
9	98809.44998	642253	649991
8	98804.97054	641026	648779
7	98800.48273	639804	647572
6	98795.98657	638587	646369
5	98791.48205	637374	645171
4	98786.96917	636165	643977
3	98782.44793	634961	642787
2	98777.91833	633761	641602
1	98773.38037	632566	640422
0	98768.83405	631375	639245
8111			

9	Sinus	Tangens	Secans
0	15643.44650	15838	101246
1	15672.17653	15868	101251
2	15700.90523	15898	101256
3	15729.63260	15928	101261
4	15758.35864	15958	101265
5	15787.08335	15988	101270
6	15815.80672	16017	101275
7	15844.52875	16047	101279
8	15873.24945	17077	101284
9	15901.96880	16107	101289
10	15930.68680	16137	101294
11	15959.40346	16167	101298
12	15988.11876	16196	101303
13	16016.83272	16226	101308
14	16045.54532	16256	101313
15	16074.25656	16286	101317
16	16102.96644	16316	101322
17	16131.67495	16346	101327
18	16160.38211	16376	101332
19	16189.08789	16405	101337
20	16217.79231	16435	101342
21	16246.49535	16465	101346
22	16275.19702	16495	101351
23	16303.89731	16525	101356
24	16332.59622	16555	101361
25	16361.29375	16585	101366
26	16389.98989	16615	101371
27	16418.68465	16645	101376
28	16447.37802	16674	101381
29	16476.07000	16704	101386
30	16504.76058	16734	101390

	Sinus	Tangens	Secans
60	98768.83405	631375	639245
59	98764.27938	630189	638073
58	98759.71635	629007	636906
57	98755.14497	627829	635743
56	68750.56522	626655	634584
55	98745.97712	625486	633429
54	98741.38067	624321	632279
53	98736.77586	623160	631133
52	98732.16270	622003	629991
51	98727.54118	620851	628853
50	98722.91131	619703	627719
49	98718.27308	618559	626590
48	98713.62650	617419	625464
47	98708.97157	616283	624343
46	98704.30829	615151	623226
45	98699.63665	614023	622113
44	98694.95666	612899	621004
43	98690.26833	611779	619898
42	98685.57164	610664	618797
41	98680.86660	609552	617700
40	98676.15321	608444	616607
39	98671.43147	607340	635517
38	98666.70138	606240	614432
37	98661.96294	605143	613350
36	98657.21616	604051	612273
35	98652.46102	602961	611199
34	98647.69754	601878	610129
33	98642.92571	600797	619062
32	98638.14554	599720	608000
31	98633.35702	598646	606941
30	98628.56015	597576	605886

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9	Sinus	Tangens	Secans
30	16504.76058	16734	101390
31	16533.44977	16764	101395
32	16562.13756	16794	101400
33	16590.82394	16824	101405
34	16619.50892	16854	101410
35	16648.19250	16884	101415
36	16676.87467	16914	101420
37	16705.55542	16944	101425
38	16734.23477	16974	101430
39	16762.91269	17004	101435
40	16791.58920	17033	101440
41	16820.26429	17063	101445
42	16848.93795	17093	101450
43	16877.61019	17123	101455
44	16906.28100	17153	101460
45	16934.95038	17183	101466
46	16963.61833	17213	101471
47	16992.28484	17243	101476
48	17020.94991	17273	101481
49	17049.61354	17303	101486
50	17078.27574	17333	101491
51	17106.93648	17363	101496
52	17135.59578	17393	101501
53	17164.25363	17423	101506
54	17192.91002	17453	101512
55	17221.56496	17483	101517
56	17250.21845	17513	101522
57	17278.87047	17543	101527
58	17307.52103	17573	101532
59	17336.17013	17603	101537
60	17364.81776	17633	101543

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	98628.56015	597576	605886
29	98623.75494	596510	604834
28	98618.94138	595448	603787
27	98614.11947	594390	602743
26	98609.28923	593335	601702
25	98604.45064	592283	600666
24	98599.60370	591235	599633
23	98594.74842	590191	598603
22	98589.88480	589151	597577
21	98585.01284	588114	596555
20	98580.13254	587080	595536
19	98575.24389	586050	594521
18	98570.34690	585024	593509
17	98565.44158	584001	592501
16	98560.52791	582982	591496
15	98555.60590	581966	590495
14	98550.67555	580953	589497
13	98545.73687	579944	588502
12	98540.78984	578938	587511
11	98535.83448	577936	586524
10	98530.87078	576937	585539
9	98525.89874	575941	584558
8	98520.91837	574949	583581
7	98515.92966	573960	582606
6	98510.93261	572974	581635
5	98505.92723	571992	580667
4	98500.91351	571013	579703
3	98495.89146	570037	578742
2	98490.86107	569064	577783
1	98485.82235	568094	576829
0	98480.77530	567128	575877
8011		B 2	

IO	Sinus	Tangens	Secans
0	17364.81776	17633	101542
1	17393.46392	17663	101548
2	17422.10861	17693	101553
3	17450.75183	17723	101558
4	17479.39357	17753	101564
5	17508.03383	17783	101569
6	18536.67260	17813	101574
7	17565.30990	17843	101579
8	17593.94571	17873	101585
9	17622.58003	17903	101589
10	17651.21285	17933	101595
11	17679.84419	17963	101601
12	17708.47403	17993	101606
13	17737.10237	18023	101611
14	17765.72921	18053	101616
15	17794.35454	18083	101622
16	17822.97837	18113	101627
17	17851.60069	18143	101633
18	17880.22151	18173	101638
19	17908.84081	18203	101643
20	17937.45859	18233	101649
21	17966.07485	18263	101654
22	17994.68960	18293	101659
23	18023.30282	18323	101665
24	18051.91452	18353	101670
25	18080.52469	18383	101676
26	18109.13333	18414	101681
27	18137.74044	18444	101687
28	18166.34601	18474	101692
29	18194.95005	18504	101698
30	18223.55254	18534	101703

	Sinus	Tangens	Secans
60	98430.77530	567128	575877
59	98475.71991	566165	574929
58	98470.65619	565205	573983
57	98465.58414	564248	573041
56	98460.50375	563295	572102
55	98455.41504	562344	571166
54	98450.31799	561397	570234
53	98445.21262	560452	569304
52	98440.09891	559511	568377
51	98434.97687	558573	567454
50	98429.84651	557638	566533
49	98424.70781	556706	565616
48	98419.56079	555777	564701
47	98414.40544	554851	563790
46	98409.24176	553927	562881
45	98404.06976	553007	561976
44	98398.88943	552090	561073
43	98393.70077	551176	560174
42	98388.50379	550264	559277
41	98383.29848	549356	558383
40	98378.08485	548451	557493
39	98372.86289	547548	556605
38	98367.63261	546648	555729
37	98362.39400	545751	554837
36	98357.14708	544857	553958
35	98351.89183	543966	553081
34	98346.62825	543077	552208
33	98341.35636	542192	551337
32	98336.07614	541309	550468
31	98330.78761	540429	549603
30	98325.49075	539552	548740
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10	Sinus	Tangens	Secans
30	18223.55254	18534	101703
31	18252.15350	18564	101708
32	18280.75291	18594	101714
33	18309.35077	18624	101720
34	18337.94709	18654	101725
35	18366.54185	18684	101731
36	18395.13506	18714	101736
37	18423.72671	18745	101742
38	18452.31680	18775	101747
39	18480.90533	18805	101753
40	18509.49230	18835	101758
41	18538.07770	18866	101764
42	18566.66153	18895	101769
43	18595.24380	18925	101775
44	18623.82448	18955	101781
45	18652.40360	18986	101786
46	18680.98113	19016	102792
47	18709.55708	19046	101798
48	18738.13145	19076	101803
49	18766.70424	19106	101809
50	18795.27544	19136	101815
51	18823.84504	19166	101820
52	18852.41305	19197	101826
53	18880.97947	19227	101832
54	18909.54429	19257	101837
55	18938.10751	19287	101843
56	18966.66913	19317	101849
57	18995.22915	19347	101854
58	19023.78755	19378	101860
59	19052.34435	19408	101866
60	19080.89953	19438	101872

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	98325.49075	539552	548740
29	98320.18557	538677	547881
28	98314.87208	537805	547023
27	98309.55026	536936	546169
26	98304.22013	536070	545317
25	98298.88168	535206	544468
24	98293.53491	534345	543622
23	98288.17982	533487	542778
22	98282.81642	532631	541937
21	98277.44470	531778	541099
20	98272.06467	530928	540263
19	98266.67631	530080	539430
18	98261.27965	529235	538600
17	98255.87467	528393	537772
16	98250.46138	527553	536947
15	98245.03977	526715	536124
14	98239.60985	525880	535304
13	98234.17161	525048	534486
12	98228.72507	524218	533671
11	98223.27021	523391	532859
10	98217.80704	522566	532049
9	98212.33556	521744	531241
8	98206.85577	520925	530436
7	98201.36767	520107	529634
6	98195.87126	519293	528833
5	98190.36655	518480	528036
4	98184.85352	517671	527241
3	98179.33219	516863	526448
2	98173.80254	516058	525658
1	98168.26460	515256	524870
0	98162.71834	514455	524084

I	Sinus	Tangens	Secans
0	19080.89953	19438	101872
1	19109.45310	19468	101877
2	19138.00505	19498	101883
3	19166.55539	19529	101889
4	19195.10410	19559	101895
5	19223.65119	19589	20:901
6	19252.19665	19619	101906
7	19280.74048	19649	101912
8	19309.28268	19680	101918
9	19337.82325	19710	101924
10	19366.36218	19740	101930
11	19394.89947	19770	101936
12	19423.43512	19801	101941
13	19451.96912	19831	101947
14	19480.50148	19861	101953
15	19509.03220	19891	101959
16	19537.56126	19921	101965
17	19566.08867	19952	101971
18	19594.61442	19982	101977
19	19623.13851	20012	101983
20	10651.66095	20042	101989
21	19680.18172	20073	101995
22	19708.70083	20103	102001
23	19737.21826	20133	102007
24	19765.73403	20164	102013
25	19794.24813	20194	102019
26	19822.76055	20224	102025
27	19851.27129	20254	102031
28	19879.78036	20285	102037
29	19908.28774	20315	102043
30	19936.79344	20345	102049

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	98162.71834	514455	524084
59	98157.16378	513658	523301
58	98151.60091	512862	522520
57	98146.02974	512069	521742
56	98140.45026	511279	520966
55	98134.86248	510490	520193
54	98129.26639	509704	519421
53	98123.66201	508921	518652
52	98118.04931	508139	517886
51	98112.42832	507360	517121
50	98106.79902	506584	516359
49	98101.16143	505809	515599
48	98095.51553	505037	514842
47	98089.86133	504267	514087
46	98084.19883	503499	513334
45	98078.52804	502734	512583
44	98072.84894	501971	511835
43	98067.16154	501210	511088
42	98061.46585	500451	510344
41	98055.76186	499695	509602
40	98050.04957	498940	508863
39	98044.32899	498188	508125
38	98038.60011	497438	507390
37	98032.86293	496690	506657
36	98027.11746	495945	505926
35	98021.36369	495201	505197
34	98015.60163	494460	504471
33	98009.83128	493721	503746
32	98004.05263	492984	503024
31	97998.26569	492249	502303
30	97992.47046	491516	501585
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I I	Sinus	Tangens	Secans
30	19936.79344	20345	102049
31	19965.29745	20376	102055
32	19993.79977	20406	102061
33	20022.30040	20436	102067
34	20050.79933	20466	102073
35	20079.29657	20497	102079
36	20107.79211	20527	102085
37	20136.28595	20557	102091
38	20164.77808	20588	102097
39	20193.26851	20618	102103
40	20221.75723	20648	102110
41	20250.24424	20679	102116
42	20278.72953	20709	102122
43	20307.21311	20739	102128
44	20335.69497	20770	102134
45	20364.17511	20800	102140
46	20392.65353	20830	102146
47	20421.13022	20861	102153
48	20449.60518	20891	102159
49	20478.07841	20921	102165
50	20506.54991	20952	102171
51	20535.01968	20982	102178
52	20563.48770	21013	102184
53	20591.95399	21043	102190
54	20620.41853	21073	102196
55	20648.88133	21104	102203
56	20677.34239	21134	102209
57	20705.80169	21164	102215
58	20734.25924	21195	102221
59	20762.71504	21225	102228
60	20791.16908	21256	102234

	Sinus	Tangens	Secans
30	97992 47046	491516	501585
29	97986 66663	490785	500869
28	97980 85512	490056	500155
27	97975 03501	489330	499443
26	97969 20662	488605	498733
25	97963 36993	487882	498025
24	97957 52495	487162	497320
23	97951 67169	486444	496616
22	97945 81014	485727	495914
21	97939 94036	485013	495215
20	97934 06217	484300	494517
19	97928 17576	483590	493821
18	97922 28106	482882	493128
17	97916 37807	482175	492436
16	97910 46680	481471	491746
15	97904 54724	480769	491058
14	97898 61940	480068	490373
13	97892 68328	479370	489689
12	97886 73887	478673	489007
11	97880 78618	477978	488327
10	97874 82521	477286	487649
9	97868 85595	476595	486973
8	97862 87842	475906	486299
7	97856 89260	475219	485627
6	97850 89851	474534	484956
5	97844 89613	473851	484288
4	97838 88547	473170	483621
3	97832 86654	472490	482956
2	97826 83933	471813	482294
1	97820 80384	471137	481633
0	97814 76007	470463	480973
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12	Sinus	Tangens	Secans
0	20791.16908	21256	102234
1	20819.62136	21286	102240
2	20848.07188	21316	102247
3	20876.52063	21347	102253
4	20904.96762	21377	102259
5	20933.41284	21408	102266
6	20961.85629	21438	102272
7	20990.29796	21469	102279
8	21018.73786	21499	102285
9	21047.17598	21529	102291
10	21075.61232	21560	102298
11	21104.04687	21590	102304
12	21132.47964	21621	102311
13	21160.91062	21651	102317
14	21189.33981	21682	102323
15	21217.76721	21712	102330
16	24246.19281	21743	102336
17	21274.61662	21773	102343
18	21303.03862	21804	102349
19	21331.45882	21834	102356
20	21359.87722	21864	102362
21	21388.29381	21895	102369
22	21416.70859	21925	102375
23	21445.12156	21956	102382
24	21473.53271	21986	102388
25	21501.94205	22017	102395
26	21530.34956	22047	102402
27	21558.75526	22078	102408
28	21587.15913	22108	102415
29	21615.56117	22139	102421
30	21643.96139	22169	102628

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	97814.76007	470463	480973
59	97808.70802	469791	480316
58	97802.64770	469121	479661
57	97796.57911	468452	479007
56	97790.50224	467786	478355
55	97784.41709	467121	477705
54	97778.32367	466458	477057
53	97772.22198	465797	476411
52	97766.11201	465138	475766
51	97759.99377	464480	475123
50	97753.86726	463825	474482
49	97747.73248	463171	473843
48	97741.58942	462518	473205
47	97735.43810	461868	472569
46	97729.27851	461219	471935
45	97723.11064	460572	471303
44	97716.93451	459927	470673
43	97710.75011	459283	470044
42	97704.55744	458641	469417
41	97698.35650	458001	468791
40	97692.14730	457363	468167
39	97685.92983	456726	467545
38	97679.70409	456091	466925
37	97673.47009	455458	466307
36	97667.22783	454826	465690
35	97660.97730	454196	465074
34	97654.71851	453568	464461
33	97648.45145	452941	463849
32	97642.17613	452316	463238
31	97635.89255	451693	462630
30	97629.60071	451071	462023
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12	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	21643.96139	22169	102428
31	21672.35977	22200	102435
32	21700.75632	22231	102441
33	21729.15104	22261	102448
34	21757.54391	22292	102455
35	21785.93494	22322	102461
36	21814.32413	22253	102468
37	21842.71148	22383	102474
38	21871.09698	22414	102481
39	21899.48062	22444	102488
40	21927.86241	22475	102494
41	21956.24235	22505	102501
42	21984.62043	22536	102508
43	22012.99665	22567	102515
44	22041.37101	22597	102521
45	22069.74350	22628	102528
46	22098.11412	22658	102535
47	22126.48288	22689	102542
48	22154.84976	22719	102548
49	22183.21476	22750	102555
50	22211.57789	22781	102562
51	22239.93914	22811	102569
52	22268.29851	22842	102576
53	22296.65600	22872	102582
54	22325.01160	22903	102589
55	22353.36530	22934	102596
56	22381.71712	23964	102603
57	22410.06705	22995	102610
58	22438.41507	23026	102617
59	22466.76120	23056	102624
60	22495.10543	23087	102630

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	97629.60071	451071	462023
29	97623 30060	450451	461417
28	97616.99224	449832	460813
27	97610 67562	449215	460211
26	95604.35073	448600	459611
25	97598.01759	447986	459012
24	97591.67619	447374	458414
23	97585.32653	446764	457819
22	97578.96861	446155	457224
21	97572.60244	445548	456632
20	97566.22801	444942	456041
19	97559.84533	444338	455451
18	97553.45439	443735	454863
17	97547.05520	443134	454277
16	97540.64775	442534	453692
15	97534.23205	441936	453109
14	97527.80809	441340	452527
13	97521.37588	440745	451947
12	97514.93543	440152	451368
11	97508.48672	439560	450791
10	97502.02975	438969	450216
9	97495.56454	438381	449642
8	97489.09108	437793	449069
7	97482.60937	437207	448498
6	97476.11941	436623	447928
5	97469.62121	436040	447360
4	97463.11475	435459	446793
3	97456.60005	434879	446228
2	97450 07711	434300	445664
1	97443.54591	433723	445102
0	97437.00647	433148	444541
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13	Sinus	Tangens	Secans
01	22495.10543	23087	102630
1	22523.44775	23117	102637
2	22551.78817	23148	102644
3	22580.12668	23179	102651
4	22608.46328	23209	102658
5	22636.79797	23240	102665
6	22665.13074	23271	102672
7	22693.46159	23301	102679
8	22721.79052	23332	102686
9	22750.11753	23363	102693
10	22778.44262	23393	102700
11	22806.76578	23424	102707
12	22835.08701	23455	102714
13	22863.40630	23485	102721
14	22891.72366	23516	102728
15	22920.03909	23547	102735
16	22948.35257	23578	102742
17	22976.16412	23608	102749
18	23004.97371	23639	102756
19	23033.28137	23670	102763
20	23061.58707	23700	102770
21	23089.89082	23731	102777
22	23118.19262	23762	102784
23	23146.49246	23793	102791
24	23174.79034	23823	102799
25	23203.08627	23854	102806
26	23231.38023	23885	102813
27	23259.67222	23916	102820
28	23287.96224	23946	102827
29	23316.25030	23977	102834
30	23344.53638	24008	102842

	Sinus	Tangens	Secans
60	97437 00647	433148	444541
59	97430.45879	432573	443982
58	97423.90286	432001	443424
57	97417.33869	431430	442867
56	97410.76628	430860	442312
55	97404.18562	430291	441759
54	97397.59672	429724	441206
53	97390.99958	429159	440656
52	97384.39420	428595	440106
51	97377.78058	428032	439558
50	97375.15872	427471	439012
49	97364.52862	426911	438466
48	97357.89028	426352	437923
47	97351.24371	425796	437380
46	97344.58889	425239	436839
45	97337.92584	424685	436299
44	97331.25455	424132	433761
43	97324.57503	423580	435224
42	97317.88727	423030	434689
41	97311.19128	422481	434154
40	97304.48705	421933	433621
39	97297.77459	421387	433090
38	97291.05390	420842	432560
37	97284.32497	420298	432031
36	97277.58782	419756	431503
35	97270.84243	419215	430977
34	97264.08881	418675	430452
33	97257.32696	418137	429929
32	97250.55688	417600	429406
31	97243.77857	417064	428885
30	97236.99203	416520	428366
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13	Sinus	Tangens	Secans
30	23344.53638	24008	102842
31	23372.82049	24039	102849
32	23401.10262	24069	102856
33	23429.38276	24100	102863
34	23457.66093	24131	102870
35	23485.93711	24162	102878
36	23514.21131	24193	102885
37	23542.48351	24223	102892
38	23570.75372	24254	102899
39	23599.02194	24285	102907
40	23627.28816	24316	102914
41	23655.55238	24347	102921
42	23683.81460	24377	102928
43	23712.07482	24408	102936
44	23740.33303	24439	102943
45	23768.58923	24470	102950
46	23796.84342	24501	102958
47	23825.09559	24532	102965
48	23853.34575	24562	102972
49	23881.59389	24593	102980
50	23901.04002	24624	102987
51	23938.08411	24655	102994
52	23966.32618	24686	103002
53	23994.56623	24717	103009
54	24022.80424	24747	103017
55	24051.04022	24778	103024
56	24079.27417	24809	103032
57	24107.50608	24840	103039
58	24135.73595	24871	103046
59	24163.96377	24902	103054
60	24192.18955	24933	103061

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	97236.99203	416530	428366
29	97230.19727	415997	427847
28	97223.39428	415465	427330
27	97216.58306	414934	426814
26	97209.76362	414405	426300
25	97202.93595	413877	425787
24	97196.10005	413350	425275
23	97189.25593	412825	424764
22	97182.40559	412301	424255
21	97175.54303	411778	423746
20	97168.67424	411256	423239
19	97161.79723	410736	422734
18	97154.91199	410216	422229
17	97148.01854	409699	421726
16	97141.11687	409182	421224
15	97134.20698	408666	420723
14	97127.28886	408152	420224
13	97120.36253	407639	419725
12	97113.42799	407127	419228
11	97106.48522	406616	418733
10	97099.53424	406107	418238
9	97092.57504	405599	417744
8	97085.60763	405092	417252
7	97078.63200	404586	416761
6	97071.64815	404081	416271
5	97064.65610	403578	415782
4	97057.65582	423075	415295
3	97050.64734	402574	414809
2	97043.63065	402074	414323
1	97036.60574	401576	413839
0	97029.57262	401078	413357

X 4	Sinus	Tangens	Secans
0	24192.18955	24933	103061
1	24220.41329	24964	103069
2	24248.63497	24995	103076
3	24276.85461	25026	103084
4	24305.07219	25056	103091
5	24333.28778	25087	103099
6	24361.50117	25118	103106
7	24389.71258	25149	103114
8	24417.92191	25180	103121
9	24446.12919	25211	103129
10	24474.33439	25242	103137
11	24502.53752	25273	103144
12	24530.73858	25304	103152
13	24558.93757	25335	103159
14	24587.13447	25366	103167
15	24615.32930	25397	103175
16	24643.52204	25428	103182
17	24671.71270	25459	103190
18	24699.90127	25490	103197
19	24728.08775	25521	103205
20	24756.27213	25556	103213
21	24784.45443	25583	103220
22	24812.63462	25614	103228
23	24840.81272	25645	103236
24	24868.98871	25676	103244
25	24897.16260	25707	103251
26	24925.33438	25738	103259
27	24953.50406	25769	103267
28	24981.67162	25800	103275
29	25009.83707	25831	103282
30	25038.00040	25862	103290

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	97029.57262	401078	413357
59	97022.53129	400582	412875
58	97015.45176	400086	412394
57	97008.42401	399592	411915
56	97001.35806	399099	411437
55	96994.28389	398607	410960
54	96987.20152	398117	410484
53	96980.11095	397627	410009
52	96473.01216	397139	409535
51	96965.90518	396651	409063
50	96958.78998	396165	408591
49	96951.66659	395680	408121
48	96944.53498	395196	407652
47	96937.39518	394713	407184
46	96930.24717	394232	406717
45	96923.09097	393751	406251
44	96915.92656	393271	405786
43	96908.75395	392793	405322
42	96901.57314	392316	404860
41	96894.38413	391839	404398
40	96887.18692	391364	403938
39	96879.98151	390890	403479
38	96872.76791	390417	403020
37	96865.54611	389945	402563
36	96858.31611	390474	402107
35	96851.07791	389004	401652
34	96843.83153	388536	401198
33	96836.57694	388068	400745
32	96829.31417	387601	400293
31	96822.04320	387136	399843
30	96814.76403	386671	399393
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14	Sinus	Tangens	Secans
30	25038.00040	25862	103290
31	25066.16161	25893	103298
32	25094.32071	25924	103306
33	25122.47768	25955	103313
34	25150.63252	25986	103321
35	25178.78523	26017	103329
36	25206.93582	26048	103337
37	25235.08427	26079	103345
38	25263.23059	26110	103353
39	25291.37477	26141	103360
40	25319.51681	26172	103368
41	25347.65670	26203	103376
42	25375.79445	26235	103384
43	25403.93006	26266	103392
44	25432.06351	26297	103400
45	25460.19482	26328	103408
46	25488.32596	26359	103416
47	25516.45096	26390	103424
48	25544.57579	26421	103431
49	25572.69846	26452	103439
50	25600.81897	26483	103447
51	25628.93751	26515	103455
52	25657.05342	26546	103463
53	25685.16748	26577	103471
54	25713.27952	26608	103479
55	25741.38896	26639	103487
56	25769.49644	26670	103495
57	25797.60173	26701	103503
58	25825.70484	26733	103511
59	25853.80577	26764	103520
60	25881.90451	16795	103528

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	96814.76403	386671	399392
29	96807.47668	386208	398944
28	96800.18113	385745	398497
27	96792.87739	385284	398050
26	96785.56547	384824	397604
25	96778.24535	389364	397160
24	96770.91704	383906	396716
23	96763.58055	384439	396274
22	96756.23587	382992	395832
21	96748.88300	382537	395392
20	96741.52194	382083	394952
19	96734.15270	381630	394514
18	96726.77527	381177	394076
17	96719.38966	380726	393640
16	96711.99587	380276	393204
15	99704.59389	379827	392770
14	96697.18372	379378	392337
13	96689.76538	378931	391904
12	96682.33886	378485	391473
11	96674.90415	378040	391042
10	96667.46126	377595	390612
9	96660.01020	377152	390284
8	96652.55095	376709	389756
7	96645.08353	376268	389330
6	96637.60793	375828	388904
5	96630.12415	375388	388479
4	96622.63249	374950	388056
3	96615.13206	374512	387633
2	96607.62376	374075	387211
1	96600.10728	373640	386790
0	96592.58262	373205	386370

15	Sinus	Tangens	Secans
0	25881.90451	26795	103528
1	25910.00105	26826	103536
2	25938.09541	26857	103544
3	25966.18757	26888	103552
4	25994.27753	26920	103560
5	26022.36530	26951	103568
6	26050.45086	26982	103576
7	26078.53422	27013	103584
8	26106.61537	27044	103592
9	26134.69431	27076	103601
10	26162.77104	27107	103609
11	26190.84556	27138	103617
12	26218.91786	27169	103625
13	26246.98794	27201	103633
14	26275.05580	27232	103642
15	26303.12144	27263	103650
16	26331.18485	27294	103658
17	26359.24694	27326	103666
18	26387.30499	27357	103674
19	26415.36171	27388	103683
20	26443.41620	27419	103691
21	26471.46845	27451	103699
22	26499.51846	27482	103708
23	26527.56622	27513	103716
24	26555.61174	27545	103724
25	26583.65502	27576	103732
26	26611.69604	27607	103741
27	26639.73482	27638	103749
28	26667.77134	27670	103757
29	26695.80560	27701	103766
30	26723.83760	27732	103774

	Sinus	Tangens	Secans
60	96592.58262	373205	386370
59	96585.04980	372771	385951
58	96577.50880	372338	385533
57	96569.95962	371907	385116
56	96562.40228	371476	384700
55	96554.83677	371046	384285
54	96547.26308	370616	383871
53	96539.68123	370188	383457
52	96532.09121	369761	383045
51	96524.49302	369335	382633
50	96516.88666	368909	382222
49	96509.27213	368485	381813
48	96501.64944	368061	381404
47	96494.01859	367638	380996
46	96486.37956	367217	380589
45	96478.73238	366796	380183
44	96471.07703	366376	379778
43	96463.41352	365957	379374
42	96455.74284	365538	378970
41	96448.06200	365121	378568
40	96440.37401	364705	378166
39	96432.67785	364289	377765
38	96424.97353	363874	377365
37	96417.26105	363461	376966
36	96409.54042	363048	376568
35	96401.81163	362626	376171
34	96394.07468	362224	375775
33	96386.32957	361814	375379
32	96378.57631	361405	374984
31	96370.81489	360996	374591
30	96363.04532	360588	374198
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15	Sinus	Tangens	Secans
30	26723.83760	27732	103774
31	26751.86735	27764	103783
32	26779.89482	27795	103791
33	26807.92094	27826	103800
34	26835.94298	27858	103808
35	26863.96366	27889	103816
36	26891.98206	27920	103825
37	26919.99818	27952	103833
38	26948.01203	27983	103842
39	26976.02360	28015	103850
40	27004.03288	28046	103858
41	27032.03988	28077	103867
42	27060.04459	28109	103875
43	27088.04702	28140	103884
44	27116.04715	28172	103892
45	27144.04498	28203	103901
46	27172.04052	28234	103909
47	27200.03376	28266	103918
48	27228.02470	28297	103927
49	27256.01333	28329	103935
50	27283.99966	28360	103944
51	27311.98368	28391	103952
52	27339.96539	28423	103961
53	27367.94478	28454	103969
54	27395.92186	28486	103978
55	27423.89663	28517	103987
56	27451.86907	28549	103995
57	27479.83918	28580	104004
58	27507.80698	28612	104013
59	27535.77244	28643	104021
60	27563.73558	28675	104030

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	96363.04532	360588	374198
29	96355.26759	360182	373806
28	96347.48171	359775	373414
27	96339.68768	359370	373024
26	96331.88550	358966	372635
25	96324.07516	358562	372246
24	96316.25067	358160	371858
23	96308.43004	357758	371471
22	96300.59525	357357	371085
21	96292.75232	356957	370700
20	96284.90124	356557	370315
19	96277.04201	356159	369931
18	96269.17464	355761	369549
17	96261.29912	355364	369167
16	96253.41545	354968	368785
15	96245.52364	354573	368405
14	96237.62369	354179	368025
13	96229.71559	353785	367647
12	96221.79935	353393	367269
11	96213.87497	353001	366892
10	96205.94244	352609	366515
9	96198.00178	352219	366140
8	96190.05297	351829	365765
7	96182.09603	351441	365391
6	96174.13095	351053	365018
5	96166.15773	350666	364645
4	96154.17637	350279	364274
3	96150.18688	349894	363903
2	96142.18925	349509	363533
1	96134.18349	349125	363164
0	96126.16959	348741	362796
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16	Sinus	Tangens	Secans
0	27563.73558	28675	104030
1	27591.69638	28706	104039
2	27619.65485	28738	104047
3	27647.61098	28769	104056
4	27675.56477	28800	104065
5	27703.51622	28832	104073
6	27731.46533	28864	104082
7	27759.41208	28895	104091
8	27787.35649	28927	104100
9	27815.29855	28958	104108
10	27843.23826	28990	104117
11	27871.17561	29021	104126
12	27899.11060	29053	104135
13	27927.04323	29084	104144
14	27954.97350	29116	104152
15	27982.90140	29147	104161
16	28010.82693	29179	104170
17	28038.75010	29210	104179
18	28066.67089	29242	104188
19	28094.58930	29274	104197
20	28122.50534	29305	104206
21	28150.41900	29337	104214
22	28178.33028	29368	104223
23	28206.23917	29400	104232
24	28234.14568	29432	104241
25	28262.04980	29463	104250
26	28289.95152	29495	104259
27	28317.85085	29526	104268
28	28345.74779	29558	104277
29	28373.64233	29590	104286
30	28401.53447	29621	104295

	Sinus	Tangens	Secans
60	96126.16959	348741	362796
59	96118.14756	348359	362428
58	96110.11739	347977	362061
57	96102.07909	347596	361695
56	96094.03266	347216	361330
55	96085.97810	346837	360965
54	96077.91541	346458	360601
53	96069.84459	346080	360238
52	96061.76564	345703	359876
51	96053.67856	345327	359514
50	96045.58336	344951	359154
49	96037.48002	344576	358794
48	96029.36856	344202	358434
47	96021.24898	343829	358076
46	96013.12127	343456	357718
45	96004.98543	343084	357361
44	95996.84148	342713	357005
43	95988.68940	342343	356649
42	95980.52919	341973	356294
41	95972.36087	341604	355940
40	95964.18442	341236	355587
39	95955.99986	340869	355234
38	95947.80717	340502	354883
37	95939.60637	340136	354531
36	95931.39745	339771	354181
35	95923.18041	339406	353831
34	95914.95526	339042	353482
33	95906.72198	338679	353134
32	95898.48060	338317	352787
31	95890.23110	337955	352440
30	95881.97348	337594	352094
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16	Sinus	Tangens	Secans
30	28401.53447	29621	104295
31	28429.42420	29653	104304
32	28457.31153	29685	104313
33	28485.19645	29716	104322
34	28513.07896	29748	104331
35	28540.95905	29780	104340
36	28568.83674	29811	104349
37	28596.71200	29843	104358
38	28624.58484	29875	104367
39	28652.45527	29906	104376
40	28680.32327	29938	104385
41	28708.18884	29970	104394
42	28736.05198	30002	104403
43	28763.91269	30033	104413
44	28791.77097	30065	104422
45	28819.62681	30097	104431
46	28847.48021	30128	104440
47	28875.33117	30160	104449
48	28903.17969	30192	104458
49	28931.02576	30224	104468
50	28958.86939	30255	104477
51	28986.71056	30287	104486
52	29014.54928	30319	104495
53	29042.38555	30351	104504
54	29070.21935	30382	104514
55	29098.05070	30414	104523
56	29125.87959	30446	104532
57	29153.70601	30478	104541
58	29181.52997	30509	104551
59	29209.35145	30541	104560
60	29237.17047	30573	104569

	Sinus	Tangens	Secans
30	95881.97348	337194	352094
29	95873.70775	337234	351748
28	95865.43391	336875	351404
27	95857.15196	336516	351060
26	95848.86190	336158	350716
25	95840.56372	335800	350374
24	95832.25744	335443	350032
23	95823.94305	335087	349691
22	95815.62055	334732	349350
21	95807.28994	334377	349010
20	95798.95123	334023	348671
19	95790.60441	333670	348333
18	95782.74948	333317	347995
17	95773.88645	332965	347658
16	95765.51531	332614	347321
15	95757.13608	332264	346986
14	95748.74873	331914	346651
13	95740.35329	331565	346316
12	95731.94975	331216	345983
11	95723.53810	330868	345650
10	95715.11836	330521	345317
9	95706.69052	330174	344986
8	95698.25458	329829	344655
7	95689.81054	329483	344324
6	95681.35840	329139	343995
5	95672.89817	328795	343666
4	95664.42984	328452	343337
3	95655.95342	328109	343010
2	95647.46890	327767	342683
1	95638.97629	327426	342356
0	95630.47559	327085	342030
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17	Sinus	Tangens	Secans
0	29237.17047	30573	104569
1	29264.98701	30605	104578
2	29292.80107	30637	104588
3	29320.61266	30669	104597
4	29348.42176	30700	104606
5	29376.22838	30732	104616
6	29404.03252	30764	104625
7	29431.83417	30796	104635
8	29459.63332	30828	104644
9	29487.42999	30860	104653
10	29515.22416	30891	104663
11	29543.01583	30923	104672
12	29570.80500	30955	104682
13	29598.59167	30987	104691
14	29626.37583	31019	104700
15	29654.15749	31051	104710
16	29681.93664	31083	104719
17	29709.71328	31115	104729
18	29737.48740	31147	104738
19	29765.25901	31178	104748
20	29793.02810	31210	104757
21	29820.79467	31242	104767
22	29848.55871	31274	104776
23	29876.32023	31306	104786
24	29904.07922	31338	104795
25	29931.83568	31370	104805
26	29959.58961	31402	104815
27	29987.34100	31434	104824
28	30015.08986	31466	104834
29	30042.83617	31498	104843
30	30070.57995	31530	104853

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	95630.47559	327085	342030
59	95621.96680	326745	341705
58	95613.44991	326406	341381
57	95604.42494	326067	341057
56	95596.39187	325729	340734
55	95587.85072	325392	340411
54	95579.30147	325055	340089
53	95570.74414	324719	339768
52	95562.17873	324383	339448
51	95553.60523	324049	339128
50	95545.02364	323714	338808
49	95536.43396	323381	338489
48	95527.83621	323048	338171
47	95519.23037	322715	337854
46	95510.61644	322384	337537
45	95501.99444	322053	337221
44	95493.36436	321722	336905
43	95484.72619	321392	336590
42	95476.07995	321063	336276
41	95467.42562	320734	335962
40	95458.76322	320406	335649
39	95450.09274	320079	335336
38	95441.41418	319752	335025
37	95432.72755	319426	334713
36	95424.03285	319100	334403
35	95415.33007	318775	334092
34	95406.61921	318451	333783
33	95397.90028	318127	333474
32	95389.17328	317804	333166
31	95380.43821	317481	332858
30	95371.69507	317159	332551
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17	Sinus	Tangents	Secans
30	30070.57995	31530	104853
31	30098.32117	31562	104863
32	30126.05986	31594	104872
33	30153.79599	31626	104882
34	20181.52957	31658	104891
35	30209.26060	31690	104901
36	30236.98907	31722	104911
37	30264.71498	31754	104920
38	30292.43834	31786	104930
39	30320.15912	31818	104940
40	30347.87735	31850	104950
41	30375.59300	31882	104959
42	30403.30609	31914	104969
43	30431.01660	31946	104979
44	30458.72454	31978	104989
45	30486.42990	32010	104998
46	30514.13268	32042	105008
47	30541.83288	32074	105018
48	30569.53049	32106	105028
49	30597.22552	32139	105038
50	30624.91796	32171	105047
51	30652.60780	32203	105057
52	30680.29506	32235	105067
53	30707.97972	32267	105077
54	30735.66177	32299	105087
55	30763.34123	32331	105097
56	30791.01809	32363	105107
57	30818.69234	32396	105116
58	30846.36398	32428	105126
59	30874.03301	32460	105136
60	30901.69943	32492	105146

	Sinus	Tangens	Secans
30	95371.69507	317159	332551
29	95362.94386	316838	332244
28	95354.18458	316517	331939
27	95345.41723	316197	331633
26	95336.64181	315877	331328
25	95327.85833	315558	331024
24	95319.06677	315240	330721
23	95310.26716	314922	330418
22	95301.45948	314605	330115
21	95292.64373	314288	329814
20	95283.81992	313972	329512
19	95274.98805	313656	329212
18	95266.14812	313341	328912
17	95257.30013	313027	328612
16	95248.44407	312713	328313
15	95239.57996	312400	328015
14	95230.70779	312087	327717
13	95221.82756	311775	327420
12	95212.93927	311464	327123
11	95204.04293	311153	326827
10	95195.13853	310842	326531
9	95186.22607	310532	326237
8	95177.30556	310223	325942
7	95168.37700	309914	325648
6	95159.44038	309606	325355
5	95150.49572	309298	325062
4	95141.54300	308991	324770
3	95132.58223	308685	324478
2	95123.61341	308379	324187
1	95114.63654	308073	323897
0	95105.65162	307768	323607
72			

18	Sinus	Tangens	Secans
0	30901.69943	32492	105146
1	30929.36324	32524	105156
2	30957.02443	32556	105166
3	30984.68299	32588	105176
4	31012.33894	32621	105186
5	31039.99226	32653	105196
6	31067.64296	32685	105206
7	31095.29103	32717	105216
8	31122.93646	32749	105226
9	31150.57926	32782	105236
10	31178.21943	32814	105246
11	31205.85696	32846	105256
12	31233.49185	32878	105266
13	31261.12409	32911	105276
14	31288.75369	32943	105286
15	31316.38064	32975	105296
16	31344.00495	33007	105307
17	31371.62660	33040	105317
18	31399.24559	33072	105327
19	31426.86193	33104	105337
20	31454.47561	33136	105347
21	31482.08663	33169	105357
22	31509.69498	33201	105367
23	31537.30067	33233	105378
24	31564.90369	33266	105388
25	31592.50404	33298	105398
26	31620.10171	33330	105408
27	31647.69671	33363	105418
28	31675.28903	33395	105429
29	31702.87868	33427	105439
30	31730.46564	33460	105449

	Sinns	Tangens	Secans
60	95105.65162	307763	323607
59	95096.65866	307464	323317
58	95087.65765	307160	323028
57	95078.64859	306857	322740
56	95068.63149	306554	322452
55	95060.60635	306252	322165
54	95051.57316	305950	321878
53	95042.53193	305649	321592
52	95033.48265	305349	321306
51	95024.42534	305049	321021
50	95015.35998	304749	320737
49	95006.28658	304450	320453
48	94997.20515	304152	320169
47	94988.11567	303854	319886
46	94979.01816	303556	319604
45	94969.91262	303260	319322
44	94960.79903	302963	319040
43	94951.67741	302667	318759
42	94942.54776	302372	318479
41	94933.41007	302077	318199
40	94924.26435	301783	317920
39	94915.11060	301489	317641
38	94905.94882	301196	317363
37	94896.77900	300903	317085
36	94887.60116	300611	316808
35	94878.41529	300319	316531
34	94869.22139	300028	316255
33	94860.01946	299738	315979
32	94850.80950	299447	315704
31	94841.59152	299158	315429
30	94832.36552	298866	315155
71			

18	Sinus	Tangens	Secans
30	31730.46564	33460	105449
31	31758.04991	33492	105459
32	31785.63150	33524	105470
33	31813.21039	33557	105480
34	31840.78660	33589	105490
35	31868.36011	33621	105501
36	31895.93092	33654	105511
37	31923.49904	33686	105521
38	31951.06445	33718	105532
39	31978.62717	33751	105542
40	32006.18717	33783	105552
41	32033.74447	33816	105563
42	32061.29905	33848	105573
43	32088.85093	33881	105584
44	32116.40008	33913	105594
45	32143.94653	33945	105604
46	32171.49025	33978	105615
47	32199.03124	34010	105625
48	32226.56952	34043	105636
49	32254.10506	34075	105646
50	32281.63788	34108	105657
51	32309.16797	34140	105667
52	32336.69532	34173	105678
53	32364.21994	34205	105688
54	32391.74181	34238	105699
55	32419.26095	34270	105709
56	32446.77735	34303	105720
57	32474.29099	34335	105730
58	32501.80189	34368	105741
59	32529.31004	34400	105751
60	32556.81544	34433	105762

	Sinus	Tangens	Secans
30	94832.36552	298868	315155
29	91823.13149	298580	314881
28	94813.88943	298292	314608
27	94804.63935	298004	314335
26	94795.38126	297717	314063
25	94786.11514	297430	313791
24	94776.84100	296144	313520
23	94767.55884	296858	313249
22	94758.26866	296573	312979
21	94748.97046	296288	312709
20	94739.66425	296004	312440
19	94730.35002	295720	312171
18	94721.02737	295437	311903
17	94711.69751	295155	311635
16	94702.35923	294872	311367
15	94693.01294	294590	311101
14	94683.65864	294309	310834
13	94674.29633	294028	310568
12	94664.92601	293748	310303
11	94655.54767	293468	310038
10	94646.16133	293189	309774
9	94636.76698	292910	309510
8	94627.36462	292632	309246
7	94617.95425	292354	308983
6	94608.53588	292076	308721
5	94599.10950	291799	308459
4	94589.67512	291523	308197
3	94580.23273	291246	307936
2	94570.78234	290971	307675
1	94561.32395	290696	307415
0	94551.85755	290421	307155
71			

19	Sinus	Tangens	Secans
0	32556.81544	34433	105762
1	32584.31808	34465	105773
2	32611.81797	34498	105783
3	32639.31509	34530	105794
4	32666.80946	34563	105805
5	32694.30106	34596	105815
6	32721.78989	34628	105826
7	32749.27596	34661	105836
8	32776.75925	34693	105847
9	32804.23977	34726	105858
10	32831.71752	34758	105869
11	32859.19243	34791	105879
12	32886.69467	34824	105890
13	32914.13407	34856	105901
14	32941.60069	34889	105911
15	32969.06452	34922	105922
16	32996.52556	34954	105933
17	33023.98381	34987	105944
18	33051.43927	35019	105955
19	33078.89192	35052	105965
20	33106.34178	35085	105976
21	33133.78884	35117	105987
22	33161.23310	35150	105998
23	33188.67454	35183	106009
24	33216.11318	35216	106019
25	33243.54901	35248	106030
26	33270.98203	35281	106041
27	33298.41223	35314	106052
28	33325.83961	35346	106063
29	33353.26418	35379	106074
30	33380.68592	35411	106085

	Sinus	Tangens	Secans
60	94551.85755	290421	307155
59	94542.38316	290142	306896
58	34532.90077	289873	306637
57	94523.41037	289600	306379
56	94513.91198	289327	306121
55	94504.40560	289055	305864
54	94494.89121	288783	305607
53	94485.36883	288511	305350
52	94475.83845	288240	305094
51	94466.30008	287970	304839
50	94456.75372	287700	304584
49	94447.19937	287430	304329
48	94437.63702	287161	304075
47	94428.06668	286892	303821
46	94418.48835	286624	303568
45	94408.90203	286356	303315
44	94399.30773	286089	303062
43	94389.70543	285822	302810
42	94380.09515	285555	302559
41	94370.47689	285289	302308
40	94360.85063	285023	302057
39	94351.21640	284758	301807
38	94341.57418	284494	301557
37	94331.92397	284229	301308
36	94322.26579	283965	301059
35	94312.25946	283702	300810
34	94302.92548	283439	300562
33	94293.24335	283176	300315
32	94283.55325	282914	300067
31	94273.85516	282653	299821
30	94264.14910	282391	299574
70			

19	Sinus	Tangens	Secan
30	33380.68592	35412	106085
31	33408.10484	35445	106096
32	33435.52093	35477	106107
33	33462.93419	35510	106118
34	33490.34462	35543	106129
35	33517.75221	35576	106140
36	33545.15697	35608	106151
37	33572.55889	35641	106162
38	33599.95797	35674	106173
39	33627.35421	35707	106184
40	33654.74760	35740	106195
41	33682.13814	35772	106206
42	33709.52584	35805	106217
43	33736.91068	35838	106228
44	33764.29267	35871	106239
45	33791.67180	35904	106250
46	33819.04807	35937	106261
47	33846.42141	35969	106272
48	33873.79202	36002	106283
49	33901.15970	36035	106295
50	33928.52451	36068	106306
51	33955.88645	36101	106317
52	33983.24551	36134	106328
53	34010.60170	36167	106339
54	34037.95502	36199	106350
55	34065.30545	36232	106362
56	34092.65302	36265	106373
57	34119.99766	36298	106384
58	34147.33944	36331	106395
59	34174.67833	36364	106407
60	34202.01433	36397	106418

	Sinus	Tangens	Secans
30	94264.14910	282391	299574
29	94254.43507	282130	299329
28	94244.71306	281870	299083
27	94234.98307	281610	298838
26	94225.24511	281350	298594
25	94215.49918	281091	298349
24	94205.74527	280833	298106
23	94195.98340	280574	297862
22	94186.21355	280316	297619
21	94176.43573	280059	297377
20	94166.64995	279802	297135
19	94156.85620	279545	296893
18	94147.05448	279289	296652
17	94137.24479	279033	296411
16	94127.42714	278778	296171
15	94117.60152	278523	295931
14	94107.76794	278269	295691
13	94097.92640	278014	295452
12	94088.07689	277761	295213
11	94078.21942	277507	294975
10	94068.35400	277254	294737
9	94058.48061	277002	294500
8	94048.59926	276750	294263
7	94038.70996	276498	294026
6	94028.81270	276247	293790
5	94018.90748	275996	293554
4	94008.99430	275746	293318
3	93999.07318	275496	293083
2	93989.14410	275246	292849
1	93979.20706	274997	292614
0	93969.26207	274748	292380
70			

20	Sinus	Tangens	Secans
0	34202.01433	36397	106418
1	34229.34743	36430	106429
2	34256.67764	36463	106440
3	34284.00494	36496	106452
4	34311.32935	36529	106463
5	34338.65086	36562	106474
6	34365.96945	36595	106486
7	34393.28514	36628	106497
8	34420.59792	36661	106508
9	34447.90779	36694	106520
10	34475.21474	36727	106531
11	34502.51878	36760	106542
12	34529.81989	36793	106554
13	34557.11809	36826	106565
14	34584.41336	36859	106577
15	34611.70570	36892	106588
16	34638.99512	36925	106600
17	34666.28160	36958	106611
18	34693.56515	36991	106622
19	34720.84577	37024	106634
20	34748.12344	37057	106645
21	34775.39818	37090	106657
22	34802.66998	37123	106668
23	34829.93882	37157	106680
24	34857.20473	37190	106691
25	34884.46768	37223	106703
26	34911.72768	37256	106715
27	34938.98473	37289	106726
28	34966.23882	37322	106738
29	34993.48995	37355	106749
30	35020.73812	37388	106761

	Sinus	Tangens	Secans
60	93969.26207	274748	292380
59	93959.30914	274499	292147
58	93949.34825	274251	291914
57	93939.37941	274004	291681
56	93929.40262	273756	291449
55	93919.41789	273509	291217
54	93909.42520	273263	290986
53	93899.42458	273017	290754
52	93889.41600	272771	290524
51	93879.39948	272526	290293
50	93869.37502	272281	290063
49	93859.34262	272036	289834
48	93849.30227	271792	289605
47	93839.25398	271548	289376
46	93829.19775	271305	289148
45	93819.13359	271062	288920
44	93809.06148	270819	288692
43	93798.98144	270577	288465
42	93788.89346	270335	288238
41	93778.79754	270094	288011
40	93768.69369	269853	287785
39	93758.58290	269612	287560
38	93748.46218	269371	287334
37	93738.33453	269131	287109
36	93728.19894	268892	286885
35	93718.05543	268653	286661
34	93707.90390	268414	286437
33	93697.74461	268175	286213
32	93687.57731	267937	285990
31	93677.40208	267700	285767
30	93667.21892	267462	285545
69			

20	Sinus	Tangens	Secans
30	35020.73812	37388	106761
31	35047.98333	37422	106773
32	35075.22557	37455	106784
33	35102.46484	37488	106796
34	35129.70115	37521	106807
35	35156.93448	37554	106819
36	35184.16484	37588	106831
37	35211.39221	37621	106842
38	35238.61661	37654	106854
39	35265.83803	37687	106866
40	35293.05647	37720	106878
41	35320.27191	37754	106889
42	35347.48437	37787	106901
43	35374.69384	37820	106913
44	35401.90032	37853	106925
45	35429.10379	37887	106936
46	35456.30428	37920	106948
47	35483.50176	37953	106960
48	35510.69624	37986	106972
49	35537.88771	88020	106984
50	35565.07618	38053	106995
51	35592.26163	38086	107008
52	35619.44408	38120	107019
53	35646.62351	38153	107031
54	35673.79993	38186	107043
55	35700.97332	38220	107055
56	35728.14370	38253	107067
57	35755.31105	38286	107079
58	35782.47538	38320	107091
59	35809.63668	38353	107103
60	35836.79495	38386	107114

H	Sinus	Tangens	Secans
30	93667.21892	267462	285545
29	93657.02784	267225	285323
28	93646.82883	266989	285102
27	93636.62190	266752	284880
26	93626.40704	266516	284659
25	93616.18427	266281	284439
24	93605.95357	266046	284219
23	93595.71495	265811	283999
22	93585.46841	265576	283780
21	93575.21395	265342	283561
20	93564.95158	265109	283342
19	93554.68129	264875	283124
18	93544.40308	264642	282906
17	93534.11695	264410	282688
16	93523.82292	264177	282471
15	93513.52096	263945	282254
14	93503.21110	263714	282037
13	93492.89332	263483	281821
12	93482.56763	263252	281605
11	93472.23404	263021	281390
10	93461.89253	262791	281175
9	93451.54311	262561	280960
8	93441.18579	262332	280746
7	93430.82056	262103	280531
6	93420.44743	261874	280318
5	93410.06639	261646	280104
4	93399.67744	261417	279891
3	93389.27060	261190	279679
2	93378.87585	260963	279466
1	93368.46320	260736	279254
0	93358.04264	260509	279043
69			

2 I	Sinus	Tangens	Secans
0	35836.79495	38386	107114
1	35863.95019	38420	107126
2	35891 10239	38453	107138
3	35918.25155	38487	107150
4	35945.39768	38520	107162
5	35972.54077	38553	107174
6	35999.68081	38587	107186
7	36026.81780	38620	107199
8	36053.95175	37654	107211
9	36081.08264	38687	107223
10	36108.21049	38721	107235
11	36135.33527	38754	107247
12	36162.45700	38787	107259
13	36189.57567	38821	103271
14	36216.69128	38854	107283
15	36243.80382	38888	107295
16	36270.91330	38921	107307
17	36298.01971	38955	107320
18	36325.12304	38988	107332
19	36352.22330	39022	107344
20	36379.32049	39055	107356
21	36406.41460	39089	107368
22	36433.50563	39122	107380
23	36460.59357	39156	107393
24	36487.67843	39190	107405
25	36514.76020	39223	107417
26	36541.83888	39257	107429
27	36568.91447	39290	107442
28	36595.98697	39324	107454
29	36623.05637	39357	107466
30	36650.12267	39391	107479

	Sinus	Tangens	Secans
60	93358.04264	260509	279043
59	93347.61419	260283	278832
58	93337.17784	260057	278621
57	93326.73760	259831	278410
56	93316.28145	259606	278200
55	93305.82141	259381	277990
54	93295.35348	259156	277780
53	93284.87765	258932	277571
52	93274.39392	258708	277362
51	93263.90231	258484	277154
50	93253.40280	258261	276945
49	93242.89540	258038	276737
48	93232.38012	257815	276530
47	93221.85694	257593	276323
46	93211.32588	257371	276116
45	93200.78692	257150	275909
44	93190.24009	256928	275703
43	93179.68536	256707	275497
42	93169.12275	256487	275292
41	93158.55226	256266	275086
40	93147.97389	256046	274881
39	93137.38703	255827	274677
38	93126.79349	255608	274473
37	93116.19148	255389	274269
36	93105.58158	255170	274065
35	93094.96381	254952	273862
34	93084.33816	254734	273659
33	93073.70463	254516	273456
32	93063.06322	254299	273254
31	93052.41395	254082	273052
30	93041.75679	253865	272850
6811		D	

21	Sinus	Tangens	Secans
30	36650.12267	39391	107479
31	36677.18587	39425	107491
32	36704.24596	39458	107503
33	36731.30295	39492	107516
34	36758.35683	39526	107528
35	36785.40760	39559	107540
36	36812.45526	39593	107553
37	36839.49981	39626	107565
38	36866.54123	39660	107578
39	36893.57954	39694	107590
40	36920.61473	39727	107602
41	36947.64679	39761	107615
42	36974.67572	39795	107627
43	37001.70153	39829	107640
44	37028.72420	39862	107652
45	37055.74375	39896	107665
46	37082.76015	39930	107677
47	37109.77342	39963	107690
48	37136.78355	39997	107702
49	37163.79054	40031	107715
50	37190.79438	40065	107727
51	37217.79507	40098	107740
52	37244.79262	40132	107752
53	37271.78701	40166	107765
54	37298.77825	40200	107778
55	37325.76634	40234	107790
56	37352.75126	40267	107803
57	37379.73303	40301	107815
58	37406.71163	40335	107828
59	37433.68707	40369	107841
60	37460.65934	40403	107853

	Sinus	Tangens	Secans
30	93041.75679	253865	272850
29	93031.09177	253648	272649
28	93020.41887	253432	272448
27	93009.73810	253217	272247
26	92999.04947	253001	272047
25	92988.35296	252786	271847
24	92977.64858	252571	271645
23	92966.93634	252357	271448
22	92956.21613	252142	271249
21	92945.48826	251929	271050
20	92934.75242	251715	270851
19	92924.00871	251502	270653
18	92913.25715	251289	270455
17	92902.49772	251076	270258
16	92891.73043	250864	270061
15	92880.95528	250652	269864
14	92870.17227	250440	269667
13	92859.38141	250229	269461
12	92848.58268	250018	269275
11	92837.77610	249807	269079
10	92826.96117	247597	268884
9	92816.13938	249386	268689
8	92805.30923	249177	268494
7	92794.47123	248967	268299
6	92783.62538	248758	268105
5	92772.77168	248549	267911
4	92761.91013	248340	267718
3	92751.04074	248131	267525
2	92740.16349	247924	267332
1	92729.27839	247716	267139
0	92718.38545	247509	266947
68	D 2		

22	Sinus	Tangens	Secans
0	37460.65934	40402	107853
1	37487.62844	40436	107866
2	37514.59436	40470	107879
3	37541.55712	40504	107892
4	37568.51669	40538	107904
5	37595.47309	40572	107917
6	37622.42631	40606	107930
7	37649.37634	40640	107942
8	37676.32319	40674	107955
9	37703.26685	40707	107968
10	37730.20732	40741	107981
11	37757.14460	40775	107994
12	37784.07868	40809	108006
13	37811.00956	40843	108019
14	37837.93725	40877	108032
15	37864.86173	40911	108045
16	37891.78301	40945	108058
17	37918.70108	40679	108071
18	37945.61595	41013	108084
19	37972.52760	41047	108096
20	37999.43604	41081	108109
21	38026.34127	41115	108122
22	38053.24328	41149	108135
23	38080.14206	41183	108148
24	38107.03763	41217	108161
25	38133.92997	41251	108174
26	38160.81909	41285	108187
27	38187.70497	41319	108200
28	39214.58763	41353	108213
29	38241.46705	41387	108226
30	38268.34323	41421	108239

	Sinus	Tangens	Secans
60	92718.38545	247508	266947
59	92707.48467	247302	266755
58	92696.57603	247095	266563
57	92685.65956	246888	266371
56	92674.73524	246682	266180
55	92663.80308	246476	265989
54	92652.86308	246270	265799
53	92641.91524	246065	265609
52	92630.95956	245860	265419
51	92619.99605	245655	265229
50	92609.02469	245451	265040
49	92598.04550	245246	264851
48	92587.05848	245043	264662
47	92576.06362	244839	264473
46	92565.06092	244636	264285
45	92554.05040	244433	264097
44	92543.03204	244230	263909
43	92532.00585	244027	263722
42	92520.97183	243825	263535
41	92509.92999	243623	263348
40	92498.88031	243422	263162
39	92487.82281	243220	262976
38	92476.75748	243019	262790
37	92465.68433	242819	262604
36	92454.60336	242618	262419
35	92443.51456	242418	262234
34	92432.41794	242218	262049
33	92421.31349	242018	261864
32	92410.20123	241819	261680
31	92399.08115	241620	261496
30	92387.95325	241421	261313
67	D 3		

22	Sinus	Tangens	Secans
30	38268.34323	41421	108239
31	38295.21618	41455	108252
32	38322.08588	41490	108265
33	38348.95235	41524	108278
34	38375.81557	41558	108291
35	38402.67554	41592	108305
36	38429.53226	41626	108318
37	38456.38573	41660	108331
38	38483.23595	41694	108344
39	38510.08291	41728	108357
40	38536.92661	41763	108370
41	38563.76705	41797	108383
42	38590.60423	41831	108397
43	38617.43814	41865	108410
44	38644.26878	41899	108423
45	38671.09616	41933	108436
46	38697.92026	41968	108449
47	38724.74109	42002	108463
48	38751.55864	42036	108476
49	38778.37291	42070	108489
50	38805.18390	42105	108503
51	38831.99161	42139	108516
52	38858.79603	42173	108529
53	38885.59717	42207	108542
54	38912.39501	42242	108556
55	38939.18956	42276	108569
56	38965.98082	42310	108582
57	38992.76877	42345	108596
58	39019.55343	42379	108609
59	39046.33479	42413	108623
60	39073.11284	42447	108636

	Sinus	Tangens	Secans
30	92387.95325	241421	26131
29	92376.81753	241123	26112
28	92365.67399	241025	26094
27	92354.52264	240827	26076
26	92343.36348	240629	26058
25	92332.19650	240432	26039
24	92321.02171	240235	26021
23	92309.83910	240038	26003
22	92298.64869	239841	25985
21	92287.45046	239645	25967
20	92276.24443	239449	25949
19	92265.03059	239253	25931
18	92253.80894	239058	25913
17	92242.57949	238862	25895
16	92231.34223	238668	25877
15	92220.09716	238473	25859
14	92208.84429	238279	25841
13	92197.58362	238084	25823
12	92186.31515	237891	25805
11	92175.03888	237697	25787
10	92163.75481	237504	25769
9	92152.46294	237311	25752
8	92141.16327	237118	25734
7	92129.85581	236925	25716
6	92118.54055	236733	25698
5	92107.21750	236541	25681
4	92095.88665	236349	25663
3	92084.54801	236158	25645
2	92073.20158	235967	25628
1	92061.84735	235776	25610
0	92050.48534	235585	25593
67	D 4		

23	Sinus	Tangens	Secans
0	39073.11284	42447	108636
1	39099.88759	42482	108649
2	39126.65903	42516	108663
3	39153.42716	42550	108676
4	39180.19197	42585	108690
5	39206.95347	42619	108703
6	39233.71166	42654	108717
7	39260.46652	42688	108730
8	39287.21806	42722	108744
9	39313.96627	42757	108757
10	39340.71116	42791	108771
11	39367.45272	42826	108784
12	39394.19095	42860	108798
13	39420.92585	42894	108811
14	39447.65741	42929	108825
15	39474.38563	42963	108839
16	39501.11052	42998	108852
17	39527.83206	43032	108866
18	39554.55025	43067	108880
19	39581.26510	43101	108893
20	39607.97660	43136	108907
21	39634.68475	43170	108920
22	39661.38954	43205	108934
23	39688.09098	43239	108948
24	39714.78906	43274	108962
25	39741.483378	43308	108975
26	39768.17513	43343	108989
27	39794.86513	43378	109003
28	39821.55475	43412	109017
29	39848.24900	43447	109030
30	39874.90689	43481	109044

	Sinus	Tangens	Secans
60	92050.48534	235585	255930
59	92039.11554	235395	255755
58	92027.73795	235205	255580
57	92016.35257	235015	255405
56	92004.95941	234825	255231
55	91993.55846	234636	255057
54	91982.14973	234447	254883
53	91970.73321	234258	254709
52	91959.30891	234069	254536
51	91947.87684	233881	254363
50	91936.43698	233693	254190
49	91924.98934	233505	254017
48	91913.53392	233317	253845
47	91902.07073	233130	253672
46	91890.59976	232943	253500
45	91879.12101	232756	253329
44	91867.63449	232570	253157
43	91856.14020	232383	252986
42	91844.63813	232197	252815
41	91833.12829	232012	252645
40	91821.61068	231826	252474
39	91810.08531	231641	252304
38	91798.55216	231456	252134
37	91787.01124	231271	251965
36	91775.46256	231086	251795
35	91763.90612	230902	251626
34	91752.34191	230718	251457
33	91740.76993	230534	251289
32	91729.19019	230351	251120
31	91717.60269	230167	250952
30	91706.06743	229984	250784
66	D 5		

23	Sinus	Tangens	Secans
30	39874.90689	43481	109044
31	39901.58140	43516	109058
32	39928.25253	43550	109072
33	39954.92028	43585	109086
34	39981.58466	43620	109099
35	40008.24565	43654	109113
36	40034.90325	43689	109127
37	40061.55747	43724	109141
38	40088.20830	43758	109155
39	40114.85573	43793	109169
40	40141.49977	43828	109183
41	40168.14042	43862	109197
42	40194.77766	43897	109211
43	40221.41150	43932	109224
44	40248.04195	43966	109238
45	40274.66898	44001	109252
46	40301.29261	44036	109266
47	40327.91283	44071	109280
48	40354.52963	44105	109294
49	40381.14302	44140	109308
50	40407.75299	44175	109322
51	40434.35955	44210	109337
52	40460.96268	44244	109351
53	40487.56239	44279	109365
54	40514.15867	44314	109379
55	40540.75153	44349	109393
56	40567.34095	44384	109407
57	40593.92094	44418	109421
58	40620.50950	44453	109435
59	40647.08862	44488	109449
60	40673.66430	44523	109464

	Sinus	Tangens	Secans.
30	91706.00743	229984	250784
29	91694.40441	229801	250617
28	91682.79363	229619	250449
27	91671.17510	229437	250282
26	91659.54880	229254	250115
25	91647.91476	229073	249948
24	91636.27295	228891	249782
23	91624.62339	228710	249616
22	91612.96608	228528	249450
21	91601.30102	228348	249284
20	91589.62821	228167	249119
19	91577.94764	227987	248954
18	91566.25933	227806	248789
17	91554.56327	227626	248624
16	91542.85946	227447	248459
15	91531.14791	227267	248295
14	91519.42861	227088	248131
13	91507.70157	226909	247967
12	91495.96678	226730	247804
11	91484.22425	226552	247640
10	91472.47398	226374	247477
9	91460.71597	226196	247314
8	91448.95023	226018	247152
7	91437.17674	225840	246989
6	91425.39552	225663	246827
5	91413.60656	225486	246665
4	91401.80987	225309	246504
3	91390.00544	225132	246342
2	91378.19328	224956	246181
1	91366.37238	224780	246020
0	91354.54576	224604	245859
66		D 6	

24	Sinus	Tangens	Secans
0	40673.66430	44523	109463
1	40700.23654	44558	109478
2	40726.80534	44595	109492
3	40753.37069	44627	109506
4	40779.93259	44662	109520
5	40806.49104	44697	109535
6	40833.04603	44732	109549
7	40859.59758	44767	109563
8	40886.14566	44802	109577
9	40912.69028	44837	109592
10	40939.23145	44872	109606
11	40965.76915	44907	109620
12	40992.30338	44942	109635
13	41018.83414	44977	109649
14	41045.36144	45012	109663
15	41071.88526	45047	109678
16	41098.40560	45082	109692
17	41124.92247	44117	109706
18	41151.43586	45152	109721
19	41177.94576	45187	109735
20	41204.45218	45222	109750
21	41230.95512	45257	109764
22	41257.45456	45292	109778
23	41283.95052	45327	109793
24	41310.44298	45362	109808
25	41336.93194	45397	109822
26	41363.41741	45432	109837
27	41389.89938	45467	109851
28	41416.37784	45502	109866
29	41442.85281	45537	109880
30	41469.32426	45573	109895

	Sinus	Tangens	Secans
60	91354.54576	224604	245859
59	91342.71041	224428	245699
58	91330.86732	224252	245539
57	91319.01651	224077	245378
56	91307.15797	223902	245219
55	91295.29171	223727	245059
54	91283.41772	223553	244900
53	91271.53600	223378	244741
52	91259.64657	223204	244582
51	91247.74941	223030	244423
50	91235.84453	222857	244264
49	91223.93193	222683	244106
48	91212.01161	222510	243948
47	91200.08358	222337	243790
46	91188.14782	222164	243633
45	91176.20435	222992	243476
44	91164.25317	221819	243318
43	91152.29427	221647	243162
42	91140.32766	221475	243005
41	91128.35334	221304	242848
40	91116.37130	221132	242692
39	91104.38156	220961	242536
38	91092.38410	220790	242380
37	91080.37894	220619	242225
36	91068.36608	220449	242070
35	91056.34550	220278	241914
34	91044.31722	220108	241760
33	91032.28324	219938	241605
32	91020.23756	219769	241450
31	91008.18617	219599	241296
30	90996.12708	219430	241142
65			

24	Sinus	Tangens	Secans
30	41469.32426	45572	109895
31	41495.79221	45608	109909
32	41522.25664	45643	109924
33	41548.71756	45678	109939
34	41575.17497	45713	109953
35	41601.62885	45748	109968
36	41628.07922	45784	109982
37	41654.52607	45819	109997
38	41680.96939	45854	110012
39	41707.40918	45889	110026
40	41733.84544	45924	110041
41	41760.27818	45960	110056
42	41786.70738	45995	110071
43	41813.13304	46030	110085
44	41839.55516	46065	110100
45	41865.97374	46101	110115
46	41892.38879	46136	110130
47	41918.80029	46171	110144
48	41945.20824	46206	110159
49	41971.61264	46242	110174
50	41998.01349	46277	110189
51	42024.41079	46312	110204
52	42050.80453	46348	110218
53	42077.19471	46383	110233
54	42103.58133	46418	110248
55	42129.96439	46454	110263
56	42156.34389	46489	110278
57	42182.71921	46525	110293
58	42209.09217	46560	110308
59	42235.46096	46595	110323
60	42261.82617	46631	110338

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	90996.12708	219430	241142
29	90984.06030	219261	240938
28	90971.98581	219092	240835
27	90959.90363	218923	240681
26	90947.81375	218755	240528
25	90935.71617	218587	240375
24	90923.61090	218419	240222
23	90911.43794	218251	240070
22	90899.37728	218084	239918
21	90887.24893	217916	239766
20	90875.11289	217749	239614
19	90862.96916	217582	239462
18	90850.81775	217416	239311
17	90838.65864	217249	239159
16	90826.49185	217083	239008
15	90814.31738	216917	238857
14	90802.13522	216751	238707
13	90789.94537	216585	238556
12	90777.74785	216420	238406
11	90765.54264	216255	238256
10	90753.32975	216090	238106
9	90741.10919	215925	237957
8	90728.88094	215760	237808
7	90716.64502	215596	237658
6	90704.40142	215432	237509
5	90692.15015	215268	237361
4	90679.89120	215104	237212
3	90667.62459	214940	237064
2	90655.35029	214777	236916
1	90643.06833	214614	236768
0	90630.77870	214451	236620

6511

25	Sinus	Tangens	Secans
0	42261.82617	46630	110338
1	42288.18781	46666	110353
2	42314.54586	46702	110368
3	42340.90034	46737	110383
4	42367.25124	46772	110398
5	42393.59851	46808	110413
6	42419.94227	46843	110428
7	42446.28240	46879	110443
8	42472.61894	46914	110458
9	42498.95189	46950	110473
10	42525.28124	46985	110488
11	42551.60700	47021	110503
12	42577.92915	47056	110518
13	42604.24770	47092	110533
14	42630.56265	47128	110548
15	42656.87399	47163	110564
16	42683.18171	47199	110579
17	42709.48583	47234	110594
18	42735.78633	47270	110609
19	42762.08322	47305	110625
20	42788.37649	47341	110640
21	42814.66614	47377	110655
22	42840.95216	47412	110670
23	42867.23456	47448	110686
24	42893.51334	47483	110701
25	42919.78848	47519	110716
26	42946.05999	47555	110731
27	42972.32787	47590	110747
28	42998.59211	47626	110762
29	43024.85271	47662	110777
30	43051.10968	47698	110793

	Sinus	Tangens	Secans
60	90630.77870	214451	236620
59	90618.48140	214288	236473
58	90606.17643	214125	236325
57	90593.86379	213963	236178
56	90581.54349	213801	236031
55	90569.21553	213639	235885
54	90556.87990	213477	235738
53	90544.53660	213316	235592
52	90532.18565	213154	235446
51	90519.82704	212993	235300
50	90507.46076	212832	235154
49	90495.08683	212671	235009
48	90482.70524	212511	234863
47	90470.31600	212350	234718
46	90457.91910	212190	234573
45	90445.51454	212030	234429
44	90433.10233	211871	234284
43	90420.68247	211711	234140
42	90408.25496	211552	233996
41	90395.81980	211392	233852
40	90383.37699	211233	233708
39	90370.92613	211075	233565
38	90358.46843	210916	233422
37	90346.00268	210758	233278
36	90333.52928	210600	233135
35	90321.04824	210441	232993
34	90308.55956	210284	232850
33	90296.06324	210126	232708
32	90283.55927	209969	233566
31	90271.04767	209811	232424
30	90258.52843	209654	232282
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25	Sinus	Tangens	Secans
30	43051.10968	47698	110793
31	43077.36300	47733	110808
32	43103.61267	47769	110824
33	43129.85870	47805	110839
34	43156.10108	47840	110854
35	43182.33980	47876	110870
36	43208.57488	47912	110885
37	43234.80629	47948	110901
38	43261.03405	47984	110916
39	43287.25815	48019	110932
40	43313.47858	48055	110947
41	43339.69535	48091	110963
42	43365.90845	48127	110978
43	43392.11789	48163	110994
44	43418.32365	48198	111009
45	43444.52574	48234	111025
46	43470.72415	48270	111041
47	43496.91888	48306	111056
48	43523.10993	48342	111072
49	43549.29730	48378	111087
50	43575.48099	48414	111103
51	43601.66098	48450	111119
52	43627.83729	48486	111134
53	43654.00991	48521	111150
54	43680.17883	48557	111166
55	43706.34406	48593	111181
56	43732.50559	48629	111197
57	43758.66341	48665	111213
58	43784.81754	48701	111229
59	43810.96796	48737	111244
60	43837.11467	48773	111260

	<i>Sinus-</i>	<i>Tangens</i>	<i>Secans</i>
30	90258.52843	209654	232282
29	90246.00155	209498	232140
28	90233.46704	209341	231999
27	90220.92489	209184	231858
26	92208.37510	209028	231717
25	90195.81768	208872	231576
24	90183.25264	208716	231436
23	90170.67996	208560	231295
22	90158.09965	208405	231155
21	90145.51171	208250	231015
20	90132.91614	208094	230875
19	90120.31295	207939	230735
18	90107.70213	207785	230596
17	90095.08368	207630	230457
16	90082.45762	207476	230317
15	90069.82293	207321	230179
14	90057.18262	207167	230040
13	90044.53369	207014	229901
12	90031.87714	206860	229763
11	90019.21297	206706	229625
10	90006.54118	206553	229487
9	89993.86178	206400	229349
8	89981.17476	206247	229211
7	89968.48013	206094	229074
6	89955.77789	205942	228937
5	89943.06804	205789	228800
4	89930.35057	205637	228663
3	89917.62510	205485	228526
2	89904.89281	205333	228390
1	89892.15252	205182	228253
0	89879.40462	205030	228117

26	Sinus	Tangens	Secans
0	43837.11467	48773	111260
1	43863.25768	48809	111276
2	43889.39697	48845	111292
3	43915.53255	48881	111308
4	43941.66441	48917	111323
5	43967.79256	48953	111339
6	43993.91698	48989	111355
7	44020.03768	49026	111371
8	44046.15466	49062	111387
9	44072.26791	49098	111403
10	44098.37743	49134	111419
11	44124.48322	49170	111435
12	44150.58527	49206	111451
13	44176.68359	49242	111467
14	44202.77818	49278	111483
15	44228.86902	49315	111499
16	44254.95612	49351	111515
17	44281.03947	49387	111531
18	44307.11908	49423	111547
19	44333.19494	49459	111563
20	44359.26704	49495	111579
21	44385.33540	49532	111595
22	44411.39999	49568	111611
23	44437.46083	49604	111627
24	44463.51791	49640	111643
25	44489.57123	49677	111659
26	44515.62078	49713	111675
27	44541.66657	49749	111691
28	44567.70859	49786	111708
29	44593.74683	49822	111724
30	44619.78131	49858	111740

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	89879.40462	205030	228117
59	89866.64912	204879	227981
58	89853.88602	204728	227845
57	89841.11531	204577	227710
56	89828.33700	204426	227574
55	89815.55108	204276	227439
54	89802.75757	204125	227304
53	89789.95646	203975	227169
52	89777.14775	203825	227035
51	89764.33145	203675	226900
50	89751.50755	203526	226766
49	89738.57605	203376	226632
48	89725.83696	203227	226498
47	89712.99028	203078	226364
46	89700.13601	202929	226230
45	89687.27415	202780	226097
44	89674.40470	202631	225963
43	89661.52766	202483	225830
42	89648.64303	202335	225697
41	89635.75082	202187	225565
40	89622.85103	202039	225432
39	89609.94365	201891	225300
38	89597.02869	201743	225167
37	89584.10614	201596	225035
36	89571.17602	201449	224903
35	89558.23832	201302	224772
34	89545.29304	201155	224640
33	89532.34018	201008	224509
32	89519.37975	200862	224378
31	89506.41174	200715	224247
30	89493.40616	200569	224116

26	Sinus	Tangens	Secans
30	44619.78131	49858	111740
31	44645.81200	49894	111756
32	44671.83892	49931	111772
33	44697.86206	49967	111789
34	44723.88142	50004	111705
35	44749.89699	50040	111821
36	44775.90878	50079	111838
37	44801.91678	50113	111854
38	44827.92098	50149	111870
39	44853.92140	50185	111886
40	44879.91802	50222	111903
41	44905.91084	50258	111919
42	44931.89986	50295	111936
43	44957.88508	50331	111952
44	44983.86649	50368	111968
45	45009.84410	50404	111985
46	45035.81790	50441	112001
47	45061.78789	50477	112018
48	45087.75406	50514	112034
49	45113.71642	50550	112051
50	45139.67497	50587	112067
51	45165.62969	50623	112083
52	45191.58060	50660	112100
53	45217.52767	50696	112117
54	45243.47093	50733	112133
55	45269.41035	50769	112150
56	45295.34594	50806	112166
57	45321.27770	50843	112183
58	45347.20563	40879	112199
59	45373.12972	50916	112216
60	45399.04997	50953	112233

	Sinus	Tangens	Secans
30	89493.43616	200569	224116
29	89480.45300	200423	223985
28	89467.46228	200277	223855
27	89454.46398	200131	223724
26	89441.45811	199986	223594
25	89428.44468	199841	223464
24	89415.42368	199695	223334
23	89402.39511	199550	223205
22	89389.35898	199406	223075
21	89245.46257	199261	222946
20	89363.26403	199116	222817
19	89350.20521	198972	222688
18	89337.13883	198828	222559
17	89324.06489	198684	222430
16	89310.98339	198540	222302
15	89297.89434	198396	222174
14	89284.79773	198253	222045
13	89271.69356	198110	221918
12	89271.69356	197966	221790
11	89258.58184	197823	221662
10	89232.33574	197680	221535
9	89219.20137	197538	221407
8	89206.05945	197395	221280
7	89192.90997	197253	221153
6	89179.75296	197111	221026
5	89166.58839	196969	220900
4	89153.41628	196827	220773
3	89140.23663	196685	220647
2	89127.04243	196544	220521
1	89113.85469	196402	220395
0	89100.65241	196261	220269

27	Sinus	Tangens	Secans
0	45399.04997	50953	112233
1	45424.96638	50989	112249
2	45450.87894	51026	112266
3	45476.78766	51063	112283
4	45502.69253	51099	112299
5	45528.59355	51136	112316
6	45554.49072	51173	112333
7	45580.38403	51209	112349
8	45606.27349	51246	112366
9	45632.15909	51283	112383
10	45658.04082	51319	112400
11	45683.91869	51356	112416
12	45709.79270	51393	112433
13	45735.66284	51430	112450
14	45761.52911	51467	112467
15	45787.39151	51503	112484
16	45813.25003	51540	112501
17	45839.10468	51577	112517
18	45864.95544	51614	112534
19	45890.80233	51651	112551
20	45916.64533	51688	112568
21	45942.48445	51724	112585
22	45968.31968	51761	112602
23	45994.15102	51798	112619
24	46019.97847	51835	112636
25	46045.80203	51872	112653
26	46071.62169	51909	112670
27	46097.43745	51946	112687
28	46123.24931	51983	112704
29	46149.05727	52020	112721
30	46174.86132	52057	112738

	Sinus	Tangens	Secans
60	89100.65241	196261	220269
59	89087.44260	196120	220143
58	89074.25524	195979	220018
57	89061.00035	195838	219892
56	89047.76792	195698	219767
55	89034.52795	195597	219642
54	89021.28046	195417	219517
53	89008.02543	195277	219393
52	88994.76286	195137	219268
51	88981.49277	194998	219144
50	88968.21515	194858	219019
49	88954.93000	194718	218895
48	88941.63732	194579	218771
47	88928.33712	194440	218648
46	88915.02939	194301	218524
45	88901.71414	194162	218401
44	88888.39137	194023	218277
43	88875.06108	193885	218154
42	88861.72326	193746	218031
41	88848.37793	193608	217909
40	88835.02507	193470	217786
39	88821.66471	193332	217663
38	88808.29682	193195	217541
37	88794.92142	193057	217419
36	88781.53851	192920	217297
35	88768.14808	192782	217175
34	88754.75015	192645	217053
33	88741.34470	192508	216932
32	88727.93175	192371	216810
31	88714.51128	192235	216689
30	88701.08331	192098	216568
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27	Sinus	Tangens	Secans
30	46174.86132	52057	112738
31	46200.66146	52094	112755
32	46226.45770	52131	112772
33	46252.25002	52168	112789
34	46278.03844	52205	112807
35	46303.82293	52242	112824
36	46329.60351	52279	112841
37	46355.38016	52316	112858
38	46381.15290	52353	112875
39	46406.92171	52390	112892
40	46432.68659	52427	112910
41	46458.44754	52464	112927
42	46484.20457	52501	112944
43	46509.95766	52538	112961
44	46535.70681	52575	112979
45	46561.45203	52613	112996
46	46587.19330	52650	113013
47	46612.93064	52687	113031
48	46638.66403	52724	113048
49	46664.39347	52761	113065
50	46690.11897	52798	113083
51	46715.84051	52836	113100
52	46741.55810	52873	113117
53	46767.27174	52910	113135
54	46792.98142	52947	113152
55	46818.68714	52985	113170
56	46844.38890	53022	113187
57	46870.08669	53059	113205
58	46895.78052	53096	113222
59	46921.47038	53134	113239
60	46947.15627	53171	113257

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	88701.08331	192098	216568
29	88687.64784	191962	216447
28	88674.20486	191826	216326
27	88660.75437	191690	216206
26	88647.29639	191554	216085
25	88633.83090	191418	215965
24	88620.35792	191282	215845
23	88606.87743	191147	215725
22	88593.38945	191012	215605
21	88579.89397	190876	215485
20	88566.39100	190741	215366
19	88552.88053	190607	215246
18	88539.36257	190472	215127
17	88525.83712	190337	215008
16	88512.30417	190203	214889
15	88498.76374	190069	214770
14	88485.21582	189935	214651
13	88471.66041	189801	214533
12	88458.09752	189667	214414
11	88444.52714	189533	214296
10	88430.94927	189400	214178
9	88417.36393	189266	214060
8	88403.77110	189133	213942
7	88390.17079	189000	213825
6	88376.56300	188867	213707
5	88362.94774	188734	213590
4	88349.32500	188602	213473
3	88335.69478	188469	213356
2	88322.05709	188337	213239
1	88308.41192	188205	213122
0	88294.75928	188073	213005

28	Sinus	Tangens	Secans
0	46947.15627	53171	113257
1	46972.83819	53208	113275
2	46998.51613	53246	113292
3	47024.19010	53283	113310
4	47049.86009	53320	113327
5	47075.52609	53358	113345
6	47101.18812	53395	113362
7	47126.84615	53432	113380
8	47152.50020	53470	113398
9	47178.15026	53507	113415
10	47203.79633	53545	113433
11	47229.43840	53582	113451
12	47255.07648	53620	113468
13	47280.71056	53657	113486
14	47306.34064	53694	113504
15	47331.96671	53732	113521
16	47357.58878	53769	113539
17	47383.20685	53807	113557
18	47408.82090	53844	113575
19	47434.43094	53882	113593
20	47460.03697	53920	113610
21	47485.63898	53957	113628
22	47511.23698	53995	113646
23	47536.83090	54032	113664
24	47562.42090	54070	113682
25	47588.00683	54107	113700
26	47613.58873	54145	113718
27	47639.16660	54183	113735
28	47664.74044	54220	113753
29	47690.31025	54258	113771
30	47715.87602	54296	113789

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	88294.75928	188072	213005
59	88281.09917	187941	212889
58	88267.43159	187809	212773
57	88253.75654	187677	212657
56	88240.07407	187546	212540
55	88226.38404	187415	212425
54	88212.68660	187283	212309
53	88198.98168	187152	212193
52	88185.26931	187021	212078
51	88171.54947	186891	211963
50	88157.82217	186760	211847
49	88144.08742	186630	211732
48	88130.34520	186499	211617
47	88116.59533	186369	211503
46	88102.83840	186239	211388
45	88089.07381	186109	211274
44	88075.30178	185979	211159
43	88061.52229	185850	211045
42	88047.73535	185720	210931
41	88033.94095	185591	210817
40	88020.13911	185462	210704
39	88006.32982	185333	210590
38	87992.51309	185204	210477
37	87978.68891	185075	210363
36	87964.85728	184946	210250
35	87951.01821	184818	210137
34	87937.17170	184689	210024
33	87923.31775	184561	209911
32	87909.45636	184433	209799
31	87995.58753	184305	209686
30	87881.71126	184177	209574
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28	Sinus	Tangens	Secans
30	47715.87602	54296	113789
31	47741.43776	54333	113807
32	47766.99545	54371	113825
33	47792.54910	54409	113843
34	47818.09871	54446	113861
35	47843.64427	54484	113879
36	47869.18579	54522	113897
37	47894.72325	54560	113915
38	47920.25666	54597	113934
39	47945.78602	54635	113952
40	47971.31132	54673	113970
41	47996.83256	54711	113988
42	48022.34976	54748	114006
43	48047.86285	54786	114024
44	48073.37199	54824	114042
45	48098.87689	54862	114061
46	48124.37780	54900	114079
47	48149.87464	54938	114097
48	48175.36741	54975	114115
49	48200.85609	55013	114134
50	48226.34071	55051	114152
51	48251.82124	55089	114170
52	48277.29768	55127	114188
53	48302.77005	55165	114207
54	48328.23832	55203	114225
55	48353.70251	55241	114243
56	48379.16260	55279	114262
57	48404.61860	55317	114280
58	48430.07051	55355	114299
59	48455.51831	55393	114317
60	48480.96202	55431	114335

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	87881.71126	184177	209573
29	87867.82756	184049	209462
28	87853.93642	183922	209350
27	87840.03785	183794	209238
26	87826.13184	183667	209126
25	87812.21840	183540	209014
24	87798.29754	184313	208903
23	87784.36924	183286	208791
22	87770.43352	183159	208680
21	87756.49037	183033	208569
20	87742.53979	182906	208458
19	87728.58179	182780	208347
18	87714.61637	182654	208236
17	87700.64352	182528	208126
16	87686.66325	182402	208015
15	87672.67557	182276	207905
14	87658.68046	182150	207795
13	87644.67794	182025	207685
12	87630.66800	181899	207575
11	87616.65065	181774	207465
10	87602.62588	181649	207356
9	87588.59370	181524	207246
8	87574.55411	181399	207137
7	87560.50711	181274	207027
6	87546.45270	181150	206918
5	87532.39088	181025	206809
4	87518.32165	180901	206701
3	87504.24502	180777	206592
2	87490.16099	180653	206483
1	87476.06955	180529	206375
0	87462.97071	180405	206267

29	Sinus	Tangens	Secans
0	48480.96202	55430	114335
1	48506.40162	55469	114354
2	48531.83712	55507	114372
3	48557.26852	55545	114391
4	48582.69580	55583	114409
5	48608.11898	55621	114428
6	48633.53804	55659	114446
7	48658.95298	55697	114465
8	48684.36381	55736	114483
9	48709.77052	55774	114502
10	48735.17311	55812	114521
11	48760.57157	55850	114539
12	48785.96591	55888	114558
13	48811.35612	55926	114576
14	48836.74229	55964	114595
15	48862.12414	56003	114614
16	48887.50196	56041	114632
17	48912.87563	56079	114651
18	48938.24517	56117	114670
19	48963.61057	56156	114689
20	48988.97182	56194	114707
21	49014.32893	56232	114726
22	49039.68189	56270	114745
23	49065.03070	56309	114764
24	49090.37536	56347	114782
25	49115.71586	56385	114801
26	49141.05221	56424	114820
27	49166.38440	56462	114839
28	49191.71243	56500	114858
29	49217.03630	56539	114877
30	49242.35601	56577	114896
			113

	Sinus	Tangens	Secans.
60	87461.97071	180404	206267
59	87447.86447	180281	206158
58	87433.75083	180158	206050
57	87419.62979	180034	205942
56	87405.50136	179911	205835
55	87391.36552	179788	205727
54	87377.22230	179665	205619
53	87363.07168	179542	205512
52	87348.91367	179416	205405
51	87334.74826	179296	205298
50	87320.57547	179174	205191
49	87306.39529	179051	205084
48	87292.20772	178929	204977
47	87278.01277	178807	204870
46	87263.81043	178685	204764
45	87249.60070	178563	204657
44	87235.38360	178441	204551
43	87221.15911	178319	204445
42	87206.92724	178198	204339
41	87192.68799	178077	204233
40	87178.44136	177955	204128
39	87164.18736	177834	204022
38	87149.92598	177713	203916
37	87135.65723	177592	203811
36	87121.38111	177471	203706
35	87107.09761	177351	203601
34	87092.80674	177230	203496
33	87078.50851	177110	203391
32	87064.20290	176990	003286
31	87049.88993	176869	203182
30	87035.56959	176749	203077
50	E 5		

29	Sinus	Tangens	Secans
30	49242.35601	56577	114896
31	49267.67154	56616	114914
32	49292.98291	56654	114933
33	49318.29011	56693	114952
34	49343.59313	56731	114971
35	49368.89198	56769	114990
36	49394.18665	56808	115009
37	49419.47715	56846	115028
38	49444.76346	56885	115047
39	49470.04558	56923	115066
40	49495.32352	56962	115085
41	49520.59728	57000	115105
42	49545.86684	57039	115124
43	49571.13221	57078	115143
44	49596.39338	57116	115162
45	49621.65036	57155	115181
46	49646.90314	57193	115200
47	49672.15172	57232	115219
48	49697.39610	57271	115238
49	49722.63627	57309	115258
50	49747.87223	57348	115277
51	49773.10399	57386	115296
52	49898.33153	57425	115315
53	49823.55486	57464	115335
54	49848.77397	57503	115354
55	49873.98887	57541	115373
56	49899.19954	57580	115393
57	49924.40599	57619	115412
58	49949.60822	57657	115431
59	49974.80622	57696	115451
60	50000.00000	57735	115470

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	87035.56959	176749	203077
29	87021.24189	176629	202973
28	87006.90682	176510	202869
27	86992.56439	176390	202765
26	86978.21460	176271	202661
25	86963.85745	176151	202557
24	86949.49295	176032	202453
23	86935.12108	175913	202349
22	86920.74186	175794	202246
21	86906.35528	175675	202143
20	86891.96135	175556	202039
19	86877.56007	175437	201936
18	86863.15144	175319	201833
17	86848.73546	175200	201730
16	86834.31212	175082	201628
15	86819.88144	174964	201525
14	86805.44342	174846	201422
13	86790.99805	174728	201320
12	86776.54533	174610	201218
11	86762.08527	174492	201116
10	86747.61788	174375	201014
9	86733.14314	174257	200912
8	86718.66106	174140	200810
7	86704.17164	174022	200708
6	86689.67489	173905	200607
5	86675.17080	173788	200505
4	86660.65938	173671	200404
3	86646.14062	173555	200303
2	86635.61454	173438	000202
1	86617.08112	173321	200101
0	86602.54037	173205	200000
60	E 6		

30.	Sinus	Tangens	Secans
0	50000.00000	57735	115470
1	50025.18954	57774	115489
2	50050.37485	57813	115509
3	50075.55592	57851	115528
4	50100.73276	57890	115548
5	50125.90535	57929	115567
6	50151.07371	57968	115587
7	50176.23782	58007	115606
8	50201.39769	58046	115626
9	50226.55331	58085	115645
10	50251.70468	58124	115665
11	50276.85180	58162	115684
12	50301.99466	58201	115704
13	50327.13326	58240	115724
14	50352.26761	58279	115743
15	50377.39770	58318	115763
16	50402.52352	58357	115782
17	50427.64508	58396	115802
18	50452.76238	58435	115822
19	50477.87540	58474	115841
20	50502.98415	58513	115861
21	50528.08863	58552	115881
22	50553.18884	58591	115901
23	50578.28476	58631	115920
24	50603.37641	58670	115940
25	50628.46377	58709	115960
26	50653.54685	58748	115980
27	50678.62565	58787	116000
28	50703.70015	58826	116019
29	50728.77037	58865	116039
30	50753.83629	58905	116059

	Sinus	Tangens	Secans
60	86602.54037	173205	200000
59	86587.99230	173089	199890
58	86573.43690	172973	199790
57	86558.87417	172857	199690
56	86544.30412	172741	199590
55	86529.72675	172625	199490
54	86515.14205	172509	199390
53	86500.55004	172393	199290
52	86485.95070	172278	199190
51	86471.34405	172163	199090
50	86456.73008	172047	198990
49	86442.10879	171932	198890
48	86427.48079	171817	198790
47	86412.84428	171702	198700
46	86398.20105	171588	198600
45	86383.55052	171473	198500
44	86368.89267	171358	198400
43	86354.22752	171244	198300
42	86339.55506	171129	198200
41	86324.87529	171015	198100
40	86310.18822	170901	198000
39	86295.49384	170787	197910
38	86280.79217	170673	197810
37	86266.08319	170560	197713
36	86251.36692	170446	197615
35	86236.64334	170332	197517
34	86221.91247	170219	197420
33	86207.17430	170106	197322
32	86192.42884	169992	197224
31	86177.67609	169879	197127
30	86162.91604	169766	197029
59			

30	Sinus	Tangens	Secans
30	50753.83629	58904	116059
31	50778.89792	58944	116079
32	50803.95525	58983	116099
33	50829.00828	59022	116119
34	50854.05702	59061	116139
35	50879.10145	59101	116159
36	50904.14157	59140	116179
37	50929.17739	59179	116199
38	50954.20889	59218	116219
39	50979.23609	59258	116239
40	51004.25897	59297	116259
41	51029.27754	59336	116279
42	51054.29179	59396	116299
43	51079.30171	59415	116319
44	51104.30732	59454	116339
45	51129.30860	59494	116359
46	51154.30556	59533	116380
47	51179.29819	59573	116400
48	51204.28648	59612	116420
49	51229.27045	59651	116440
50	51254.25007	59691	116460
51	51279.22237	59730	116481
52	51304.19632	59770	116501
53	51329.16293	59809	116521
54	51354.12520	59849	116541
55	51379.08312	59888	116562
56	51404.03670	59928	116582
57	51428.98593	59967	116602
58	51453.93080	60007	116623
59	51478.87132	60046	116643
60	51503.80749	60086	116663

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	86162.91604	169766	197029
29	86148.14870	169653	196932
28	86133.37407	169541	196835
27	86118.59216	169428	196738
26	86103.80296	169315	196641
25	86089.00647	169203	196544
24	86074.20270	169091	196448
23	86059.39164	168979	196351
22	86044.57330	168866	196255
21	86029.74768	168754	196158
20	86014.91478	168643	196062
19	86000.07461	168531	195966
18	85985.22715	168419	195870
17	85970.37243	168308	195774
16	85955.51042	168196	195678
15	85940.64115	168085	195583
14	85925.76460	167974	195487
13	85910.88078	167863	195391
12	85895.98969	167752	195296
11	85881.09133	167641	195201
10	85866.18571	167530	195106
9	85851.27282	167419	195011
8	85836.35266	167309	194916
7	85821.42525	167198	194821
6	85806.49057	167088	194726
5	85791.54863	166978	194632
4	85776.59943	166867	194537
3	85761.64297	166757	194443
2	85746.67926	166647	194349
1	85731.70829	166538	194254
0	85716.73007	166428	194160

I	Sinus	Tangens	Secans
0	51503.80749	60086	116663
1	51528.73929	60126	116684
2	51553.66674	60165	116704
3	51578.58982	60205	116725
4	51603.50854	60245	116745
5	51628.42290	60284	116766
6	51653.33288	60324	116786
7	51678.23850	60364	116806
8	51703.13974	60403	116827
9	51728.03660	60443	116848
10	51752.92909	60483	116868
11	51777.81720	60522	116889
12	51802.70093	60562	116909
13	51827.58028	60602	116930
14	51852.45524	60642	116950
15	51877.32581	60681	116971
16	51902.19199	60721	116992
17	51927.05379	60761	117012
18	51951.91118	60801	117033
19	51976.76418	60841	117054
20	52001.61279	60881	117075
21	52026.45699	60921	117095
22	52051.29679	60960	117116
23	52076.13219	61000	117137
24	52100.96318	61040	117158
25	52125.78976	61080	117178
26	52150.61193	61120	117199
27	52175.42969	61160	117220
28	52200.24303	61200	117241
29	52225.05196	61240	117262
30	52249.85647	61280	117283
11			

	Sinus	Tangens	Secans
60	85716.73007	166428	194160
59	85701.74459	166318	194066
58	85686.75186	166209	193973
57	85671.75188	166099	193879
56	85656.74465	165990	193785
55	85641.73018	165881	193692
54	85626.70846	165772	193598
53	85611.67949	165663	193505
52	85596.64328	165554	193412
51	85581.59982	165445	193319
50	85566.54912	165337	193226
49	85551.49119	165228	193133
48	85536.42601	165120	193040
47	85521.35360	165011	192947
46	85506.27395	164903	192855
45	85491.18706	164795	192762
44	85476.09294	164687	192670
43	85460.99159	164579	192578
42	85445.88301	164471	192486
41	85430.76720	164363	192395
40	85415.64415	164256	192302
39	85400.51388	164148	192210
38	85385.37639	164041	192118
37	85370.23167	163934	192027
36	85355.07972	163826	191935
35	85339.92056	163719	191844
34	85324.75417	163612	191752
33	85309.58056	163505	191661
32	85294.39973	163398	191570
31	85279.21169	163292	191479
30	85264.04643	163185	191388
581			

31	Sinus	Tangens	Secans
30	52249.85647	61280	117283
31	52274.65655	61320	117304
32	52299.45222	61360	117325
33	52324.24345	61400	117346
34	52349.03026	61440	117367
35	52373.81264	61480	117388
36	52398.59059	61520	117409
37	52423.36411	61561	117430
38	52448.13319	61601	117451
39	52472.89783	61641	117472
40	52497.65803	61681	117493
41	52522.41379	61721	117514
42	52547.16510	61761	117535
43	52571.91197	61801	117556
44	52596.65439	61842	117577
45	52621.39236	61882	117598
46	52646.12588	61922	117619
47	52670.85494	61962	117641
48	52695.57954	62003	117662
49	52720.29969	62043	117683
50	52745.01538	62083	117704
51	52769.72660	62123	117726
52	52794.43336	62164	117747
53	52819.13565	62204	117768
54	52843.83347	62245	117790
55	52868.52682	62285	117811
56	52893.21569	62325	117832
57	52917.90009	62366	117854
58	52942.58001	62406	117875
59	52967.25546	62446	117896
60	52991.92642	62487	117918

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	85264.01643	163185	191388
29	85248.81396	- 163079	191297
28	85233.60427	162972	191207
27	85218.38737	162866	191116
26	85203.16326	162760	191026
25	85187.93194	162654	190935
24	85172.69341	162548	190845
23	85157.44767	162442	190755
22	85142.19473	162336	190665
21	85126.93459	162230	190575
20	85111.66724	162125	190485
19	85096.39269	162019	190395
18	85081.11094	161914	190305
17	85065.82199	161808	190216
16	85050.52584	161703	190126
15	85035.22249	161598	190037
14	85019.91195	161493	189947
13	85004.59422	161388	189858
12	84989.26929	161283	189769
11	84973.93718	161179	189680
10	84958.59787	161074	189591
9	84943.25137	160970	189503
8	84927.89768	160865	189414
7	84912.53681	160761	189325
6	84897.16876	160657	189237
5	84881.79352	160553	189148
4	84866.41110	160449	189060
3	84851.02149	160345	188972
2	84835.62471	160241	188884
1	84820.22075	160137	188796
0	84804.80961	160033	188708
5811			

32	Sinus	Tangens	Secans
0	52991.92642	62487	117917
1	53016.59290	62527	117939
2	53041.25489	62568	117961
3	53065.91239	62608	117982
4	53090.56540	62649	118004
5	53115.21392	62689	118025
6	53139.85795	62730	118047
7	53164.49748	62770	118068
8	53189.13251	62811	118090
9	53213.76304	62852	118111
10	53238.38906	62892	118133
11	53263.01059	62933	118155
12	53287.62760	62973	118176
13	53312.24011	63014	118198
14	53336.84810	63055	118220
15	53361.45159	63095	118241
16	53386.05055	63136	118263
17	53410.64500	63177	118285
18	53435.23493	63217	118307
19	53459.82034	63258	118328
20	53484.40123	63299	118350
21	53508.97759	63340	118372
22	53533.54942	63380	118394
23	53558.11672	63421	118416
24	53582.67949	63462	118437
25	53607.23773	63503	118459
26	53631.79143	63544	118481
27	53656.34059	63584	118503
28	53680.88521	63625	118525
29	53705.42529	63666	118547
30	53729.96083	63707	118569

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	84804.88901	160033	188708
59	84789.39130	159930	188620
58	84773.96581	159826	188532
57	84758.53315	159723	188445
56	84743.09331	159620	188357
55	84727.64631	159517	188270
54	84712.19213	159414	188183
53	84696.73079	159311	188095
52	84681.26228	159208	188008
51	84665.78661	159105	187921
50	84650.30377	159002	187834
49	84634.81377	158900	187748
48	84619.31661	158797	187660
47	84603.81229	158695	187574
46	84588.30080	158593	187488
45	84572.78217	158490	187401
44	84557.25637	158388	187315
43	84541.72342	158286	187229
42	84526.18332	158184	187142
41	84510.63606	158083	187056
40	84495.08165	157981	186970
39	84479.52010	157879	186885
38	84463.95139	157778	186799
37	84448.37554	157676	186713
36	84432.79255	157575	186627
35	84417.20240	157474	186542
34	84401.60512	157372	186457
33	84386.00069	157271	186371
32	84370.38913	157170	186286
31	84354.77042	157069	186201
30	84339.14458	156969	186116

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32 || Sinus | Tangens | Secans

30	53729.96083	63707	118568
31	53754.49182	63748	118591
32	53779.01826	63789	118613
33	53803.54015	63830	118635
34	53828.05749	63871	118657
35	53852.07027	63912	118679
36	53877.07850	63953	118701
37	53901.58216	63994	118723
38	53926.08127	64035	118745
39	53950.57581	64076	118767
40	53975.06579	64117	118790
41	53999.55120	64158	118812
42	54024.03204	64199	118834
43	54048.50831	64240	118856
44	54072.98001	64281	118878
45	54097.44713	64322	118901
46	54121.90968	64363	118923
47	54146.36764	64404	118945
48	54170.82102	64446	118967
49	54195.26982	64487	118990
50	54219.71404	64528	119012
51	54244.15366	64569	119034
52	54268.58870	64610	119057
53	54293.01914	64652	119079
54	54317.44499	64693	119102
55	54341.86624	64734	119124
56	54366.28290	64775	119146
57	54390.69495	64817	119169
58	54415.10241	64858	119191
59	54439.50525	64899	119214
60	54463.90250	64941	119236

	Sinns	Tangens	Secans
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30	84339.14458	156969	186116
29	84323.51160	156868	186031
28	84307.87148	156767	185946
27	84292.22423	156667	185861
26	84276.56985	156566	185777
25	84260.90834	156466	185692
24	84245.23970	156366	185608
23	84229.56392	156265	185523
22	84213.88103	156165	185439
21	84198.19100	156065	185355
20	84182.49385	155966	185271
19	84166.78958	155866	185187
18	84151.07819	155766	185103
17	84135.35968	155666	185019
16	84119.63404	155567	184935
15	84103.90129	155467	184852
14	84088.16142	155368	184768
13	84072.41444	155269	184685
12	84056.66034	155170	184601
11	84040.89914	155071	184518
10	84025.13082	154972	184435
9	84009.35538	154873	184352
8	83993.57285	154774	184269
7	83977.78320	154675	184186
6	83961.98645	154576	184103
5	83946.18259	154478	184020
4	83930.37163	154379	183938
3	83914.55357	154281	183855
2	83898.72841	154183	183773
1	83882.89615	154085	183690
0	83867.05679	153986	183608

33	Sinus	Tangens	Secans
0	54463.90350	64941	119236
1	54488.29713	64982	119259
2	54512.68615	65023	119281
3	54537.07056	65065	119304
4	54561.45036	65106	119327
5	54585.82554	65148	119349
6	54610.19610	65189	119372
7	54634.56204	65231	119394
8	54658.92335	65272	119417
9	54683.28004	65314	119440
10	54707.63211	65355	119462
11	54731.97954	65397	119485
12	54756.32234	65438	119508
13	54780.66051	65480	119531
14	54804.99405	65521	119553
15	54829.32295	65563	119576
16	54853.64721	65604	119599
17	54877.96682	65646	119622
18	54902.28179	65688	119645
19	54926.59212	65729	119668
20	54950.89780	65771	119691
21	54975.19883	65813	119713
22	54999.49521	65854	119736
23	55023.78693	65896	119759
24	55048.07400	65938	119782
25	55072.35641	65980	119805
26	55096.63416	66021	119828
27	55120.90725	66063	119851
28	55145.17568	66105	119875
29	55169.43944	66147	119897
30	55193.69853	66189	119920

Sinus Tangens Secans

66	83867.05679	153986	183608
59	83851.21033	153889	183526
58	83835.35678	153791	183444
57	83819.49614	153693	183362
56	83803.62840	153595	183280
55	83787.75357	153497	183198

54	83771.87166	153400	183116
53	83755.98265	153302	183034
52	83740.08656	153204	182953
51	83724.18338	153107	182871
50	83708.27312	153010	182790

49	83692.35577	152913	182709
48	83676.43134	152816	182627
47	83660.49983	152719	182546
46	83644.56124	152622	182465
45	83628.62558	152525	182384

44	83612.68284	152429	182303
43	83596.74302	152332	182222
42	83580.75093	152235	182142
41	83564.76217	152139	182061
40	83548.78114	152043	181981

39	83532.79303	151946	181900
38	83516.79786	151850	181820
37	83500.79562	151754	181740
36	83484.78632	151658	181659
35	83468.76995	151562	181579

34	83452.74652	151466	181499
33	83436.71603	151370	181419
32	83420.67848	151275	181340
31	83404.63387	151179	181260
30	83388.58220	151084	181180

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33 || Sinus | Tangens | Secans

30	55193.69853	66189	119920
31	55217.95295	66230	119944
32	55242.20269	66272	119967
33	55266.44777	66314	119990
34	55290.68816	66356	120013
35	55314.92388	66398	120036

36	55339.15492	66440	120059
37	55363.38127	66482	120083
38	55387.60294	66524	120106
39	55411.81993	66566	120129
40	55436.03222	66608	120152

41	55460.23983	66650	120176
42	55484.44274	66692	120199
43	55508.64096	66734	120222
44	55532.83448	66776	120246
45	55557.02330	66818	120269

46	55581.20742	66860	120292
47	55605.38683	66902	120316
48	55629.56155	66944	120339
49	55653.73155	66986	120363
50	55677.89684	67028	120386

51	55702.05743	67071	120410
52	55726.21330	67113	120433
53	55750.36445	67155	120457
54	55774.51089	67197	120480
55	55798.65261	67239	120504

56	55822.78961	67282	120527
57	55846.92188	67324	120551
58	55871.04943	67366	120574
59	55895.17225	67409	120598
60	55919.29034	67451	120622

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	83388.58220	151084	181180
29	83372.52348	150988	181101
28	83356.45770	150893	181021
27	83340.38487	150797	180942
26	83324.30498	150702	180862
25	83308.21805	150607	180783
24	83292.12407	150512	180704
23	83276.02303	150417	180625
22	83259.91496	150322	180546
21	83243.79983	150228	180467
20	83227.67767	150133	180388
19	83211.54846	150038	180309
18	83195.41221	149944	180231
17	83179.26892	149849	180152
16	83163.11859	149755	180074
15	83146.96123	149661	179995
14	83130.79682	149566	179917
13	83114.62539	149472	179839
12	83098.44692	149378	179761
11	83082.26142	149284	179682
10	83066.06889	149190	179604
9	83049.86934	149097	179527
8	83033.66275	149003	179449
7	83017.44914	148909	179371
6	83001.22850	148816	179293
5	82985.00085	148722	179216
4	82968.76616	148629	179138
3	82952.52446	148536	179061
2	82936.27574	148442	178984
1	82920.02000	148349	178906
0	82903.75725	148256	178829
56	F 2		

34	Sinus	Tangens	Secans
0	55919.29034	67451	120622
1	55943.40370	67493	120645
2	55967.51233	67536	120669
3	55991.61622	67578	120693
4	56015.71537	67620	120717
5	56039.80978	67663	120740
6	56063.89945	67705	120764
7	56087.98438	67748	120788
8	56112.06456	67790	120812
9	56136.13999	67832	120836
10	56160.21067	67875	120859
11	56184.27660	67917	120883
12	56208.33778	67960	120907
13	56232.39420	68002	120931
14	56256.44586	68045	120955
15	56280.49296	68088	120979
16	56304.53490	68130	121003
17	56328.57228	68173	121027
18	56352.60489	68215	121051
19	56376.63273	68258	121075
20	56400.65580	68301	121099
21	56424.67410	68343	121123
22	56448.68762	68386	121147
23	56472.69637	68429	121171
24	56496.70034	68471	121195
25	56520.69953	68514	121220
26	56544.69393	68557	121244
27	56568.68355	68600	121268
28	56592.66839	68643	121292
29	56616.64843	68685	121316
30	56640.62369	68728	121341

Sine		Tangens		Secans	
60	82903.75725	148256	178829		
59	82887.48248	148163	178752		
58	82871.21070	148070	178675		
57	82854.92690	147977	178598		
56	82838.63610	147885	178521		
55	82822.33828	147792	178445		
54	82806.03346	147699	178368		
53	82789.72163	147607	178291		
52	82773.40279	147514	178215		
51	82757.07695	147422	178138		
50	82740.74411	147330	178063		
49	82724.40427	147238	177986		
48	82708.05742	147146	177910		
47	82691.70358	147053	177833		
46	82675.34274	146962	177757		
45	82658.97491	146870	177681		
44	82642.60008	146778	177606		
43	82626.21826	146686	177530		
42	82609.82944	146595	177454		
41	82593.43364	146503	177378		
40	82577.03085	146411	177303		
39	82560.62107	146320	177227		
38	82544.20431	146229	177152		
37	82527.78056	146137	177077		
36	82411.34982	146046	177001		
35	82494.91211	145955	176926		
34	82478.46741	145864	176851		
33	82462.01574	145773	176776		
32	82445.55709	145682	176701		
31	82429.09546	145592	176626		
30	82412.61886	145501	176552		
55		F 3			

34 | Sinus | Tangens | Secans

30	56640.62369	68718	121341
31	56664.59415	68741	121365
32	56688.55982	68814	121389
33	56712.52069	68857	121414
34	56736.47676	68900	121438
35	56760.42803	68942	121462

36	56784.37450	68985	121487
37	56808.31616	69028	121511
38	56832.25302	69071	121535
39	56856.18507	69114	121560
40	56880.11231	69157	121584

41	56904.03473	69200	121609
42	56927.95234	69243	121633
43	56951.86523	69286	121658
44	56975.77310	69329	121682
45	56999.67625	69372	121707

46	57023.57458	69416	121731
47	57047.46809	69459	121756
48	57071.35676	69502	121781
49	57095.24061	69545	121805
50	57119.11963	69588	121830

51	57142.99381	69631	121854
52	57166.86316	69675	121879
53	57190.72767	69718	121904
54	57214.58734	69761	121929
55	57238.44217	69804	121953

56	57262.29216	69847	121978
57	57286.13780	69891	122003
58	57309.99759	69934	122028
59	57333.87304	69977	122053
60	57357.64363	70021	122077

	Sinus	Tangens	Secans
30	82411.67886	145501	176552
29	82395.13928	145410	176477
28	82379.65273	145320	176402
27	82363.15921	145229	176328
26	82346.65873	145139	176253
25	82330.15127	145048	176179
24	82313.63685	144958	176105
23	82297.11546	144868	176031
22	82280.58711	144778	175956
21	82264.05180	144688	175882
20	82247.50952	144598	175808
19	82230.96029	144508	175734
18	82214.40410	144418	175661
17	82197.84695	144329	175587
16	82181.27085	144239	175513
15	82164.69379	144149	175440
14	82148.10978	144060	175366
13	82131.51882	143970	175293
12	82114.92091	143881	175219
11	82098.31605	143791	175145
10	82081.70424	143703	175073
9	82065.08549	143614	175000
8	82048.45980	143525	174927
7	82031.82716	143436	174854
6	82015.18758	143347	174781
5	81998.54106	143258	174708
4	81981.88761	143169	174635
3	81965.22721	143080	174562
2	81948.55988	142992	174490
1	81931.88562	142903	174417
0	81925.20442	142815	174345
550		F 4	

51 Sinus Tangens Secans

0	57357.64363	70021	122077
1	57381.46937	70064	122102
2	57405.29025	70107	122127
3	57429.10628	70151	122152
4	57452.91745	70194	122177
5	57476.72376	70238	122202
6	57500.52520	70281	122227
7	57524.32178	70325	122252
8	57548.11349	70368	122277
9	57571.90033	70412	122302
10	57595.68239	70455	122327
11	57619.45939	70499	122352
12	57643.23161	70542	122377
13	57666.99895	70586	122402
14	57690.76143	70629	122428
15	57714.51900	70673	122453
16	57738.27170	70717	122478
17	57762.01951	70760	122503
18	57785.76243	70804	122528
19	57809.50047	70848	122554
20	57833.23361	70891	122579
21	57856.96186	70935	122604
22	57880.68522	70979	122629
23	57904.40367	71023	122655
24	57928.11723	71066	122680
25	57951.82588	71110	122706
26	57975.52964	71154	122731
27	57999.22848	71198	122757
28	58022.92143	71242	122782
29	58046.60845	71285	122807
30	58070.29957	71329	122833

22 Sinus Tangens Secans

60	8181916.20442	142815	174344
59	818085.51630	142726	174273
58	818881.82124	142638	174200
57	818865.11925	142550	174128
56	818484.41034	142462	174056
55	81831.69450	142374	173983
54	81814.97174	142286	173911
53	81798.24205	142198	173840
52	81781.50544	142110	173768
51	81764.76192	142022	173696
50	81748.01147	141934	173624
49	81731.25411	141847	173552
48	81714.48983	141759	173481
47	81697.71864	141672	173409
46	81680.94053	141584	173338
45	81664.15551	141497	173267
44	81647.36358	141410	173195
43	81630.56475	141322	173124
42	81613.75900	141235	173053
41	81596.94635	141148	172982
40	81580.12680	141061	172911
39	81563.30034	140974	172840
38	81546.46698	140887	172769
37	81529.62673	140800	172698
36	81512.77957	140714	172628
35	81495.92551	140627	172557
34	81479.06456	140540	172487
33	81462.19672	140454	172416
32	81445.32198	140367	172346
31	81428.44035	140281	172275
30	81411.55183	140195	172205

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351	Sinus	Tangens	Secans
30	580701.29557	71329	122833
31	58093.97477	71373	122858
32	58117.64966	71417	122881
33	58141.31843	71461	122909
34	58164.98288	71505	122935
35	58188.64241	71549	122960
36	58212.29701	71593	122986
37	58235.94669	71637	123012
38	58259.59144	71681	123037
39	58283.23126	71725	123063
40	58306.86615	71769	123089
41	58330.49611	71813	123114
42	58354.12413	71857	123140
43	58377.74124	71901	123166
44	58401.35636	71946	123192
45	58424.96656	71990	123217
46	58448.57182	72034	123243
47	58472.17213	72078	123269
48	58495.76749	72122	123295
49	58519.35791	72167	123321
50	58542.94337	72211	123347
51	58566.52388	72255	123373
52	58590.09944	72299	123398
53	58613.67003	72344	123424
54	58637.23567	72388	123450
55	58660.79634	72432	123476
56	58684.35205	72477	123502
57	58707.90280	72521	123529
58	58731.44858	72565	123555
59	58754.98939	72610	123581
60	58778.52522	72654	123607

	Sine	Tangens	Secans
30	81411.55183	140195	172205
29	81394.65642	140109	172135
28	81377.75413	140022	172068
27	81360.84495	139936	171995
26	81343.92888	139850	171925
25	81327.00593	139764	171855
24	81310.07610	139679	171785
23	81293.13939	139593	171715
22	81276.19580	139507	171646
21	81259.24533	139421	171576
20	81242.28799	139336	171506
19	81225.32377	139250	171437
18	81208.35268	139165	171367
17	81191.37472	139079	171298
16	81174.38989	138994	171229
15	81157.39819	138909	171160
14	81140.39962	138824	171091
13	81123.39419	138738	171022
12	81106.38189	138653	170953
11	81089.36273	138568	170884
10	81072.33671	138484	170815
9	81055.30383	138399	170746
8	81038.26409	138314	170677
7	81021.21749	138229	170609
6	81004.16404	138145	170540
5	80987.10373	138060	170472
4	80970.03657	137976	170403
3	80952.96256	137891	170335
2	80935.88170	137807	170267
1	80918.79399	137722	170198
0	80901.69943	137638	170130
54	F 6		

36 Sines Tangents Secans

0.1	58778.52422	72654	123607
1	58802.05609	72699	123633
2	58825.58198	72743	123660
3	58849.10289	72788	123685
4	58872.61882	72832	123711
5	58896.12976	72877	123738
6	58919.63573	72921	123764
7	58943.13671	72966	123790
8	58966.63270	73010	123816
9	58990.12371	73055	123843
10	59013.60972	73100	123869
11	59037.09073	73144	123895
12	59060.56676	73189	123922
13	59084.03778	73234	123948
14	59107.50381	73278	123975
15	59130.96483	73323	124001
16	59154.42085	73368	124028
17	59177.87187	73413	124054
18	59201.31787	73457	124081
19	59224.75887	73502	124107
20	59248.19486	73547	124134
21	59271.62543	73592	124160
22	59295.05179	73637	124187
23	59318.47273	73681	124213
24	59341.88866	73726	124240
25	59365.29956	73771	124267
26	59388.70543	73816	124293
27	59412.10629	73861	124320
28	59435.50211	73906	124347
29	59458.89291	73951	124373
30	59482.27867	73996	124400

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	80901.69943	137638	170130
59	80884.59803	137555	170062
58	80867.48978	137470	169994
57	80850.37469	137386	169926
56	80833.25276	137302	169838
55	80816.12399	137218	169790
54	80798.98838	137134	169723
53	80781.84594	137050	169655
52	80768.69666	136967	169587
51	80747.54054	136883	169520
50	80730.37760	136800	169452
49	80713.20782	136716	169385
48	80696.03121	136633	169318
47	80678.84277	136549	169250
46	80661.65751	136466	169183
45	80644.46042	136383	169116
44	80627.25651	136301	169049
43	80610.04578	136217	168982
42	80592.82822	136134	168915
41	80575.60385	136051	168848
40	80558.37265	135968	168782
39	80541.13464	135885	168715
38	80523.88982	135802	168648
37	80506.63818	135719	168582
36	80489.37973	135637	168515
35	80472.11447	135554	168449
34	80454.84240	135472	168382
33	80437.56352	135389	168316
32	80420.27784	135307	168250
31	80402.98535	135224	168183
30	80385.68606	135142	168117
531			

36 | Sines | Tangents | Secans

30	59482.27867	73996	124400
31	59505.65940	74041	124427
32	59529.03510	74086	124454
33	59552.40576	74131	124481
34	59575.77138	74176	124508
35	59599.13196	74221	124534
36	59622.48749	74267	124561
37	59645.83798	74312	124588
38	59669.18343	74357	124615
39	59692.52382	74402	124642
40	59715.85922	74447	124669
41	59739.18946	74492	124696
42	59762.51474	74538	124723
43	59785.83487	74583	124750
44	59809.14999	74628	124777
45	59832.46005	74674	124804
46	59855.76505	74719	124832
47	59879.06498	74764	124859
48	59902.35985	74810	124886
49	59925.64964	74855	124913
50	59948.93437	74900	124940
51	59972.21401	74946	124967
52	59995.48860	74991	124995
53	60018.75810	75037	125022
54	60042.02253	75082	125049
55	60065.28187	75128	125077
56	60088.53613	75173	125104
57	60111.78531	75219	125131
58	60135.02940	75264	125159
59	60158.26840	75310	125186
60	60181.50231	75355	125214

	Sinus	Tangens	Secans
30	80385.68606	135142	168117
29	80368.37996	135060	168052
28	80351.06707	134978	167985
27	80333.74737	134896	167919
26	80316.42088	134814	167853
25	80299.08760	134732	167788
24	80281.74751	134650	167722
23	80264.40064	134568	167656
22	80247.04697	134487	167591
21	80229.68652	134405	167525
20	80212.31927	134323	167460
19	80194.94524	134242	167394
18	80177.56442	134160	167329
17	80160.17682	134079	167264
16	80142.78243	133998	167198
15	80125.38126	133916	167133
14	80107.97332	133835	167068
13	80090.55859	133754	167003
12	80073.13709	133673	166938
11	80055.70881	133592	166873
10	80038.27376	133511	166809
9	80020.83194	133430	166743
8	80003.38334	133349	166679
7	79985.92798	133268	166614
6	79968.46584	133187	166550
5	79950.99694	133107	166486
4	79933.52128	133026	166421
3	79916.03885	132946	166357
2	79898.54966	132865	166292
1	79881.05371	132785	166228
0	79863.55100	132704	166164

37 | Sinus | Tangens | Secans

0	60181.50231	75355	125214
1	60204.73113	75401	125241
2	60227.95485	75447	125268
3	60251.17348	75492	125296
4	60274.38701	75538	125324
5	60297.59544	75584	125351
6	60320.79877	75629	125379
7	60343.99699	75675	125406
8	60367.19011	75721	125434
9	60390.37812	75767	125461
10	60413.56102	75812	125489
11	60436.73881	75858	125517
12	60459.91148	75904	125545
13	60483.07904	75950	125572
14	60506.24148	75996	125600
15	60529.39880	76042	125628
16	60552.55100	76088	125656
17	60575.69807	76134	125683
18	60598.84002	76180	125711
19	60621.97684	76226	125739
20	60645.10853	76272	125767
21	60668.23510	76318	125795
22	60791.35652	76364	125823
23	60714.47281	76410	125851
24	60737.58397	76456	125879
25	60760.68998	76502	125907
26	60783.79086	76548	125935
27	60806.88659	76594	125963
28	60829.97717	76640	125991
29	60853.06261	76686	126019
30	60876.14290	76733	126047

Sinus Tangens Secans

40	79863.55100	132704	166164
39	79846.04153	132624	166100
38	79828.51331	132544	166036
37	79811.00093	132464	165972
36	79793.47260	132384	165908
35	79775.93611	132304	165844
34	79758.39288	132224	165780
33	79740.84289	132144	165717
32	79723.28616	132064	165653
31	79705.72269	131984	165589
30	79688.15247	131904	165526
29	79670.57510	131825	165462
28	79652.99180	131745	165399
27	79635.40135	131666	165335
26	79617.80417	131586	165272
25	79600.20025	131507	165209
24	79582.58959	131427	165146
23	79564.97220	131348	165083
22	79547.34808	131269	165020
21	79529.71723	131190	164957
20	79512.07964	131110	164894
19	79494.43533	131031	164831
18	79476.78430	130952	164768
17	79459.12653	130873	164705
16	79441.46185	130795	164643
15	79423.79684	130716	164580
14	79406.11291	130637	164518
13	79388.42827	130558	164455
12	79370.73690	130480	164393
11	79353.03882	130401	164330
10	79335.33402	130323	164268

37	Sinus	Tangens	Secans
30	60876.14290	76733	126047
31	60899.21803	76779	126075
32	60922.28802	76815	126104
33	60945.35285	76871	126132
34	60968.42252	76918	126160
35	60991.46703	76964	126188
36	61014.51639	77010	126216
37	61037.56057	77057	126245
38	61060.59960	77103	126273
39	61083.63346	77149	126301
40	61106.66215	77196	126330
41	61129.68567	77242	126358
42	61152.70491	77289	126387
43	61175.71719	77335	126415
44	61198.72518	77382	126443
45	61221.72890	77428	126472
46	61244.72564	77475	126500
47	61267.71809	77521	126529
48	61290.70536	77568	126557
49	61313.68744	77615	126586
50	61336.66434	77661	126615
51	61359.63695	77708	126643
52	61382.60256	77754	126672
53	61405.56388	77801	126701
54	61428.52009	77848	126729
55	61451.47093	77895	126758
56	61474.41666	77941	126787
57	61497.35718	77988	126815
58	61520.29250	78035	126844
59	61543.22262	78082	126873
60	61566.14758	78129	126902

	Sinus	Tangens	Secans
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30	79335.33402	130322	164862
29	79317.62252	130144	164208
28	79399.90430	130166	164144
27	79282.17937	130087	164088
26	79264.44773	130009	164019
25	79246.70938	129931	163957
24	79228.96433	129853	163895
23	79211.21258	129775	163834
22	79193.45412	129696	163772
21	79175.68896	129618	163710
20	79157.91710	129541	163648
19	79140.13854	129463	163587
18	79122.35329	129383	163525
17	79104.56134	129307	163464
16	79086.76270	129229	163402
15	79068.95737	129152	163341
14	79051.14535	129074	163279
13	79033.32663	128997	163218
12	79015.50123	128919	163157
11	78997.66915	128841	163096
10	78979.83038	128764	163035
9	78961.98492	128687	162974
8	78944.13279	128610	162913
7	78926.27397	128533	162852
6	78908.40848	128456	162791
5	78890.53631	128379	162730
4	78872.65746	128302	162669
3	78854.77194	128225	162609
2	78836.87975	128148	162548
1	78818.98089	128071	162487
0	78801.07536	127994	162427

38	Sinns	Tangens	Secans
0	61566.14753	78129	126902
1	61589.06723	78175	126931
2	61611.98171	78222	126960
3	61634.89099	78269	126988
4	61657.79505	78316	127017
5	61680.69389	78363	127046
6	61703.58751	78410	127075
7	61726.47591	78457	127104
8	61749.35909	78504	127133
9	61772.23704	78551	127162
10	61795.10977	78598	127191
11	61817.97726	78645	127221
12	61840.83953	78692	127250
13	61863.69656	78739	127279
14	61886.54836	78786	127308
15	61909.39493	78834	127337
16	61932.23625	78881	127366
17	61955.07233	78928	127396
18	61977.90317	78975	127425
19	62000.72877	79022	127454
20	62023.54912	79070	127483
21	62046.36422	79117	127513
22	62069.17408	79164	127542
23	62091.97862	79212	127571
24	62114.77802	79259	127601
25	62137.57211	79306	127630
26	62160.36095	79354	127660
27	62183.14452	79401	127689
28	62205.92283	79449	127719
29	62228.69588	79496	127748
30	62251.46366	79544	127778

Sinus Tangens Secans

60	78801.07536	127994	162427
59	78783.16316	127917	162366
58	78765.24429	127841	162306
57	78747.31876	127764	162246
56	78729.38656	127688	162185
55	78711.44771	127611	162125

54	78693.50219	127535	162065
53	78675.55002	127458	162005
52	78657.59118	127382	161945
51	78639.62570	127306	161885
50	78621.65355	127230	161825

49	78603.67476	127153	161765
48	78585.68931	127077	161705
47	78567.69722	127001	161646
46	78549.69847	126925	161586
45	78531.69308	126849	161526

44	78513.68105	126774	161467
43	78495.66237	126698	161407
42	78477.63705	126622	161348
41	78459.60509	126546	161288
40	78441.56649	126471	161229

39	78423.52125	126395	161170
38	78405.46938	126319	161111
37	78387.41087	126244	161051
36	78369.34573	126169	160992
35	78351.27396	126093	160933

34	78333.19555	126018	160874
33	78315.11052	125943	160815
32	78297.01887	125867	160756
31	78278.92059	125792	160698
30	78260.81568	125717	160639

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884 Sinus Tangens Secans

30	62251.46366	79544	127778
31	62274.22617	79591	127807
32	62296.98342	79639	127837
33	62319.73539	79686	127867
34	62342.48209	79734	127896
35	62365.22352	79781	127926
36	62387.95967	79829	127956
37	62410.69054	79877	127985
38	62433.41612	79924	128015
39	62456.13643	79972	128045
40	62478.85145	80020	128075
41	62501.56118	80067	128105
42	62524.26563	80115	128134
43	62546.96478	80163	128164
44	62569.65865	80211	128194
45	62592.34721	80258	128224
46	62615.03048	80306	128254
47	62637.70846	80354	128284
48	62660.38113	80402	128314
49	62683.04850	80450	128344
50	62705.71057	80498	128374
51	62728.36733	80546	128404
52	62751.01878	80594	128434
53	62773.66493	80642	128464
54	62796.30576	80690	128495
55	62818.94128	80738	128525
56	62841.57148	80786	128555
57	62864.19637	80834	128585
58	62886.81593	80882	128615
59	62909.43028	80930	128646
60	62932.03920	80978	128676

	Sinus	Tangens	Secans
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30	78260.81568	125717	160639
29	78242.70415	125642	160580
28	78224.58600	125567	160521
27	78206.46124	125492	160463
26	78188.32985	125417	160404
25	78170.19185	125342	160346
24	78152.04724	125268	160287
23	78133.89601	125193	160229
22	78115.73817	125118	160171
21	78097.57378	125044	160112
20	78079.40266	124969	160054
19	78061.22500	124895	159996
18	78043.04073	124820	159938
17	78024.84986	124746	159880
16	78006.66523	124672	159822
15	77988.44830	124597	159764
14	77970.23763	124523	159706
13	77952.02036	124449	159648
12	77933.79649	124375	159590
11	77915.56603	124301	159533
10	77897.32897	124227	159475
9	77879.08532	124153	159418
8	77860.83508	124079	159360
7	77842.57826	124005	159302
6	77824.31485	123931	159245
5	77806.04485	123858	159188
4	77787.76827	123784	159130
3	77769.48511	123710	159073
2	77751.19536	123637	159016
1	77732.89904	123563	158959
0	77714.59614	123490	158902

89 Sinus Tangens Secans

0	62932.03910	80978	128675
1	62954.64270	81027	128706
2	62977.24097	81075	128737
3	62999.83391	81123	128767
4	63022.42152	81171	128797
5	63045.00386	81220	128828
6	63067.58074	81268	128858
7	63090.15234	81316	128889
8	63112.71861	81364	128919
9	63135.27954	81413	128950
10	63157.83513	81461	128980
11	63180.38537	81510	129011
12	63202.93026	81558	129041
13	63225.46981	81606	129072
14	63248.00401	81655	129103
15	63270.53285	81703	129133
16	63293.05634	81752	129164
17	63315.57448	81800	129195
18	63338.08726	81849	129226
19	63360.59468	81898	129256
20	63383.09673	81946	129287
21	63405.59343	81995	129318
22	63428.08476	82044	129349
23	63450.57072	82092	129380
24	63473.05132	82141	129411
25	63495.52654	82190	129442
26	63517.99639	82238	129473
27	63540.46086	82287	129504
28	63562.91996	82336	129535
29	63585.37368	82385	129566
30	63607.82202	82434	129597

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	77714.59614	123490	158902
59	77696.28666	123416	158845
58	77677.97061	123343	158788
57	77659.64799	123270	158731
56	77641.31880	123196	158674
55	77622.98303	123123	158617
54	77604.64070	123050	158560
53	77586.29180	122977	158503
52	77567.93634	122904	158447
51	77549.57431	122831	158390
50	77531.20572	122758	158333
49	77512.83057	122685	158277
48	77494.44887	122612	158221
47	77476.06060	122539	158164
46	77457.66578	122467	158108
45	77439.26440	122394	158051
44	77420.85648	122321	157995
43	77402.44200	122249	157939
42	77384.02097	122176	157883
41	77365.59339	122104	157827
40	77347.15927	122031	157771
39	77328.71860	121959	157715
38	77310.27139	121886	157659
37	77291.81764	121814	157603
36	77273.35734	121742	157547
35	77254.89051	121670	157491
34	77236.41715	121598	157436
33	77217.93724	121526	157380
32	77199.45080	121454	157324
31	77180.95783	121382	157269
30	77162.45833	121310	157213

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39	Sinus	Tangens	Secans
30	63607.82202	82434	129597
31	63630.26498	82483	129628
32	63652.70255	82531	129659
33	63675.13474	82580	129690
34	63697.56154	82629	129721
35	63719.98295	82678	129752
36	63742.39897	82727	129784
37	63764.80959	82776	129815
38	63787.21482	82825	129846
39	63809.61466	82874	129877
40	63832.00909	82923	129909
41	63854.39812	82972	129940
42	63876.78175	83022	129971
43	63899.15997	83071	130003
44	63921.53279	83120	130034
45	63943.90019	83169	130066
46	63966.26219	83218	130097
47	63988.61877	83268	130129
48	64010.96994	83317	130160
49	64043.31570	83366	130192
50	64055.65603	83415	130223
51	64077.99095	83465	130255
52	64100.32044	83514	130288
53	64122.64451	83564	130318
54	64144.96315	83613	130350
55	64167.27637	83662	130382
56	64189.58415	83712	130413
57	64211.88651	83761	130445
58	64234.18343	83811	130477
59	64256.47491	83860	130509
60	64278.76096	83910	130541

	Sinus	Tangens	Secans
30	77162.45833	121310	157213
29	77143.95130	121238	157158
28	77125.43975	121166	157103
27	77106.92066	121094	157047
26	77088.39506	121023	156992
25	77069.86292	120951	156937
24	77051.32427	120879	156881
23	77032.77910	120808	156826
22	77014.22741	120736	156771
21	76995.66920	120665	156716
20	76977.10448	120593	156661
19	76958.53325	120522	156606
18	76939.95550	120451	156551
17	76921.37124	120379	156497
16	76902.78048	120308	156442
15	76884.18320	120237	156387
14	76865.57942	120166	156331
13	76846.96914	120095	156278
12	76828.35235	120024	156223
11	76809.72907	119953	156169
10	76791.09928	119882	156114
9	76772.46300	119811	156060
8	76753.82022	119740	156005
7	76735.17094	119669	155951
6	76716.51518	119599	155897
5	76697.85292	119528	155843
4	76679.18417	119457	155789
3	76660.50893	119387	155734
2	76641.82721	119326	155680
1	76623.13900	119246	155626
0	76604.44431	119175	155572

5011

40	Sinus	Tangens	Secans
0	64278 76096	83910	130540
1	64301.04157	83960	130573
2	64323.31674	84009	130604
3	64345 58647	84059	130636
4	64367.85075	84108	130668
5	64390.10958	84158	130700
6	64412.36297	84208	130732
7	64434.61091	84258	130764
8	64456.85339	84307	130796
9	64479.09042	84357	130829
10	64501.32199	84407	130861
11	64523.54811	84457	130893
12	64545.76877	84507	130925
13	64567 98396	84556	130957
14	64590.19369	84606	130989
15	64612.39796	84656	131022
16	64634.59676	84706	131054
17	64656.79009	84756	131086
18	64678.97795	84806	131119
19	64701.16033	84856	131151
20	64723.33724	84906	131183
21	64745.50868	84956	131216
22	64767.67463	85006	131248
23	64789.83511	85057	131281
24	64811.99010	85107	131313
25	64834.13961	85157	131346
26	64856.28363	85207	131378
27	64878.42217	85257	131411
28	64900.55521	85307	131443
29	64922.68277	85358	131476
30	64944 80483	85408	131509

	Sinus	Tangens	Secans.
60	76604.44431	119175	155572
59	76585.74313	119105	155518
58	76567.03548	119035	155465
57	76548.32134	118964	155411
56	76529.60073	118894	155357
55	76510.87365	118824	155303
54	76492.14009	118754	155250
53	76473.40005	118684	155196
52	76454.65355	118614	155143
51	76435.90058	118544	155089
50	76417.14114	118474	155036
49	76398.37523	118404	154982
48	76379.60286	118334	154929
47	76360.82402	118264	154876
46	76342.03873	118194	154822
45	76323.24697	118125	154769
44	76304.44376	118055	154716
43	76285.64409	117986	154663
42	76266.83296	117916	154610
41	76248.01539	117846	154557
40	76229.19136	117777	154504
39	76210.36088	117708	154451
38	76191.52395	117638	154398
37	76172.68057	117569	154345
36	76153.83075	117500	154292
35	76134.97448	117430	154240
34	76116.11178	117361	154187
33	76097.24263	117292	154134
32	76078.36704	117223	154082
31	76059.48502	117154	154029
30	76040.59656	117085	153977
49	G 3		

40	Sinus	Tangens	Secans
30	64944.80483	85408	131509
31	64966.92139	85458	131541
32	64989.03246	85509	131574
33	65011.13803	85559	131607
34	65033.23810	85609	131640
35	65055.33266	85660	131672
36	65077.42172	85710	131705
37	65099.50528	85761	131738
38	65121.58332	85811	131771
39	65143 65585	85862	131804
40	65165.72288	85912	131837
41	65187.78439	85963	131870
42	65209.84038	86014	131903
43	65231.89085	86064	131936
44	65253.93581	86115	131969
45	65275 97524	86166	132002
46	65398.00915	86216	132035
47	65320.03754	86267	132068
48	65342 06039	86318	132101
49	65364.07772	86368	132134
50	65386.08952	86419	132168
51	65408.09579	86470	132201
52	65430.09652	86521	132234
53	65452.09171	86572	132267
54	65474.08137	86623	132301
55	65496.06548	86674	132334
56	65518 04406	86725	132367
57	65540.01709	86776	132401
58	65561.98457	86827	132434
59	65583.94651	86878	132468
60	65605.90289	86929	132501

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	76040.59656	117085	153976
29	76021.70166	117016	153924
28	76002.80033	116947	153872
27	75983.89257	116878	153820
26	75964.97839	116809	153768
25	75946.05777	116741	153715
24	75927.13073	116672	153663
23	75908.19726	116603	153611
22	75889.25737	116535	153559
21	75870.31106	116466	153507
20	75851.35833	116398	153455
19	75832.39918	116329	153403
18	75813.43361	116261	153351
17	75794.46163	116192	153299
16	75775.48324	116124	153247
15	75756.49843	116056	153196
14	75737.50722	115987	153144
13	75718.50959	115919	153092
12	75699.50556	115851	153041
11	75680.49512	115783	152989
10	75661.47828	115715	152938
9	75642.45504	115647	152886
8	75623.42539	115579	152835
7	75604.38935	115511	152784
6	75585.54691	115443	152732
5	75566.29808	115375	152681
4	75547.24285	115308	152630
3	75528.18122	115240	152579
2	75509.11321	115172	152527
1	75490.03881	115104	152476
0	75470.95802	115037	152425
49		G 4	

41	Sinus	Tangens	Secans
0	65605.90289	86928	132501
1	65627.85373	86980	132535
2	65649.79901	87031	132568
3	65671.73874	87082	132602
4	65693.67291	87133	132636
5	65715.60152	87184	132669
6	65737.52457	87236	132703
7	65759.44206	87287	132737
8	65781.35399	87338	132770
9	65803.26035	87389	132804
10	65825.16114	87441	132838
11	65847.05636	87492	132872
12	65868.94601	87543	132905
13	65890.83008	87595	132939
14	65912.70858	87646	132973
15	65934.58151	87698	133007
16	65956.44885	87749	133041
17	65978.31061	87801	133075
18	66000.16679	87851	133109
19	66022.01739	87904	133143
20	66043.86239	87955	133177
21	66065.70182	88007	133211
22	66087.53565	88059	133245
23	66109.36388	88110	133279
24	66131.18653	88162	133314
25	66153.00358	88214	133348
26	66174.81503	88265	133382
27	66196.62088	88317	133416
28	66218.42113	88369	133451
29	66240.21577	88421	133485
30	66262.00482	88473	133519

	Sinus	Tangens	Secans
60	75470.95802	115037	152425
59	75451.87084	114969	152374
58	75432.77728	114902	152323
57	75413.67734	114834	152272
56	75394.57101	114767	152222
55	75375.45831	114699	152171
54	75356.33923	114632	152120
53	75337.21377	114565	152069
52	75318.08193	114498	152019
51	75298.94373	114430	151968
50	75279.79915	114363	151918
49	75260.64820	114296	151867
48	75241.49088	114229	151817
47	75222.32720	114162	151766
46	75203.15715	114095	151716
45	75183.98074	114028	151665
44	75164.79797	113961	151615
43	75145.60884	113894	151565
42	75126.41335	113828	151515
41	75107.21150	113761	151465
40	75088.00329	113694	151415
39	75068.78874	113627	151364
38	75049.56783	113561	151314
37	75030.34057	113494	151264
36	75011.10696	113428	151215
35	74991.86700	113361	151165
34	74972.62070	113295	151115
33	74953.36806	113228	151065
32	74934.10907	113162	151015
31	74914.84374	113096	150966
30	74895.57207	113029	150916
48	G 5		

41	Sinus	Tangens	Secans
30	66262.00482	88473	133519
31	66283.78875	88524	133554
32	66305.56608	88576	133588
33	66327.33829	88628	133622
34	66349.10490	88680	133657
35	66370.86589	88732	133691
36	66392.62126	88784	133726
37	66414.37102	88836	133760
38	66436.11515	88888	133795
39	66457.85367	88940	133830
40	66479.58656	88992	133864
41	66501.31382	89045	133899
42	66523.03546	89097	133934
43	66544.75147	89149	133968
44	66566.46185	89201	134003
45	66588.16660	89253	134038
46	66609.85571	89306	134073
47	66631.55918	89358	134108
48	66653.24702	89410	134142
49	66674.92922	89463	134177
50	66796.60577	89515	134212
51	66718.27669	89567	134247
52	66739.94195	89620	134282
53	66761.60157	89672	134317
54	66783.25554	89725	134352
55	66804.90386	89777	134387
56	66826.54653	89830	134423
57	66848.18354	89883	134458
58	66869.81490	89935	134493
59	66891.44059	89988	134528
60	66913.06063	90040	134563

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	74895.57207	113029	150916
29	74876.29407	112963	150866
28	74857.00973	112897	150817
27	74837.71906	112839	150767
26	74818.42205	112765	150718
25	74799.11871	112699	150669
24	74779.80904	112633	150619
23	74760.49305	112567	150570
22	74741.17073	112501	150521
21	74721.84209	112435	150471
20	74702.50712	112369	150422
19	74683.16583	112303	150373
18	74663.81822	112238	150324
17	74644.46430	112172	150275
16	74625.10406	112106	150226
15	74605.73750	112040	150177
14	74586.36463	111975	150128
13	74566.98545	111909	150079
12	74547.59996	111844	150030
11	74528.20817	111778	149981
10	74508.81006	111713	149933
9	74489.40565	111648	149884
8	74469.99494	111582	149835
7	74450.57793	111517	149787
6	74431.15462	111452	149738
5	74411.72501	111387	149690
4	74392.28910	111321	149641
3	74372.84690	111256	149593
2	74353.39840	111191	149544
1	74333.94362	111126	149496
0	74314.48254	111061	149448
48	G 6		

42	Sinus	Tangens	Secans
0	66913.06063	90040	134563
1	66934.67501	90093	134599
2	66956.28372	90146	134634
3	66977.88676	90199	134669
4	66999.48414	90251	134704
5	67021.07585	90304	134740
6	67042.66189	90357	134775
7	67064.24226	90410	134811
8	67085.81695	90463	134846
9	67107.38596	90516	134882
10	67128.94930	90569	134917
11	67150.50695	90621	134953
12	67172.05893	90674	134988
13	67193.60522	90727	135024
14	67215.14582	90781	135060
15	67236.68074	90834	135095
16	67258.20997	90887	135131
17	67279.73350	90940	135167
18	67301.25135	90993	135203
19	67322.76349	91046	135238
20	67344.26995	91099	135274
21	67365.77070	91153	135310
22	67387.22675	91206	135346
23	67408.75511	91259	135382
24	67430.23875	91313	135418
25	67451.71670	91366	135454
26	67473.18893	91419	135490
27	67494.65546	91473	135526
28	67516.11627	91526	135562
29	67537.57137	91580	135598
30	67559.02076	91633	135634

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	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	74314.48254	111061	149448
59	74295.01518	110996	149399
58	74275.54153	110931	149351
57	74256.06159	110867	149303
56	74236.57537	110802	149255
55	74217.08287	110737	149207
54	74197.58409	110672	149159
53	74178.07903	110607	149111
52	74158.56770	110543	149063
51	74139.05009	110478	149015
50	74119.52620	110414	148967
49	74199.99605	110349	148919
48	74080.45962	110285	148871
47	74060.91693	110220	148824
46	74041.36797	110156	148776
45	74021.81274	110091	148728
44	74002.25125	110027	148681
43	73982.68350	109963	148633
42	73963.10949	109899	148586
41	73943.52922	109834	148538
40	73923.94270	109770	148491
39	73904.34992	109706	148443
38	73884.75088	109642	148396
37	73865.14559	109578	148349
36	73845.53406	109514	148301
35	73825.91627	109450	148254
34	73806.29224	109386	148207
33	73786.66196	109322	148160
32	73767.02544	109258	148113
31	73747.38268	109195	148066
30	73727.73368	109131	148019
47			

12	Sinus	Tangens	Secans
30	67559.02076	91633	135634
31	67580.46443	91687	135670
32	67601.90238	91740	135707
33	67623 33461	91794	135743
34	67644.76121	91847	135779
35	67666.18190	91901	135815
36	67687.59696	91955	135852
37	67609.00630	92008	135888
38	67730.40990	92062	135924
39	67751.80777	92116	135961
40	67773.19991	92170	135997
41	67794 58631	92223	136034
42	67815.96698	92277	136070
43	67837.34191	92331	136107
44	67858.71110	92385	136143
45	67880.07455	92439	136180
46	67901.43225	92493	136217
47	67922.78421	92547	136253
48	67944.13042	92601	136290
49	67965 47088	92655	136327
50	67986.80559	92709	136363
51	68008 13455	92763	136400
52	68029.45776	92817	136437
53	68050.77520	92872	136474
54	68072.08689	92926	136511
55	68093.39282	92980	136548
56	68114.69299	93034	136585
57	68135.98739	93088	136622
58	68157.27603	93143	136659
59	68178.55890	93197	136696
60	68299.83600	93251	136733

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	73727 73368	109131	148018
29	73708.07843	109067	147972
28	73688.41696	109003	147925
27	73658 74924	108940	147878
26	73649.07530	108876	147831
25	73629 39512	108813	147784
24	73609.70871	108749	147738
23	73590 01607	108686	147691
22	73570.31720	108622	147644
21	73550.61211	108559	147598
20	73530.90080	108496	147551
19	73511.18327	108432	147504
18	73491.45951	108369	147458
17	73471.72954	108306	147411
16	73451.99334	108243	147365
15	73432.25094	108179	147319
14	73412.50232	108116	147272
13	73392.74749	108053	147226
12	73372.98645	107990	147180
11	73353.21919	107927	147134
10	73333.44574	107864	147087
9	73313.66608	107801	147041
8	73293.88021	107738	146995
7	73274.08814	107676	146949
6	73254.28987	107613	146903
5	73234.48541	107550	146857
4	73214.67474	107487	146811
3	73194.85789	107425	146765
2	73175 03483	107362	146719
1	73155.20559	107299	146674
0	73135 37016	107237	146628

43 || Sinus | Tangens | Secans

0	68199.83600	93251	136733
1	68211.10733	93306	136770
2	68242.37289	93360	136807
3	68263.63268	93415	136844
4	68284.88668	93469	136881
5	68306.13491	93524	186919
6	68327.37736	93578	136956
7	68348.61403	93633	136993
8	68369.84492	93688	137030
9	68391.07002	93742	137068
10	68412.28933	93797	137105
11	68433.50285	93852	137143
12	68454.71059	93906	137180
13	68475.91253	93961	137218
14	68497.10868	94016	137255
15	68518.29903	94071	137293
16	68539.48358	94125	137330
17	68560.66234	94180	137368
18	68581.83529	94235	137406
19	68603.00244	94290	137443
20	68624.16378	94345	137481
21	68645.31932	94400	137519
22	68666.46905	94455	137556
23	68687.61297	94510	137594
24	68708.75108	94565	137632
25	68729.88337	94620	137670
26	68751.00985	94676	137708
27	68772.13051	94731	137746
28	68793.24535	94786	137784
29	68814.35437	94841	137822
30	68835.45756	94896	137860

	Sinus	Tangens	Secans
60	73135.37016	107237	146628
59	73115.52853	107174	146582
58	73095.68073	107112	146537
57	73075.82673	107049	146491
56	73055.96655	106987	146445
55	73036.10020	106925	146400
54	73016.22766	106862	146354
53	72996.34894	106800	146309
52	72976.46405	106738	146263
51	72956.57298	106676	146218
50	72936.67573	106613	146172
49	72916.77232	106551	146127
48	72896.86274	106489	146082
47	72876.94699	106427	146037
46	72857.02507	106365	145992
45	72837.09698	106303	145946
44	72817.16274	106241	145901
43	72797.22233	106179	145856
42	72777.27576	106117	145811
41	72757.32303	106056	145766
40	72737.36415	105994	145721
39	72717.39912	105932	145676
38	72697.42792	105870	145631
37	72677.45058	105809	145587
36	72657.46709	105747	145542
35	72637.47745	105685	145497
34	72617.48167	105624	145452
33	72597.47974	105562	145408
32	72577.47166	105501	145363
31	72557.45745	105439	145319
30	72537.43710	105378	145274
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43	Sinus	Tangens	Secans
30	68835.45756	94896	137860
31	68856.55494	94952	137898
32	68877.64648	95007	137936
33	68898.73220	95062	137974
34	68919.81209	95118	138012
35	68940.88615	95173	138051
36	68961.95437	95229	138089
37	68983.81676	95284	138127
38	69004.07331	95340	138165
39	69025.12402	95395	138204
40	69046.16889	95451	138242
41	69067.20792	95506	138280
42	69088.24110	95562	138319
43	69109.26844	95618	138357
44	69130.28993	95673	138396
45	69151.30557	95729	138434
46	69172.31536	95785	138473
47	69193.31930	95841	138512
48	69214.31738	95897	138550
49	69235.30961	95952	138589
50	69256.29597	96008	138628
51	69277.27648	96064	138666
52	69298.25113	96120	138705
53	69319.21991	96176	138744
54	69340.18282	96232	138783
55	69361.13987	96288	138822
56	69382.09105	96344	138860
57	69403.03636	96400	138899
58	69423.97579	96457	138938
59	69444.90936	96513	138977
60	69465.83704	96569	139016

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	72537.43710	105378	145274
29	72517.41060	105317	145229
28	72497.37798	105255	145185
27	72477.33921	105194	145141
26	72457.29432	105133	145096
25	72437.24329	105072	145052
24	72417.18614	105010	145007
23	72397.12286	104949	144963
22	72397.12286	104888	144919
21	72377.05345	104827	144875
20	72336.89626	104766	144831
19	72316.80848	104705	144787
18	72296.71459	104644	144742
17	72276.61457	104583	144698
16	72256.50844	104522	144654
15	72236.39620	104461	144610
14	72216.27785	104401	144566
13	72196.15338	104340	144523
12	72176.02280	104279	144479
11	72155.88612	104218	144435
10	72135.74334	104158	144391
9	72115.59444	104097	144347
8	72095.43945	104036	144304
7	72075.27836	103976	144260
6	72055.11116	103915	144217
5	72034.93787	103855	144173
4	72014.75849	103794	144129
3	71994.57301	103734	144086
2	71974.38144	103674	144042
1	71954.18378	103613	143999
0	71933.98003	103553	143956

44 || Sinus | Tangens | Secans

0	69465.83704	96568	139016
1	69486.75885	96625	139055
2	69507.67478	96681	139095
3	69528.58482	96738	139134
4	69549.48899	96794	139173
5	69570.38726	96850	139212
6	69591.27965	96907	139251
7	69612.16616	96963	139291
8	69633.04677	97020	139330
9	69653.92149	97076	139369
10	69674.79032	97133	139409
11	69695.65325	97189	139448
12	69716.51028	97246	139487
13	69737.36141	97302	139527
14	69758.20665	97359	139566
15	69779.04598	97416	139606
16	69879.87941	97472	139645
17	69820.70693	97529	139685
18	69841.52854	97586	139725
19	69862.34424	97643	139764
20	69883.15403	97700	139804
21	69903.95791	97756	139844
22	69924.75587	97813	139884
23	69945.54792	97870	139924
24	69966.33405	97927	139963
25	69987.11425	97984	140003
26	70007.88854	98041	140043
27	70028.65690	98098	140083
28	70049.41934	98155	140123
29	70070.17585	98213	140163
30	70090.92642	98270	140203

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
60	71933.98003	103553	143956
59	71913.77029	103493	143912
58	71893.55427	103433	143866
57	71873.33227	103372	143826
56	71853.10418	103312	143783
55	71832.87002	103252	143739
54	71812.62977	103192	143696
53	71792.38345	103132	143653
52	71772.13106	103072	143610
51	71751.87259	103012	143567
50	71731.60805	102952	143524
49	71711.33744	102892	143481
48	71691.06076	102832	143438
47	71670.77802	102772	143395
46	71650.48921	102713	143352
45	71630.19434	102653	143309
44	71609.89341	102593	143267
43	71589.58641	102533	143224
42	71569.27337	102474	143181
41	71548.95426	102414	143139
40	71528.62910	102355	143096
39	71508.29789	102295	143053
38	71487.96063	102236	143011
37	71467.61732	102176	142968
36	71447.26796	102117	142926
35	71426.91255	102057	142883
34	71406.55111	101998	142841
33	71386.18362	101939	142799
32	71365.81009	101879	142756
31	71345.43052	101820	142714
30	71325.04491	101761	142672

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44	Sinus	Tangens	Secans
30	70090.92642	98270	140203
31	70111.67107	98327	140243
32	70132.40979	98384	140283
33	70153.14257	98441	140324
34	70173.86942	98499	140364
35	70194.59033	98556	140404
36	70215.30529	98613	140444
37	70236.01432	98671	140485
38	70256.71741	98728	140525
39	70277.41454	98786	140565
40	70298.10574	98843	140606
41	70318.79098	98901	140646
42	70339.47028	98958	140687
43	70360.14362	99016	140727
44	70380.81101	99073	140768
45	70401.47244	99131	140808
46	70422.12792	99189	140849
47	70442.77743	99247	140890
48	70463.42099	99304	140930
49	70484.05859	99362	140971
50	70504.69022	99420	141012
51	70525.31588	99478	141053
52	70545.93558	99536	141093
53	70566.54931	99594	141134
54	70587.15706	99651	141175
55	70607.75885	99710	141216
56	70628.35466	99768	141257
57	70648.94449	99826	141298
58	70669.52834	99884	141339
59	70690.10622	99942	141380
60	70710.67811	100000	141421

	<i>Sinus</i>	<i>Tangens</i>	<i>Secans</i>
30	71325.04491	101761	142671
29	71304.65327	101702	142630
28	71284.25559	101642	142587
27	71263.85189	101583	142545
26	71243.44215	101524	142503
25	71223.02639	101465	142461
24	71202.60459	101406	142419
23	71182.17678	101347	142377
22	71161.74294	101288	142335
21	71141.30308	101229	142293
20	71120.85720	101170	142251
19	71100.40530	101112	142209
18	71079.94738	101053	142168
17	71059.48345	100994	142120
16	71039.01351	100935	142084
15	71018.53756	100876	142042
14	70998.05559	100818	142001
13	70977.56762	100759	141959
12	70957.07365	100701	141918
11	70936.57367	100642	141876
10	70916.06769	100583	141835
9	70895.55570	100525	141793
8	70875.03772	100467	141752
7	70854.51374	100408	141710
6	70833.98377	100350	141669
5	70813.44780	100291	141627
4	70792.90584	100233	141587
3	70772.35789	100175	141545
2	70751.80395	100116	141504
1	70731.24402	100058	141463
0	70710.67811	100000	141421

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COMPENDIVM

DOCTRINÆ

SINVVM TANGENTIUM,
atque Secantium,

DEFINITIONES.



DICO sunt, quæ huic Doctrinæ sunt præmittenda: primò enim sciendum est in præsentî negotio, nomine arcus accipiendum esse segmentum peripheriæ circuli, minus semicirculo: quale in hac figura est, Quadrans AD, vel BC; item arcus AF, BF, quadrante minores, & CBF, quadrante maior, &c. Similiter nomine anguli, intelligi angulum rectum, acutum, vel obtusum, non tamen duobus rectis maiorem.



Secundò. Differentiâ huiusmodi arcuum, qua differunt à quadrante vocari Complementum, ut arcus AF differentiâ inter quadrantem AB, & arcum BF, est complementum arcus BF, & BF, est complementum tam arcus AF, quàm arcus CF: est enim differentia inter arcum CF, & quadrantem CB; & differentia inter arcum AF, & quadrantem AB

Vnde patet duos arcus constituentes semicirculum, quales sunt AF , CF habere commune complementum FB .

Definitio I.

Sinus totus, qui etiam radius vocatur, est semidiameter circuli, qualis in præcedente figura est semidiameter BA , EB , vel EC , &c.

Definitio II.

Sinus rectus est linea perpendicularis cadens ab una extremitate arcus dati in diametrum ductam per alteram extremitatem. Vt recta FG , est sinus rectus tam arcus AF , quam arcus CF .

Hinc constat primo, duos arcus complementes semicirculum, quales sunt AF , CF , habere communem sinum rectum FG .

Secundo, constat semidiametrum circuli, seu sinum totum, v. g. EB , esse sinum rectum quadrantis AB , vel CB .

Definitio III.

Sinus complementi, est sinus rectus arcus complementi. Vnde sinus complementi arcus AF , est recta FH : eademq. FH , est etiam sinus complementi arcus CF , quia idem arcus BF est complementum tam arcus AF , quam CF .

Quadrans autem non habet sinum complementi, quia non habet arcum complementi.

Scho -

Scholium.

IN tabula ita sunt numeri dispositi, ut è regione minorum cuiusque arcus propositi, statim se se offerant sub utroque titulo sinuum ex una parte sinus rectus, ex altera parte sinus complementi, etiam illorum arcuum, qui sunt maiores quadrante; si ipsorum loco sumantur eorundem complementa ad semicirculum.

Definitio IV.

Sinus versus est segmentum diametri inter sinum rectum, & alteram extremitatem arcus interceptum. Sinus ergo versus arcus AF, est AG; & sinus versus arcus FC, est GC; quia perpendicularis FH est sinus rectus tam arcus AF, quàm arcus FC.

Sinus autem versus complementi, est sinus versus arcus complementi.



Scholium.

Hinc patet primò duos arcus complentes semicirculum habere eundem sinum versus complementi. Et ratio est, quia habent eundem arcum complementi.

Secundò, patet eosdem arcus complentes semicirculum habere sinus versus differentes. Et sinum versus arcus minoris quadrante esse mi-

norem finu toto ; finum autē versum arcus quadrante maioris , esse finu toto maiorem . Et simul sumptos æquari toti diametro .

Tertio , colligitur ex dictis , quare non exhibeantur seorsim tabulæ finuum versorum , quia nimirum paruo labore eruuntur ex tabula finuum . Sinus enim versus arcus AF, hoc est sinus versus AG, habetur . Si ex finu toto EA , subtrahatur EG, quæ est æqualis rectæ FH, sinui complementi arcus AF. Recta verò CG. hoc est sinus versus arcus CF quadrante maioris componitur ex finu toto CE , & ex EG sinu arcus BF , qui est complementum arcus CF , &c.

Definitio V .

Tangens est portio lineæ rectæ, quæ arcum propositum tangit in altero terminorum, & intercipitur inter contactum , & diametrum productam per alterum eiusdem arcus terminum vsque ad tangentem . Ita AI, est tangens arcus AF, & eadem AI, est etiam tangens arcus



AK, qui cum AF complet semicirculum . Recta enim AI, tangit dictos arcus AF, AK in communi termino A. & KEF. Diameter transit per reliquos terminos F , K , & protracta occurrit tangenti AI, in puncto I.

Definitio VI.

Tangens complementi est tangens arcus complementi, ut recta BL est tangens complementi arcus AF, vel arcus CF.

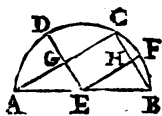
Definitio VII.

Secans est segmentum diametri definiens Tangentem, interceptum inter centrum, & Tangentem. Vnde recta EI, est secans tam arcus AF, quàm arcus AK.

Definitio VIII.

Secans complementi est Secans arcus complementi.

Definitio IX.



Chorda cuiusvis arcus est linea recta ipsum subtendens, quales sunt AC, BC, subtendentes arcus AC, BC.

Scholium.

Postquam introductæ sunt tabulæ Sinuum, cessarunt tabulæ chordarum, quæ nihil sunt aliud, quàm dupli sinus arcuum subduplorum. Recta enim v. g. ED secans bisariam arcum AC, secat etiam bisaniam, & ad angulos rectos chordam AC, in G. Suntque GA, GC, Sinus arcuum DA, DC.

CANONES PRACTICI

Pro immediato usu harum Tabularum.

EX definitionibus præmissis facile colligitur Sinus, Tangentes, & Secantes, &c. non tam esse lineas Arithmeticas, quam Geometricas. Neque dubium est, Geometriam ijs geometricè uti posse. Utitur tamen eò libèriùs, quò securiùs ijsdem lineis arithmeticè numeratis. Quamvis enim nullæ sint quantitates, quantumvis immensæ, quas Geometria speculatiua mente non comprehendat; hæc tamen facultas in praxi ita eneruatur, ut ferè sit nulla. Sed hunc Geometriæ practicæ defectum, egregiè supplet quantitas numerata, quæ non indiget iustrumentis, neque opus habet magnis spatijs, sed paucis numeris metitur sinus tangentes, & secantes etiam respectu semidiametri orbium, cælestium idque facit tam accurate, ut maior diligentia desiderari posse non videatur.

CANON I.

*Dato arcu quadrante minore; utrumque
eius Sinum, Tangentem, & Se-
cantem reperire.*

SIT primò exempli gratia, datus arcus G.
27. M. 23. Inuento numero graduum 27.
in fronte, seu capite Tabulæ (sunt enim 27. Gra-
dus

dus pauciores gradibus 45.) descenditur per
 seriem minutorum vsque ad min. 23. reperi-
 turq. è regione sub proprijs titulis sinus 45494.
 Tangens 51798. Secans 112619. & in pagina
 sequenti: Sinus complementi 89194. Tangens
 complementi 193056. & Secans complementi
 217418.

Sit secundò arcus datus G. 56. M. 33. maior
 arcu G. 45. Querantur gradus in calce tabulæ,
 & in serie minutorum ascēdatur per minuta vsque
 ad min. 33. occurretq. in illa pagina, in qua in-
 uenta sunt minuta, sub proprijs titulis Sinus
 83836. Tangens 151370. & Secans 181419.
 & in pagina sequēti occurret Sinus complemen-
 ti 54420. Tangens complem. 66063. & Secans
 complementi 119851. in partibus Sinus totius
 100000.

Vbi notandum Sinus 83836. 54420. posse
 esse accuratiores si augeantur unitate. Et hoc
 propterea quia in tabula figuræ proximè antece-
 dentes 7. & 9. superant 5. hoc est plus valent
 quàm $\frac{1}{2}$. Dictæ enim figuræ 7. & 9. valent $\frac{7}{10}$
 & $\frac{9}{10}$ & hæc fractiones addi possent Sinibus
 83836. 54420. Sed qui fractiones difficiles red-
 dunt operationes, idcirco Logistæ libenter, &
 consulto ipsas omittunt, quando minus valent
 $\frac{1}{2}$ hoc est $\frac{5}{10}$, & quando sunt maiores, affi-
 ciunt eorum loco unitatem. Sic enim minus à
 verioribus numeris recedunt.

CANON II.

Eadem reperire, dato arcu quadrante maiore.

S It datus arcus G. 123. m. 27. Subtrahatur ex semicirculo graduum 180. vel resol- uendo unū gradum in mi- nuta 60. subtrahatur
 ex G. 179. m. 60. re-
 manetq. Arcus minor-
 quadrante G. 56. m. 33.
 cuius Sinus, Tangentes, &
 Secantes sunt etiam Sinus, Tangentes, & Se-
 cantes arcus G. 123. m. 27. Illi autem habentur per Canonem præcedentem; ergo & isti.

CANON III.

Dati Arcus Sinum versum eruere.

P Et Canones præcedentes inveniatur dicti arcus Sinus complementi; sinus enim complementi, subtractus ex sinu toto relinquet sinum arcus quadrante minoris, Et sinui toti ad iectus componit sinum versum arcus quadrante maioris.

Arcus Dati.

G. 27. m. 23. Cōpl. cōe. G. 62. m. 37.
 G. 152. m. 37.

Sinus totus	10000.	100000.
Sinus cōpl.	87795.	88795.
Sinus versus	12205.	188795.
Arcus	G. 27. min. 23.	G. 152. m. 37.

CA -

CANON IV.

Inuenire sinum versum complementi.

LOco arcus dati sumatur arcus complementi . huius enim arcus Sinus versus , est sinus versus complementi arcus propositi .

CANON V.

Dati Arcus chordam exhibere .

ARcus datus diuidatur bifariam , & sinus qui per primum Canonem debetur , semissi duplicetur . Numerus enim productus est chorda arcus dati .

CANON VI.

*Sinui Tangenti , vel Secanti datis ,
suum arcum adscribere .*

SINUS, Tangens , vel Secans quærat in Tabula , & à numero inuenito procedatur versus sinistram , vsque ad primam seriem sinistram . Illic enim occurrent minuta arcus quæsitæ ; & in capite , vel calce se se offerrent eiusdem arcus Gradus . Et hoc quando constat arcum quæsitum esse quadrante minorem : quando autem est maior , tunc arcus inuentus debet subtrahi ex semicirculo graduum 180 .

CANON VII.

Eundem Arcum inuenire, quando numerus datus est Sinus Tangens, vel Secans complementi.

P Raxis quidem non differt à præcedenti, sed arcus, qui sic quæritur, est complementum illius, qui per vj. Canonem inuenitur, nisi fortassis constaret arcum quæsitum esse maiorem quadrante. Tunc enim arcus quæsitus esset ille ipse, quem vj. Canon exhibuit.

CANON VIII.

Idem præstare: primò quando numerus datus est Sinus versus.

Q Vando numerus datus est minor sinu toto, subtrahatur ex sinu toto: & quando est maior subtrahatur sinus datus ex ipso. Nam reliquus numerus erit sinus complementi arcus quæsitæ, minor quidem quadrante, quando numerus datus est, minor sinu toto, maior verò quando est maior.

Secundò, quando numerus datus est Sinus versus complementi.

F Iat subtractio, ut prius. Estque in hoc casu numerus post subtractionem residuus, sinus rectus arcus quæsitæ.

CA.

CANON IX.

Ex chorda Arcum elicere.

Secetur chorda bifariam, & semissis quaratur sub titulo finium. Et arcus illi finui respondens, duplicetur hic enim arcus duplus est ille, qui quaritur.

PRO MINVTIS SECVNDIS,
& parte proportionali.

CAnones præmissi supponunt arcus datos esse in gradibus, & in minutis primis tantum: item numeros datos esse ex eorum numero, quos tabula complectitur. Sequentes verò Canones dabunt leges etiam pro minutis secundis, & numeros datos extendent etiam ad numeros in Tabula non contentos.

CANON X.

Quid obseruandum quando minuta secunda negliguntur.

TVnc in Tabula accipiuntur numeri proximè minores, vel maiores, & hæc praxis communiter vsurpatur, quia cōmuniter non requiritur maior scrupulositas, præsertim quando Problema propositum est solitarium, &

vnica regula trium absoluitur. Loco igitur arcus G. 15. m. 7. Secund. 28. Licebit accipere arcum G. 15. m. 7. quia 18. secunda sunt citra semissem vnus minuti primi; si autem minuta secunda arcus dati essent plura 30. minutis secundis v. g. 43. tunc ratio postulat, vt pro ipsis accipiatnr vnum minutum primum, & pro arcu dato sumatur arcus G. 15. min. 8.

Similis est ratio de Sinibus, Tangentibus, & Secantibus, quando in tabula non reperiuntur præcisè. Si enim datus Sinus esset 45183. & pro ipso quæreretur arcus, eius loco acciperetur Sinus 45192. quia hic est ipsi vicinior quàm Sinus 45166. & arcus quæsitus diceretur esse G. 26. min. 52.

CANON XI.

Quando Minuta secunda non penitus negliguntur.

Viam Geometricam non est, cur hic ingredi tentemus. Longa est, & pluribus subsidijs indiget. Alia cōpendiosior extat in Tabulis Palatinis, quæ saltem dena minuta secunda non negligunt. Sed illas etiam decurrere paucorum est. Vnde super est, vt aliqua saltem diuerticula ad minuta secundaria, in tabulis nostris vulgaribus aperiamus.

Quando

*Quando pro arcu dato queritur Sinus
Tangens, &c.*

Exempli gratia; pro arcu g. 64. m. 5. sec. 37. ad quem in tabula quoad minut. prima proximè accedunt arcus gr. 64. min. 6. & g. 64. m. 54.

Arcus	maior 64. 6.	Sinus 89956.
	minor 68. 5.	89943

Differentia min. 1 partes 13
vel sec. 60.

Differentes inter se min. 1. seu secundis 60. & sinus sunt 89956. 89943. differentes inter se partibus 13. ita ut 60. Secundis respondeat differentia partium 13. Vnde pro secundis 37. argumentatur Logistæ hoc modo. Si 60. secundis debetur differentia Sinuum partium 13. quanta debetur secundis 37? hoc est, secundum leges Regulæ trium. Multiplicant 37. per 13. & productū diuidunt per 60. & sic inveniunt pro 37. secundis differentiam partium 8. fractionē enim $\frac{8}{60}$ omittunt quia minus valet quam $\frac{1}{6}$. Et hanc differentiam, addunt minori sinui partium 89943. & numerum productum 89951. dicunt esse sinum arcus propositi gr. 64. m. 5. sec. 37. Eodemq. modo procedunt in Tangentibus, & Secantibus.

Quam

*Quando pro numero dato queritur
arcus.*

VT exempli gratia pro sinu 86957. qui in
tabula non inuenitur præcisè, sed proxi-
mè maior est 89956. & proximè minor 89943.
differentes inter se partibus 13. & arcus dictis
sinibus respondentes differunt secundis 60. Dif-
ferentia verò inter
minorem sinum, &
datum est 8.

major 89956

Sinus datus 89957

minor 89943

Vnde argumentan-
tur iterum Logistæ
hoc modo. Si dif-
ferentia 13. minori
arui, gr. 64. m. 5.

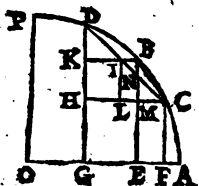
differentia 13
8

addit 60 secunda: quot addet eidem differen-
tia 8? Idq. assequuntur multiplicando 8. per
60. & productum 480. diuidendo per 13. inue-
niuntq. secunda $36\frac{12}{13}$ hoc est secunda 37. adj-
cienda minori arui gr. 64. min. 5. ita vt arcus
respondens sinui dato 89957. sit. gr. 64. m. 5.
sec. 37. & ita de alijs.

Scholium.

HAc Computistarum Praxis admitti qui-
dem potest, in minoribus arcubus qualis
est arcus vnius minuti, & minorum secundo-
rum, sed in rigore geometrico falsa est. In fi-
gura enim hic apposta, arcus datus sit, exempli
gratia, AB, proximè minor AC, & proximè ma-

ior AD. eorumq. sinus sint BE, CF, DG. Sumpta igitur GH, æquali ipsi CF, erit DH, differentia sinuum arcus proximè minoris, & maioris.



Et sumpta GK, æquali esse EB, erit KH, seu BM, differentia inter sinus AB, FC; & KH, vel BM, addita ad FC, seu EM. cōponet sinum EB, qui quæritur. Sed hæc recta BM, non est quarta proportionalis ad arcus DC, CB, & ad differentiam sinuum DH, EC.

Neque enim est, ut arcus DC, ad CB, ita DH, ad HK, vel ad BM. Nam ut DH, ad HK, hoc est ad IL, ita est per 4. sexti DC, ad CI, sed DC, ad CI, est minor proportio, quàm DC, ad CB, quia CB, est minor quàm CI: & chordæ DC, ad chordam CB, est minor proportione arcus DC, ad arcum CB, per 10. proposit. sinuum Clauij. Ergo etiam DH, ad KH. hoc est ad IL, vel ad BM minor est proportio, quàm arcus DC, ad CB.

Nihilominus quando arcus DC, est vnus tantum minuti primi, ita ut arcus DC, ad CB, possint sumi pro lineis rectis, non potest esse sensibilis error, si dicatur proportionem DH ad KH esse eandem cum proportione arcus DC, ad arcum CB. talis enim esset per 4. sexti, si arcus DC, CB. reuera essent lineæ rectæ: hæc enim ratione essent duo triangula DHC, BMC, æquiangula propter parallelas DH, BM.

CANON XII.

Quomodo utendum sit nostris Sinibus maioribus.

A Pud Pitiscum omnes sinus respondent finui toti partium 100000. & tales sunt etiam sinus nostræ tabulæ, quoad figuras, quæ versus sinistram separantur à punctis, quibus ad dexteram adiecinus aliquot alias præfertim eam ob causam, quam in præmio insinuauimus, nimirum, ut etiam illi sinus in promptu forent, ex quibus secantes, & tangentes accuratiores computari possint: id quod per sinus ordinarios fieri nequit, magni enim numeri diuisi per paruos non veros, non possunt in quotiente exhibere, plures figuras veras, quam sint in ipso diuisione. Cūque hoc accadat in multis alijs quæstionibus omninò videntur ijdem sinus maiores necessarii etiam extra calculacionem tangentium, & secantium. Vnde necesse est, ut hic peculiariter eorundem vsum doceamus, qui ita se habet. Sinui ordinario, hoc est, figuris illis, quæ supponunt sinum totum 100000 addatur fractio, & fractionis numerator fiat figuræ in tabula sinui ordinatio additæ, & denominator sit 1. cum tot cifris, quot sunt figuræ adiectæ. Factæ enim multiplicatione, vel diuisione per huiusmodi sinus ex numeris integris, & fractione compositos, inuenientur numeri multo accuratiores, quam per solos sinus ordinarios. Iuxta hanc præceptionem, sinus accuratior grad. 14. m. 40.

est

est $25544\frac{57579}{100000}$ &c. Neque tamen opus est addere semper fractionem constantem omnibus figuris adiectitijs, sed potest abbreviari fractio ad libitum omittendo vnam duas tresve figuras dextras, & diminuendo denominatorem totidem cifris. Loco enim fractionis $\frac{57579}{100000}$ posset poni fractio $\frac{575}{1000}$ vel potius hæc $\frac{576}{1000}$ addendo vltimæ figuræ 5. vnitatem propterea quod sequens figura 7. sit maior quàm 5. Erit tamen fractio eo accuratior, quo fuerit plurius figurarum. Modus autem computandi per huiusmodi fractiones non est difficilis, propter cifras, quibus constat denominator. Cifra enim neque multiplicat multiplicando, neque diuidunt diuidendo, vt constat ex Arithmetica practica.

De Angulis.

QUæ huc vsque sunt dicta de Sinibus, Tangentibus, & Secantibus, &c. Omnia istædem fere verbis referenda sunt quoque ad angulos, mutando nomen arcuum in nomen angulorum. Nam per vltimam propositionem sexti Elementorum Euclidis, eadem est ratio arcuum & angulorum ab ipsis arcubus subtensorum, estque vna eademque vtrorumque mensura.

Sicut enim arcus, ita & anguli mensurantur gradibus & minutis. Vt exempli gratia, si arcus AF, est grad. 60. FB, 30. & FBC, 120. erit etiam angulus AEF, grad. 60. angulus FEB, 30. & FEC, 120. &c.

Nihil



Nihil igitur mirum, quod arcus, & anguli omnia habeant communia, Sinus, Tangentes, & Secantes, &c. hoc est, quod verbi gratia perpendicularis FG sit sinus rectus arcuum EF, FC, & angulorum AEF. FEC, & perpendicularis FH sit sinus complementi eorundem arcuum & angulorum, immo eorundem arcuum, & angulorum tangens & secans sint rectæ AI, EL, & BL, EL, sint tangens, & secans complementi

PROBLEMAT

Triangulorum rectilineorum rectangulorum.

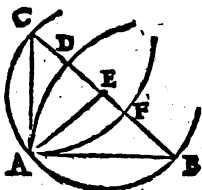
PROBLEMA I.

Ex datis angulis propositiones laterum inuenire.

IN hoc genere triangulorum præter rectum reliqui necessariò sunt acuti, iidemque per 31. primi, simul sumpti sunt æquales uni recto. Vnde fit, ut uno dato, detur quoque reliquus, quia alter est alterius complementum, hoc est, si datus liberatur ex quadrante, scilicet ex gr. 90. dabitur in eadem mensura graduum.

& m-

& minutorum etiam reliquos, verbi gratia, in triangulo ABC, sit angulus A rectus, & B. grad. 42. ergo reliquus C, erit 48.



Quibus datis datur pro-
portio laterum per Ta-
bular, non vno, sed tri-
bus modis: Primò, si
singulis lateribus affi-
guentur sinus angulorū
oppositorum, hoc est, si
lateri BC, quod opponi

tur recto A. adscribatur sinus totus 100000.
quia sinus totus est sinus quadrantis, & anguli
recti: & lateri AB adscribatur sinus 743. 4. quia
angulus C, est gr. 48. & lateri AC, sinus 66913.
quia angulus B, est grad. 42.

Centro enim E, describatur circa BC, semicirculus BAC, qui per Scholium 3 1. ter.

100000. BC
34314. AB
66913. AC.

tij transibit per angulum rectum A, & arcus AC,
 erit arcus anguli AEC. Hic autē angulus AEC.
 ad centrum E, duplus est per 20. tertij anguli
 ABC. ad peripheriam, cum ergo chorda
 AD, arcus AC, per defin. 9. dupla sit sinus di-
 midij arcus AC. erit eadem chorda etiam du-
 pla sinus anguli ABC. Eodemque modo erit
 chorda AB. dupla sinus anguli ACB. Immo &
 BC. chorda semicirculi BAC, est dupla sinus
 anguli recti: est enim semidiametri EB. du-
 pla tota diameter BC. Lineæ autem duplæ sunt
 in eadem propositione cum suis subduplis. Ergo
 proportio chordarum BC, AB, AC. habent

pro-

proportionem, quam habent sinus angulorum A. C. B. hoc est proportio trium laterum BC, AB, AC, est ea quam paulò ante assignauimus.

Secundò, si vni ex lateribus angulū rectum continētibus verbi gratia: Lateri AB, tribuatur sinus totus 100000. Erit alterum latus AC. tangens anguli oppositi 90040. nempe tangens g. 42. & BC. erit eiusdem anguli secans 134563.

Tertiò, denique si sinus totus 100000 tribuatur lateri AC: erit alterū latus AB, tangens anguli C. 111061. nimirum tangens g. 48; & BC. erit eiusdem anguli secans 149448.

Neque opus est in hoc negotio sæpiùs paginas tabulæ voluere, arque reuoluere. Inuentis enim gradibus, & minutis vnius anguli in vna paginarum, verbi gratia dextra, alter habetur in sinistra; & omnes numeri præter sinum totum, qui per se notus est, hoc est, illi qui lateribus trianguli sunt adscribendi, reperiuntur in vna, eademque linea transuersali: è regione minorum. Quod, autem verbi gratia AC, BC, respectu sinus totius AB, sint tangens, & secans anguli B, probatur hoc modo. Interuallo BA, describatur circulus; arcus enim AD, erit arcus anguli B. eiusq. tangens, & secans erunt AC, BC. per definit. 5. & 7. respectu sinus totius AB. Et similiter AB, CB. erunt

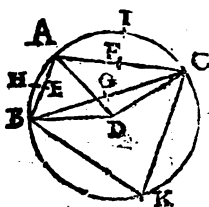
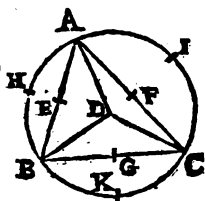
tan-

tangens, & secans anguli C . respectu sinus totius AC , si centro C . intervallo CA , describatur alius arcus AF .

A P P E N D I X.

Pro Triangulis Obliquangulis.

Hoc problema est commune etiam triangulis acutangulis, & obtusangulis. In omnibus enim proportio laterum est eadem, quæ sinuum angulorum ipsis oppositorum. Huiusmodi sunt triacula ABC , in duabus hisce figuris, acutangulum in priore, in posteriore obtusangulum; & utrique circumscriptus est circulus per s . quarti, atque ex eius corollario constat centrum circuli D . in priori figura cadere intra triangulum, in posteriori extra. In utraque



etiam figura tam latera, quàm arcus secti sunt bifariam in punctis E , F , G , & H , I , K . Dico igitur proportionem lateris AB , ad AC , esse proportionem sinus anguli ACB , ad sinum anguli ABC . Angulus enim ADB , cuius arcus est AHB , duplus est anguli ACB , per 20. terri.

Ergo

Ergo semiffis arcus AB, hoc est, AH, est arcus anguli ACB. Huius autem arcus AH sinus est AB, semiffis chordæ AB, ergo AE est sinus anguli ACB. Eodemq. modo AF est sinus anguli ABC. Cum igitur ut AE, ad AF, Semiffis ad semiffem, ita sit per 15. quati dupla AB, ad duplam AC; manifestum est proportionem AB, ad AC, esse proportionem sinuum angulorum oppositorum ACB, ABC, &c. Eadem enim est ratio reliqui lateris. Est enim similiter BG, sinus arcus KB, & arcus KB, est arcus anguli BAC siue angulus BAC, sit acutus, siue obtusus. In secunda enim figura recta BG, est sinus anguli BKC, qui cum angulo obtuso BAC, complet duos rectos per 22. tertij. Duo autem arcus complentes semicirculum, nec non duo anguli complentes duos rectos habent eundem sinum. ergo BG, sinus anguli BKC, est etiam sinus anguli obtusi BAC.

Scholium.

Quod si duo tantum anguli dentur, facile habebitur tertius, si aggregatum duorum subtrahatur ex duobus rectis, hoc est, ex gradibus 180. reliqui enim gradus, definiunt tertium.



Si autem vnus detur angulus v. g. A. Grad. 60. & reliquorum B, C. proportio sit. ut 5. ad 7. colligentur primum duo termini 5. & 7, in vnâ summam 12. & hæc habebit ad eodẽ terminos 5. & 7. eandẽ

ratio-

rationem quam habet aggregatum duorum B, C, ad eodẽ angulos B. C. Angulus autem A grad. 60. subtractus ex gra. 180. relinquit pro aggregato angulorum B. C. grad. 120. ergo grad. 120. habet ad angulos B. C. rationẽ, quam 12. ad 5. & 7. Atque adeo si fiat vt 12. ad 5. & 7. ita gr. 150. ad quatuor, inuenientur per regulam trium pro angulo B. grad. 50. & pro angulo C. gradus 70.

Postremo simili modo definiuntur singuli anguli; si vnius tantum anguli detur proportio ad reliquos. Ratio enim anguli A, ad B, sit exempli gratia, vt 6. ad 7. Et ratio eiusdem anguli A, ad C, sit vt 24. ad 28. fiat primò, vt 24. ad 28. ita angulus A. 6. ad 7. Sic enim habebitur eadem proportio in tribus terminis. eruntq. anguli A, B, C, vt 6. 7. & 7. & summa omnium nempe 18. erit aggregatum omnium trium. Et quia idem aggregatum in gradibus est grad. 180. si fiat, vt 18. singillatim ad 5. 6. 7. ita grad. 180. ad 60. 50. 70. inuentus erit angulus A, grad. 60. B. 50. & C. 70. & ita de alijs proportionibus assignatis.

PROBL. II. Vtrumque Latus.

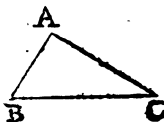
Ex base & alterutro angulo.

lorum acutorum.

Hoc est ex base, & omnibus angulis; alter enim acutus, est dati complementum, & reliquus est rectus. Basis autem nomine accipitur tum hic tum in sequentibus latus trianguli recto oppositum.

Exem-

Exemplum. Præter angulum rectum A. datus sit angulus B gr. 60. min. 20. & consequenter reliquus C. grad. 29. min. 40. & basis BC.



fit palmorum 56. Quæritur quot palmorum sint AB AC. Tribuatur basi BC, sinus totus 100000. erique per præcedens problema AB, sinus anguli C. grad. 60. min. 20. partium 86892.

Atque ita habebitur proportio BC, ad AB, & AC: & quia BC. datur, dabuntur per regulam trium in iisdem palmis etiam AB, AC. ut videre est in sequenti formula.

BC sinus totus AB. sinum. BC. pal. AB. palm.
anguli C.

$$100000 \cdot 49495 \quad 56. \quad 27 \frac{71730}{100000}$$

BC sinus totus AB. sinum. BC. pal. AC. palm.
angul. B,

$$100000. \quad 89892. \quad 56. \quad 48 \frac{65952}{100000}$$

Possiet quidem hoc ipsum problema solui etiam per Tangentes, & Secantes adscribendo sinum totum lateri AB, vel AC, iuxta præcedens problema; sed quia hic in regula trium primum locum debet occupari basis BC; idem ipsi potius attribuitur sinus totus quam lateri, quia hac ratione liberamur à divisione. Quotiens enim divisionis, hoc est, numerus quartus, qui quæritur habetur, si à summa multiplicationis secundi termini per tertium.

sepa.

separentur tot figuræ dextræ, quot sunt cifrae in
sinu toto. Reliquæ enim figuræ numerant pal-
mos, lateribus AB, AC, debitos: & figuræ se-
paratæ constituunt Numeratorem, & sinus to-
tus Denominatorem cuiusdam fractionis, qua
vna cum palmis integris constituit totum nume-
rum quartum proportionalem, hoc est, eum,
qui per regulam trium inuestigatur.

PROBL. III. LATVS.

Ex base, & altero latere.



B Asis BC, sit iterum
palm. 56. & latus AB
ponatur esse palm. 28. Quo-
niam igitur triangulum
ABC, habet rectum A. Er-
go per 47. primi quadra-

tum BC. 3136.
æquale est qua-
dratis AB, AC,
simul sumptis.
Et Quadratum
AB, sublatum
ex quadratis

BC. 56. Q. 3136.
AB. 28. Q. 784.

AC. Q. 2352.
AC. palm. 48 $\frac{497}{1000}$

AB, BC, relinquet quadratum AC, 2352.
eiusque radix quadrata dabit latus AC, palm.
 $48\frac{497}{1000}$, &c.

Aliter per numeros Tabulæ, sine extractione
radicis quadratæ. Fiat primò, vt BC, pal. 56.
ad AB. palm. 28. ita BC, sinus totus 100000.

I

ad

ad quartum

inuenieturque

AB. in parti-

bis sinus to-

tius partium

50000. est au-

tem AB, respe-

ctu sinus totius

BC, sinus anguli C, vt constat ex demonstratio-

ne primi problematis, & sinui 50000. respondet

in tabula grad. 30. Ergo angulus C. est gr. 30.

& consequenter reliquus B, grad. 60. cuius si-

nus est latus AC

respectu eiusdem

sinus totus BC.

Quare si iuxta pra-

xim primi proble-

matitis fiat, vt BC,

sinus totus 100000. ad AC. sinum anguli B.

grad. 60. hoc est, ad 86603. ita BC, palmo-

rum 56. ad quartum. Hic quattus numerabit.

AC. in pal. ostendetq. constare pal. 48 $\frac{48763}{100000}$

vt prius.

Nota. Priorem regulam sinum coincidere

tum praxi problematis septimi. Illic enim in-

uenitur angulus, ex base, & latere illi angulo

opposito.

BC. palm. 56

AB, palm. 28

BC, sinus tot. 100000

BC. sinus ang. C. 50000

Ang. C. grad. 30

Ang. B. grad. 60

BC. sin. tot. 10000

AC. sin. ang. B. 86603.

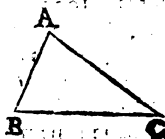
BC, palm. 56

AC. palm. 48 $\frac{48763}{100000}$



PROBL. IV. LATVS.

*Ex altero latere, & angulo acuto, ac
proinde, ex utroque; atque aded
ex omnibus tribus.*



IN triangulo ABC, ha-
bente rectum A, sit angu-
lus B, grad. 60: & consequen-
ter reliquus C, grad. 30. &
præterea datur latus AB. pal-
morum 28.

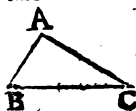
AB, Sinus totus	100000
AC, Tangens ang. B.	173 205
AB, palmorum	28
AC, palmorum	48 $\frac{49740}{100000}$

Dico etiam dari latus AC. Respectu enim si-
nus totius AB, latus AC, est tangens anguli B;
vt patet ex demonstratione primi problem. Er-
go si fiat, vt AB, sinus totus, ad AC tangen-
tem 173 205. ita AB, palmorum 28. ad quar-
tum; inuenta erit recta AB, pal. 48 $\frac{49740}{100000}$.

PROBL. V. BASIM.

*Ex vno latere, & vno angulo acuto, ac
proinde ex altero, atque aded ex
omnibus tribus.*

IN eodem triangulo, angulus datus sit B,
grad. 60. & consequenter reliquus C. gr. 30.

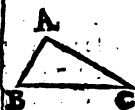


& latus AB, sit rursus palm. 28.
 & idem latus AB, intelligatur
 esse sinus totus. Hoc enim po-
 fito erit BC, secans anguli
 dati B, partium 200000. Ut
 autem eadem BC. habeatur in palmis, fiat ut
 AB, sinus totus
 100000. ad BC.
 secantem anguli
 B. 200000. ita,
 AB, palm. 28. ad
 quartū: hic enim
 numerus quartus erit BC. in palmis nem-
 pè 56.

AB, sinus totus	100000
BC, sinus ang. B.	200000
AB, palm.	28
BC, palm:	56

PROBLEM. VI. BASIM.

Ex utroque latere.



Latus AB, sit palm. 28. &
 AC, palm. 48. Eritque
 quadratum AC, 2304. & quadra-
 rum AB, 784. & simul sumpta,
 hoc est quadratum BC, (quod
 per Pythagoricam æquale est duobus quadratis
 AB, AC,) erit 3088. & radix ipsius quadrata
 erit BC: est autem dicta radix $55\frac{1}{2}$. Ergo
 BC. est palmorum $55\frac{1}{2}$.

Aliter per numeros Tabulæ. Primò inuenie-
 tur ex utroque latere alter angulorum acutorum
 hoc modo, estq. praxis prubeml octau. Respe-
 ctu enim sinus totius AB, recta AC, est tan-
 gens anguli B. est autem proportio AB, ad AC

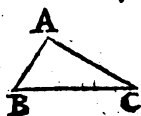
data

data in palmis, hoc est AB ad AC, est vt 28. ad 48. ergo per regulam trium dabitur quoque tangens AC. si fiat vt 28. ad 48. ita AC, sinus totus 100000. ad quartum. Quartus autem numerus est $171428\frac{1}{2}$ & huic in tabula respondent proxime gr. 59. m. 44. ergo angulus B est grad. 59. m. 44. & reliquus C, gr. 30. m. 16.

Deinde ex latere v.g. AB & angulo B, inuenitur basis BC, vt dictum est in problemate precedenti.

PROBL. VII. ANGVLVM.

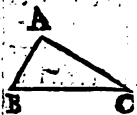
Ex base & vno latere.



B Asis BC sit pal. 56. AB 28. & eadem basis BC, intelligatur esse sinus totus. eritque AB respectu eiusdem sinus totius sinus anguli C. Et hic sinus habebitur si fiat vt BC, BC, pal. 56
56. ad AB, 28. ita BC AB, pal. 28
sinus totus 100000. BC, sin. tot. 100000
ad quartum nempe ad AB, sin. ang. C. 50000
50000. sinus igitur anguli C, est 50000. & angulus C, gr. 30.

PROBL. VIII. ANGVLVM

Ex vtroque latere.



L Actus AB, sit palm. 28. AC 48. ipsique AB tribuatur sinus totus. igitur AC respectu huius sinus totius erit tangens

I 3

anguli

anguli B, & hæc tangens habebitur si fiat vt AB.
 p. 28. ad AC p. 48. ita AB sinus totus 100000.
 ad quartum, hoc est ad AC, quatenus est tangens
 anguli B. AB, pal. 28
 Quartus autē AC, pal. 48
 proportionalis AB, sinus totus 100000
 est $171428\frac{1}{2}$ AC, Tang ang. B, $171428\frac{1}{2}$
 eique respondent gr. 59. m. 45. Ergo totidem
 graduum est angulus B.

PROBLEMAT A

Triangulorum rectilinearum Ob-
 liquangulorum .

PROBLEMA IX.

Segmenta lateris à perpēdiculari facta
Ex omnibus tribus lateribus datis .

IN triangulo Aequilatero, & Ifofcelio, per-
 pendicularis demissa in basim, secat ipsam
 bifariam per 3. tertij .

In triangulis rectangulis, latera circa rectum
 sunt sibi inuicem perpendicularia, & ideo seg-
 mentum à perpendiculari factum est vnum tan-
 tum, hoc est, ipsum latus in. quod cadit per-
 pendicularis .

Quando vero perpendicularis descendit ex
 angulo recto, & quando in triangulis non re-
 ctangulis latera ipsi perpendiculari contermina
 sunt inequalia, tunc segmenta basis inueniun-
 tur hoc modo .

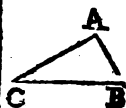
In

extra, eo quod quotiens EC, maior sit base BC. Et hoc est quod in priori casu EC subtrahenda sit ex BC, & in posteriori BC, ex EC, ut habeatur BE, quæ quidem, facta subtractione inuenitur esse 10. eiusque medietas DE, vel DB, 5. & hæc eadem medietas est semper vnum ex sequentis basis: alterum vero nempe DC producitur, si in priori casu dicta medietas DE addatur quotiēti EC, & in posteriori eadem medietas adijciatur basi BC, vel certè medietas ED subtrahatur ex quotiente EC.

PROBL. X. Duo latera.

Ex tertio latere, & duobus angulis, atque adeo ex omnibus tribus.

A Ggregatum enim duorum sublatum ex grad. 180. relinquit tertium. Atque ita per Appendicem primi Problematis dabuntur



etiam proportionēs laterū, si singulis lateribus assignentur finis angulorum oppositorum, ut videre est in duabus formulis hic subiectis, quarum prior spectat ad triangulum acutangulum ABC, posterior ad obtusangulum DEF.

	G. M.	G. M.	G. M.
Anguli dati	A 75. 45.	B. 67. 23.	C. 36. 52.
Sinus.	BC. 96923.	AC. 92310.	BA. 5995
Latus datum.	AB. 13.		

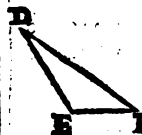
G. M.

G. M. G. M. G. M.

Anguli dati D 30 31. E. 112. 37. F. 56. 52.

Sinus . EF. 50779. DF. 92310. DE. 59995.

Latus datum . DE 13.



Ex quibus facile est ex dato latere reliqua deducere: si primo loco in regula trium statuatur sinus adscriptus lateri dato; secundo loco sinus adscriptus lateri quæsito; & tertio loco ipsum latus datum. quartus enim numerus exhibebit latus quæsitum in partibus lateris dati.

Exemplum in quo inuenitur latus AC.

AB sinus anguli AC sinus. AB. AC.

C.

ang. B.

59995

92310.

13.

20 $\frac{330}{59995}$

PROBL. XI. Latus.

Ex duobus lateribus, & duobus angulis atque adeo omnibus tribus.

Hoc problema non differt à præcedenti, nisi quod hic loco vnus lateris dentur duo, ex quorum utrolibet potest satisfieri quæsito. Posuisset igitur præteriri: sed Clauium sequimur præterintem.

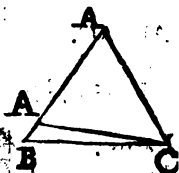
PROBL. XII. Latus

Ex duobus lateribus, & duobus angulis atque adeo omnibus tribus.

Primo ex eisdem datis inveniuntur per Probl. 14. reliqui duo anguli, & postea latus reliquum per 11. vel 10. Problema.

PROBL. XIII. Latus

Ex duobus lateribus & angulo vni eorum opposito, si constet species anguli alteri lateri oppositi.



Exempli gratia latus AC sit 9 BC. 10. & angulus B. grad. 60. per Appendicem primi Problemæ fiat Vt AC.

Ad BC 10

Ita AC, sinus anguli B.

grad. 60.

ad BC, finum anguli A

Grad. 74. m. 12. si fuerit acutus, vel gr. 105.

m. 48. si fuerit obtusus

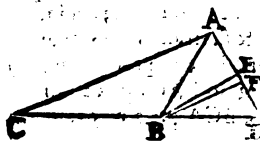
Reliquus autem angulus C, habetur, si aggregatum duorum angulorum B, A, subtrahatur ex duobus rectis remanet enim angulus C.

Et hinc denique elicitur tertium latus BC, si per 10. probl. fiat vt AC sinus anguli B. ad AB finum anguli C, ita AC, ad AB.

PRO-

P. R. O B L. XIV. Angulos duos
Ex duobus lateribus, & angulo ab
ipsis comprehenso.

IN triangulo ABC, angulus B sit graduū 720.
eiusq; complementū ad duos rectos, hoc est,
angulus ABD, gr. 60. Latus AB, 13. & BC, 17.
Sitque BD, æqualis BA, & iuncta AD, secetur
bisariam in E, & lateri AC, sit parallela BF,



Eritque, per 2. sex-
ti vt CB ad BD, ita
AF, ad FD, hoc est
si, ipsi AF, adscri-
batur numerus 17,
reliqua FD, erit 13

& tota AD, 30. respondebit aggregato duorum
laterum AB, BC, & AE, ED erunt semisses eius-
dem aggregati, nempe 15. & BF 2. respondebit
differentiæ quæ minus latus AF, 17. excedit se-
missẽ aggregati laterum AF 15. vel differentia
quæ eadem semissis ED, 15. si perat minus latus
FD, partium 13. Ad hæc recta BE, est perpendi-
cularis ad AD, per coroll. 3. tertij, & in triangu-
lis rectangulis BED, BEF, si BE fiat sinus totus,
recta ED, est tangens anguli EBD, gr. 30. quia
est semissis ang. $\angle$ ABD, graduum 60. Et EF, est
tangens anguli EBF, quo dato dantur etiam
anguli BAC, BCA, His enim sũt æquales FBA,
FBD, per 29. primi propter parallela AC, BF,
& angulus EBF, est differentia inter angulum
FBA, & semissẽ EBA, nec non differentia in-
ter angulum FBD, & eandẽ semissẽ EBD, to-

tius anguli ABD. Hic autem angulus differentiz EBE, inuenitur, vt sequitur :

Vt ED, semissis aggregati duorum laterum, AB, BC, hoc est vt 15

Ad EF, differentiam inter dictam semissem, & inter latera hoc est ad 2

Ita ED, quatenus respectu sinus totius BE, est tangens anguli EBD. gr. 30. nempè 26795

Ad quantum, hoc est, ad EF, Tangentem anguli EBF, $3572\frac{8}{15}$

Cui in tabula respondent g. 2. m. 3. addenda angulo EBA. g. 30. & subtrahenda ex angulo EBD. Hac enim ratione inueniuntur pro angulo FBA. hoc est pro angulo BAC. g. 32. m. 3. & pro angulo FBD, siue BCA, g. 27. m. 57.

PROBL. XV. Angulos duos
Ex duobus lateribus, & angulo
vni eorum opposito.

Vide Probl. 13. illic enim ex iisdem inueniuntur duo anguli antequam inueniatur tertium latus.

PROBL. XVI. Tres Angulos
Ex omnibus tribus lateribus.

In triangulo æquilatèro singuli anguli sunt grad. 60.

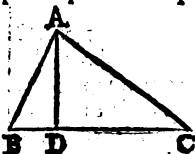
In triangulo Isoscelio, v.g. in triangulo ABC, cuius latera æqualia AB, AC sunt partium 12. & basis BC 10. secta basi BC, bisariam, sunt

segmen-



segmenta DB, DO partium 5. & si in triangulo rectangulo ADB, (est enim AD, ad BC, perpendicularis per 3. tertij) AB cogitetur esse sinus totus, erit BD sinus anguli BAD, fiat ergo, vt AB 12. ad BD 5. ita AB, sinus totus 100000. ad quartum 41666. $\frac{5}{12}$. Hic enim quartus erit sinus anguli BAD. g. 24. m. 17. eiusq; complementum ABD, necnon angulus ACB, grad. 65. m. 43. & angulus BAD duplicatus, dabit pro reliquo angulo BAC gr. 48. min. 34.

In reliquis triangulis laterum inæqualium, v.g. in triangulo ABC, cuius maximum latus est partium 21. reliqua AB, AC partium 13. & 20. linea perpendicularis AD, solet duci ad maximum latus; ita vt cadat intra triangulum, ac primo per nonum problema reperiuntur segmen-



ta BD, DC, quæ sunt 5. & 16. secundo in triangulo rectangulo ADB per latera AB, BD inquiritur angulus DAB, vt factum est in triangulo Isocelio; & similiter angulus DAC, in triangulo rectangulo ACD, ex duobus lateribus AC, CD. Horum enim complementa sunt B, & C, & reliquus angulus A componitur ex duobus DAB, DAC, vt

AB	13
AC	20
BC	21
BD	5
DC	16

DAB,	g. 22 m. 37
ABC,	g. 67. m. 23

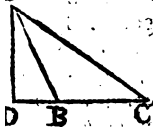
dere est in hac ta-
lla.

Quando autem per-
pendicularis AD cadit

DAC, g. 53. m. 8

ACB, g. 36. m. 52

BAC, g. 75. m. 45

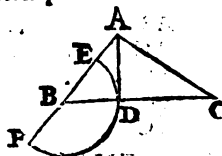


extra triangulum, vt contin-
git in hoc altero triângulo ob-
tusangulo ABC in quo basis
BC est partium 11. & reliqua
lateralia AC, AC 13. & 20. vt
prius, computatio instituitur
videm vt antea, sed angulus ABC, nō est com-
plementum anguli CAB, sed est complementum
anguli DBA, ad duos rectos, & angulus BAC,
non componitur ex DAB, DAC, sed est differen-
tia inter inuentos DAC, DAB.

PROBL. XVII. Perpendicularem.

Ex omnibus tribus lateribus.

IN triangulo ABC sit AB 10. AC, 17. & BC
21. sitque inuestiganda perpendicularis AD.
per Problema 9. reperiatur segmentum BD,
& CD 15. quorum alterutrum sufficit in præ-
senti negotio. Deinde centro B intervallo BD
descriptus sit semicirculus EDF, eritque AF,



aggregatū lateris AB,
& segmenti BD, 16.
& AE eorundem diffe-
rentia 4. & rectangulū
FAE 64. erit per 35.
tertij æquale quadrato

perpendicularis AD quia AD, tangit circulum
EDF, in D. Cum igitur rectangulū FAE, detur

fitque

fitque 64. erit & quadratum AD, 64. & radix ipsius quadrata 8. numerabit quæ sitam perpendiculararem AD.

TRIANGVLA SPHAERICA Rectangula.

In quibus sunt plures recti, vel plures arcus perpendiculares.

Quando in triangulo sphærico omnes anguli sunt recti: omnes tres arcus sunt quadrantes: quia tunc quilibet duo transeunt per polos reliqui.

2 Quando omnia latera sunt Quadrantes omnes tres anguli sunt recti.

3 Quando sunt duo anguli recti v.g. A, C, duo arcus AB, BC sunt quadrantes: & consequenter arcus AC, est arcus anguli ABC, Unde dato arcu AC datur quoque angulus B. Similiter ex angulo B cognoscitur arcus AC.



4 Quando sunt duo quadrantes v.g. BA, BC, & consequenter in B, est polus reliqui arcus AC: tunc etiam duo anguli A, C, sunt recti, & arcus AC est iterum arcus anguli B.

5 Fieri non potest ut in triangulo rectangulo vnus tantum arcus sit quadrans. Sit enim angulus A, rectus, & primo alterutrum laterum v.g. AC, sit quadrans, erit igitur C polus arcus AB, & consequenter etiam CB, quadrans. De

inde

inde sit basis BC quadrans : erit igitur in AC polus arcus AB , non tamen in C , si AC non est quadrans, sed v.g. in D , ducto igitur arcu BD , erunt BC , BD , quadrantes, & B , erit polus arcus AC , atque adeo propter quadrantem BC , erit alius quadrans BA .

6 Quare cum non possit esse vnus tantum quadrans, necesse est vt qui in triangulo dat vnum quadrantem, concedat dari alterum, & saltem duos angulos rectos.

7 Quando angulus v.g. A . rectus est & nullus arcuum quadrans, vnus tantum est rectus. Si enim essent duo recti, essent duo quadrantes, quod est contra hypothesim.

PROBLEMAT A

Rectangulorum in quibus vnus tantum est rectus.

PROBL. I. Queritur angulus
Ex base, & latere quod angulo quæsito
opponitur.

Basis nomine accipitur hic & in sequentibus arcus angulo recto oppositus. Rectus vocatur semper litera B , quæ situm puncto, & data hoc altero signo † Demonstrationes vero omittuntur, eo quod proprium opusculum requirant, & breuitatis causa vna tantum Analogia in singulis Problematis addu-

citur

citur, ex sex quæ apud Clauium habentur ad finem primi libri Astrolabij in quibus omnibus ingreditur sinus totus. sine autem sinu toto, sunt adhuc totidem aliæ analogiæ.



In hoc primo triangulo inuestigandus sit angulus C, ex basi AC, gr. 60. & latere AC, gr. 20. m. 52.

Analogia.

Vt sinus totus.	100000
Et sinum lateris AB.	34530
ita est secans compl. basis AB,	115470
ad sinum anguli C.	39837

Cui in tabula pro angulo C. respōdent g. 23. m. 29. Indice B. Inuentus enim angulus erit acutus si datum latus fuerit quadrante minus, obtusus si maius, ita vt latus AB, ab Adriano Romano non immerito vocetur operationis Index, Angulus enim C, sequitur speciem & similitudinem arcus AB.

PROBL. II. Angulus
Ex base, & latere quod angulo quesito adiacet.



Angulus inuestigandus sit iterum C, basis data AC, grad. 60. & latus BC, gr. 5. m. 45.

Analogia.

Vt sinus totus.	100000
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Ad

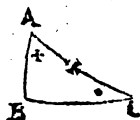
Ad tangentem compl. basis, AC.	57735
Ita est tangens lat. BC.	158797
Ad sinum compl. anguli C.	91681
Cui in tabula respondent gr.23. m.32.	

Indice BC, & AC.

Angulus enim C erit acutus si tā basis quam latus dātum quadrante maius fuerit, aut minus : obtusus vero si alterum datorum fuerit quadrante maius, & alterum minus. Hoc est similitudo indicum BC, AC, arguit angulum C acutum, dissimilitudo obtusum,

PROBL. III. Angulus

Ex base, & altero angulo non recto.



SIt iterum inuestigandus angulus C, & basis AC, sit 60.gr. vt prius, & angulus A, sit gr.77. m.43.

Analogia.

Vt sinus totus.	100000
Ad sinum compl. basis AC.	50000
Ita tangens anguli A.	459283
Ad tangen. compl. anguli C.	229641
Cui in tabula respondent gr.23. m.32.	

Indice AC, & B.

Angulus enim inuentus erit acutus, si inter AC, & B. fuerit similitudo, hoc est si AC, sit minor quadrante, & B minor recto: vel BC maior

qua-

quadrante, & B maior recto. Si vero fuerit dissimilitudo inter A C, & B. Angulus C erit obtusus.

PROBL. IV. Angulus.

Ex latere angulo quæsito opposito, & altero angulo non recto.



A Angulus investigandus sit idem angulus C.

Latus datum AB g. 20. m. 12.

Angulus A g. 77. m. 43.

Analogia.

Vt sinus totus 100000

Ad sinum anguli A 97711

Ira est sinus compl. lateris AB 93849

Ad sinum compl. anguli C. 91704

Cui in tabula respondent g. 23. m. 32.

Indice AB.

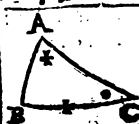
Inuentus enim angulus C, e rit acutus, si latus datum fuerit quadrante minus: obtusus si maius.

PROBL. V. Angulus.

Ex latere, quod angulo quæsito adiacet, & altero angulo non recto.

D Vnde modo constet, num quæsitus angulus maior sit recto, an minor: vel an basis, aut latus alterum non datum quadrante maius sit, minusve.

Angu-



Angulus inuestigandus

Latus datum BC. g. 57. m. 48.

Angulus datus A. g. 77. m. 43.

Analogia.

Vt sinus totus

100000

Ad secantem lateri BC

187662

Ita est sinus compl. anguli dati A

21275

Ad sinum anguli C.

39925

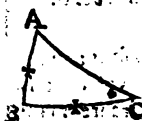
Cui in tabula respondent grad; 23. m. 32.

Indice AB, vel AC, & A.

Angulus enim inuentus erit acutus, si alterum latus non datum nempè AB, quadrante fuerit minus; obtusus, si maius. Item si basis AC fuerit minor quadrante, & datus angulus A, acutus; vel si basis AC, fuerit maior quadrante, & angulus obtusus, erit etiam C acutus. Denique si inter basim AC, & angulum A, fuerit dissimilitudo; erit angulus C obtusus.

PROBL. VI. Angulus.

Ex utroque latere circa angulum rectum.



Angulus inuestigandus

Latus datum AB. g. 20. m. 12.

Alterum latus datum BC. g. 57. m. 48.

Analo-

Analogia .

Vt finus totus	100000
Ad finum lateris BC. adjacentis	84619
Ita est tangens complementi latè, AB oppositi.	271792
Ad tangentem complementi an- guli C.	229988
Cui in tabula respondent gr. 23. min. 30.	

Indice AB.

Angulus enim C. est acutus, si datum latus AB, fuerit minus quadrante: obtusus verò si maius. Hoc est inter AB, & D, est perpetuo similitudo.

PROBLEM. VII. Latus.

Ex base, & altero latere.



L Atus quod quæri-	
tur	AB
Basis data AC.	g. 60. m. 00
Altarum latus	
datum BC.	g. 57. m. 48

Analogia .

Vt finus totus	100000
Ad secantem dati lateris BC.	186661
Ita est finus compl. basis AC	50000
Ad finum compl. lateris AB.	93830
Cui in tabula respondent g. 20. m. 14.	

Indi-

Indice AC , & BC .

Quorum similitudo arguit latus AB , esse minus quadrante: dissimilitudo verò, quadrante maius.

PROBL. VIII. Latus.

Ex base, & angulo, qui lateri quaesito opponitur.



Latus quod quaeritur

Basis data AB

Angulus datus C .

$g. 60. m. 00$

$g. 22. m. 30$

Analogia.

Ut sinus totus

100000

Ad sinum basis, AC ,

86603

Ita est sinus anguli dati C .

39875

Ad sinum lateris AB .

34533

Cui in tabula respondent $g. 20$.

min. 302.

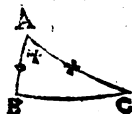
Indice C .

Latus enim AB , est semper simile angulo opposito.

P. R. Q.

PROBL. IX. Latus.

Ex base, & angulo, qui lateri quæsito
adiacet.



Latus quod qua-
ritur

AB
Angulus A datus g. 77. m. 43
Basis data. g. 60. m. 00

Analogia.

Vt sinus totus.	100000
Ad sinum compl. anguli A.	21275
Ita est tangens basis AC.	173205
Ad tangentem lateris AB.	36849
Cui in tabula respondent grad. 20. min. 14.	

Indice AC, & A.

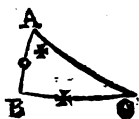
Erit enim latus AB, quadrante minus, si ba-
sis AC minor fuerit quadrante, & datus angulus
rectus, aut si basis fuerit quadrante maior, &
angulus A. obtusus. Ita ut sit similitudo inter
AC, & A: cum verò fuerit dissimilitudo, erit
arcus AB, quadrante maior.

PROBL. X. Latus.

Ex altero latere, & angulo qui quæsi-
to lateri adiacet.

SI modo constet num quæsitum latus, sit
quadrante maius, an minus; vel an alter
angu-

angulus non rectus fit acutus, obtusive, vel denique num basis fit quadrante maior, vel minor.



Latus quod queritur

AB

Angulus datus

A.

g. 77. m. 43

Latus datū BC.

g. 57. m. 48

Analogia.

Vt sinus totus

100000

Ad tang. compl. anguli A.

21773

Ita est tang. lateris BC.

158797

Ad sinum lateris AB.

34575

Cum in tabula respondent gr. 20.
min. 14.

Indice C, vel AC, & BC.

Quando inter AC, & BC. est similitudo tunc arcus AB, est minor quadrante, quando vero est dissimilitudo. tunc arcus AB, est maior quadrante.

PROBL. XI. Latus.

Ex altero latere, & angulo, qui lateri quæsito opponitur.



Latus quod queritur

AB

Latus datum

BC.

g. 57. m. 48

Angulus datus C.

g. 23. m. 30

Ana-

Analogia .

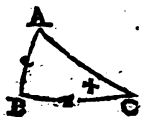
Vt sinus totus	100000
Ad finum lateris dati	84619
Ita est tangens anguli C dati	43481
Ad tangentem lateris AB.	36793
Cui in tabula respondent g. 20. min. 12.	

Indice C.

Est enim similitudo inter angulum C , & latus AB .

PROBL. XII. Latus .

Ex utroque Angulo non recto .



L Latus quod quaeritur
Angulus datus

AB

g. 77. m. 43

Angulus datus C.

g. 23. m. 30

Analogia .

Vt sinus totus.	100000
Ad secantem compl. anguli A	102343
Ita est sinus compl. anguli C.	91706
Ad finum compl. lateris AB.	93855
Cui in tabula respondent g. 20. min. 12.	

Indice C.

Ita ut sit similitudo inter C. & AB.

K

PRO-

PROBL. XIII. Basis.

Ex latere, & Angulo ei adiacente.

B Afis inuesti-
ganda
Angulus A da-
tus
Latus AB, datū

AC

g. 72. m. 43

g. 20. m. 12

Analogia .

Vt sinus totus	100000
Ad sinum compl. anguli A.	21275
Ita est tang. compl. lateris AB.	271792
Ad tang compl. basis AC.	52824
Cui in tabula respondent grad. 59. min. 58.	

Indice AB, & C.

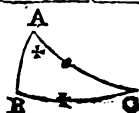
Quorum similitudo arguit basim AC, esse
quadrante minorem, dissimilitudo maiorem;

PROBL. XIV. Basis.

Ex latere, & Angulo ei opposito .

Modo constet num basis quadrante maior
fit, vel minor; aut an alter angulus non
datus sit acutus, obtusive, aut denique num
alterum latus non datum, minus fit quadrante,
an maius .

Basis



Basis inuestiganda

AC

Angulus datus A

g. 77. m. 43

Latus datum BC

g. 57. m. 48

Analogia.

Vt sinus totus.

100000

Ad secant. compl. anguli A.

102345

Ita est sinus lateris BC.

84619

Ad sinum basis AC.

86602

Cui in tabula respondent gr. 60. m. 0.

Indice C, & A, vel AB, & BC.

Tam enim similitudo C, & A, quam AB, & BC, arguit basim AC, esse quadrante minorem, & dissimilitudo maiorem.

PROBLEM. XV. Basis.

Ex utroque latere.

Basis inuestiganda

AC

Latus datum AB.

g. 20. m. 12

Alterum latus datum BC.

g. 47. m. 48

Analogia.

Vt sinus totus.

100000

Ad sinum compl. lateris AB.

93849

Ita est sinus compl. alterius lateris BC.

53288

K 2

Ad

Ad finem comp l. basis AC.

50010

Cui in tabula respondent gr. 60.
min. 0.

Indice AB, & BC.

Quorum similitudo arguit basim AC, esse
quadrante minorem, dissimilitudo maiorem.

PROBL. XVI. Basis.

Ex utroque Angulo non recto.



Basis inuesti-
ganda : AC
 Angulus datus A. g. 77. m. 43
 Alter angulus da-
 tus G. g. 23. m. 30

Analogia.

Vt sinus totus	100000
Ad tangen. compl. anguli A.	21773
Ita est tang. compl. alterius an- gali C.	229984
Ad finem compl. basis AC.	50074
Cui in tabula respondent gr. 59. min. 57.	

Indice A, & C.

Quorum similitudo arguit basim AC, esse
minorem quadrante : dissimilitudo maiorem.

Trian-

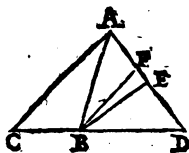
TRIANGVLA SPHAERICA

Obliquangula.

PROBLEM. XVII.

*Datō aggregato duorum arcuum, vel
angulorum, quod grad. 180. minus
sit, vñd cum proportione, quam eo-
rundem sinus habent: vtrumque il-
lorum efficere notum.*

Hoc problema non differt à 12 proble-
mate rectilineorum, nisi solo modo
proponendi. Aggregatum enim
duorum Angulorum BAC, BCA, est angulus
ABD, & in lateribus BA, BC, habetur, vel da-
tur proportio sinus anguli
BCA, ad sinum anguli
BAC, & hæc est eadem
cum proportione DF, ad
FA, &c. & ex istis datis
inuenitur denique singilla
tim vterq. angulus BAC,
BCA: vnde non est, quod



hic iterum eadem repetamus.

PROBL. XVIII.

Dato aggregato duorum arcuum, quorum singuli semicirculo sint minores; vel angulorum, quod minus sit duobus rectis, una cum proportione sinuum: utrumque eorum notum efficere.

Detracto hoc aggregato ex toto circulo, hoc est, ex grad. 360. supererit aliud aggregatum semicirculo minus, cum eadem proportione sinuum data. Si igitur huius aggregati uterque arcus, vel angulus inuestigetur, ut dictum est in præcedenti; & uterque inuentus ex semicirculo grad. 180. tollatur: noti fient duo arcus, vel anguli quæsit.

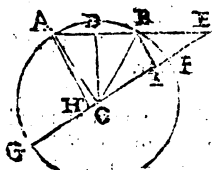
PROBL. XIX.

Data differentia duorum arcuum, quorum singuli semicirculo sint minores, vel duorum angulorum similium, una cum proportione, quam eorum sinus habent: utrumque seorsim cognoscere.

P Raxis huius problematis, prout proponitur ad ultimum lemma Astrolabij indiget cor-

rectio-

rectione, quam subministrat propositio 7. triangulorum rectilineorū olim cū Sphericis Theodosij à Clauio editorum. Estq. talis. Differentia data sit arcus AE, vel angulus ACB, grad. v. g. 60. & proportio sinuum sit data, v. g. in terminis 11, 5. quorum differentia est 6. & hæc attribatur chordæ AB, eique intelligatur adie-



Si fiat, vt DB medietas differentie terminorum, hoc est, vt 3.

Ad DE, compositam ex eadem medietate, & minore termino, hoc est ad 9.

Ita DB tangens anguli DCB, semissis anguli differentie datae nempe

58905

Ad quartum, hoc est, ad DE, tangentem anguli DCE.

157080

Cui in tabula respondent gr. 57. min. 31.

Atque hic angulus DCE, vna cum angulo DCA, grad. 30. componit totum angulum VCB, vel totum arcum AF, & angulus DCB. itidem grad. 30. ablatus ex eodem angulo DCE, relinquit angulum BCB, nec non arcum FB.

Et hæc est praxis, quando proportio finuum data est maioris inæqualitatis, si autem proportio data est minoris inæqualitatis, tunc loco arcuum AF, FB, dicto modo inuentorum accipienda essent ipsorum complementa ad semicirculum; hoc est arcus GB, GA, hi enim duo arcus habent eandem differentiam AB,

& proportio finuum est, vt 3. ad

11. In hoc enim casu arcus

maior habet minorem

sinum BI. & minor

habet maiorem

sinu n.

AH.

P R O B L E M. X X.

*Datis omnibus tribus angulis trianguli
Sphærici obliquanguli; singula
latera inuestigare.*

Plures sunt huius problematis solutiones, ego eam hic adducam, quæ ipsi communis esse potest cum sequenti, si anguli transmutentur in latera, imaginando aliud triangulum sphæricum, in quo vnum latus sit complementum ad semicirculum illius arcus, qui metitur maximum angulum, & reliqua duo latera sint ipsimet arcus duorum angulorum reliquorum. Vt si exempli gratia in triangulo ABC, angulus maximus sit A. grad. 108. quoniam eiusdem complementum ad duos rectos est angulus CAB. grad. 72. totidem gradum intelligetur esse latus EF, in alio triangulo EFG. Et si reliqui duo anguli B. & C. sint gr. 67. & 52. totidem gradus tribuentur reliquis duobus lateribus EG, EF. Atque ita in triangulo EFG, erunt omnia tria latera cognita, & consequenter per sequens problema 21. notificent omnes tres anguli G, E, F. Et complemen-



tum quidem anguli G. ad duos rectos numerabit arcum BC. angulus verò E, arcum AB. & angulus F, arcum AC, vt videbimus in sequenti problemate, cuius exemplum erit hoc ipsum triangulum EFG.

PROBLEM. XXI.

Datis tribus lateribus trianguli sphaerici
obliquanguli; quemlibet angulum
indagare.

In triangulo GEF, latus EF, sit grad. 72.
latus GF. 52. & GE. 67. & primò ex duo-
bus lateribus GE, GF, & basi EF, inuestigandus
est angulus G. huic basi oppositus.



Subtrahatur minus latus 52. ex
maiori 67. & differentia 15. ad-
scribatur suus sinus versus 3407.
basi quoque EF, adscribatur suus
sinus versus 69098. & minor sub-
trahatur ex maiori, & differentia.

EF	gr. 72.	Sin. ver.	69098
----	---------	-----------	-------

GE	gr. 67.	Sinus	92050
----	---------	-------	-------

GF	gr. 52.	Sinus	72801
----	---------	-------	-------

Differentia lat. gr. 15	Sinus ver.	3407
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Differentia sinus. vers.	65691
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horum sinuum versorum nêpè 65691. scribatur
seorsim. Denique lateribus GE, GF, adscriban-
tur Sinus 92050. 78801. vt videre est in tabel-
la hic affixa: & per duas regulas trium inueniân-
tur duo termini quarto loco proportionales se-
cundum duas analogias infra scriptas.

Pri-

Primò.

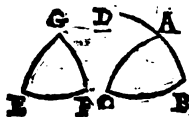
Vt finus totus	100000
Ad finum arcus GE	92050
Ita fiat finus arcus GF.	78801
Ad quartam proportionalem.	72536

Secundò.

Vt quartus proximè inuentus.	72536
Ad finum totum	100000
Ita fiat differentia sinuum versorum	65691
Ad finum versum anguli G.	90563

Qui subtractus ex sinu toto relinquit 9473
 Sinum complementi anguli G. Huic autem sinui
 complem. respondent in tabula grad. 84. min.
 35. tot ergo graduum, & minutorum est an-
 gulus G.

Et quia huic angulo æqualis est, vt in præce-
 denti problemate complementum ad duos re-
 ctos arcus CB, & subtractis g. 84. m. 35. ex 180.
 remanent grad. 95. minut. 25. sequitur vt ar-
 cus BC. in triangulo præcedentis problematis
 sit, grad. 95. min. 25.



Eodem modo inueni-
 tur ex duobus lateribus
 FG, FE, & tertio latere
 EG, angulus F; & ex duo-
 bus lateribus EG, EF, &
 tertio latere GF, angu-
 lus E, ille gr. 74. m. 29.

hic verò grad. 15. min. 33. & hi idem gradus,
 & minuta numerant in triangulo ABC. præce-

dentis problematis latera AC, AB, hoc est AC erit grad. 74. minut. 29. & AB, grad. 55. minut. 33.

Quando duo latera sunt æqualia, tunc arcus differentię est nullus, & nullus ipsius sinus versus. Ergo neque differentia sinuum versorum. Et ideo in hoc casu in postetiori regula trium, tertium locum occupabit, non differentia sinuum versorum, sed sinus versus tertij arcus, &c.

Aliter.



Ex angulo A, quem continent æqualia latera AB, AC, demissus sit arcus perpendicularis AD: eritque tam angulus A, quam basis BC, secta bifariam, eruntque facta duo triacula rectangula ADB, ADC, penitus æqualia. & in triangulo, v. g. ADB, præter rectum D, data erit basis AB, & latus BD, semissis totius basis BC.

Quare per primum problema triangulorum sphericorum rectangulorum dabitur quo.

que angulus DAB, lateri BD. oppositus, & per secundum angulus

DBA, qui eidem lateri

DB, adiacet, ex qui-

bus noti etiam

sunt an-

guli.

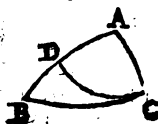
DAC, DCB, & ro-

tus BAC.

†

PROBLEM. XXII.

Datis in triangulo spherico obliquangulo duobus lateribus cum angulo ab ipsis comprehenso ; reliquum latus eum reliquis duobus angulis inquire.



H Vius quoque problematis sunt duæ analogiæ, & duæ Regulæ trium, quibus eruitur tertium latus ex duobus lateribus datis, quæ sint v. g. AB, & AC, illud grad. 72. hoc 43, cum eorundem differentia BD. grad. 29. Angulus verò A, sit grad. 112.

AB.	72.	Sinus	95106
AC.	43.	Sinus	68200
Different.	29.	Sin. vers.	12538
Angul. A.	112.	Sin. vers.	137461

Eruntque sinus laterum 95106. 68200. Sinus versus differentię laterũ 12538. & sinus versus anguli A. 137461. maior sinu toto, quia angulus A, est obtusus.

Prior Analogia.

Ut Sinus totus: 100000
Ad sinum vnus lateris, v. g. AB. 95106

Ita

Ita sinus alterius lateris AC. 68200
 Ad quartum. 64852

Posterior Analogia.

Vt sinus totus. 100000

Ad quartum prioris analogiæ. 64862

Ita sinus versus anguli A. 137461

Ad differentiam inter sinum versum
 tertij lateris, & sinum ver-
 sum differentiæ laterū BD. 89160

Quæ differentiæ 89160. addita
 ad sinum versum 12538

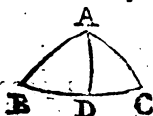
Arcus differentiæ BD, compo-
 nit sinum versum 102698

Quæsti lateris BC, 101698

Et quia hic sinus versus est maior sinu toto, in-
 de colligitur arcum BC, esse maiorem quadrante
 nempe grad. 90 & min. 58. Dempto enim
 sinu toto ex inuento sinu verso 101698. rema-
 net sinus 1698. arcus min. 58. Et sic cum gra-
 dibus 90. facit arcum BC. gr. 90. minut. 58.
 respondentem sinui verso 101698. vt constat ex
 Canone sinuum versorum.

Quando latera sunt æqualia, & proinde nulla
 eorundem differentia, tunc quartus numerus
 posterioris regulæ trium erit sinus versus arcus
 BC.

Vel certè ex angulo dato A, demittatur in
 Basim arcus perpendicularis. Ericque in re-



ctangulo DAB, data basis AB
 vnà cum angulo DAB, cum
 sit medietas totius BAC dati
 Ergo per octauum problema
 sphericorum, dabitur quoque

latus

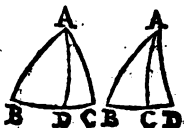
latus oppositum DB , & hoc duplicatum totam
basim BC .

Reliqui duo Anguli B, C .

Possunt elici ex tribus lateribus iam cogni-
tis, ut in problemate præcedenti.

PROBL. XXIII.

*Datis in triangulo spherico obliquan-
gulo duobus angulis cum latere ipsis
adiacente : reliqua duo latera cum
cum reliquo angulo peruestigare.*



Hoc, & duo sequen-
tia problemata redu-
cuntur ad triangula rectan-
gula, per arcum perpendi-
cularem, ut sequitur. In
triangulo ABC dati sint duo anguli, C, BAC ,
cum latere adiacente AB . sintque primò hi duo
anguli inæquales, & latus AB , non quadrans.
Ex altero angulorum demittatur in latus oppo-
situm perpendicularis AD , siue cadat intra trian-
gulum, siue extra. Hac enim ratione dabitur in
triangulo rectangulo ADB basis AB , cum angu-
lo B ; & idè per 8. problem. dabitur perpendi-
cularis AD . & per 9. problem. latus BD . & per
4. angulus C . perque 3. alter angulus non re-
ctus DAB . qui si minor fuerit angulo BAC , ca-
det perpendicularis AD intra triangulum, si
maior extra. Detracto igitur angulo DAB , ex
 BAC , vel hic ex illo, notus fiet etiam angulus

CAD ,

CAD, in triangulo rectangulo ADC. Est autem iam etiam notum latus AD. ergo per 13. probl. dabitur quoque basis AD, & per 17. latus CD. & cadente perpendiculari intra triangulū summa laterum DB, DC, notum efficiet totum latus BC. cadente verò extra; latus CD, subtractum ex DB, relinquet similiter notum tertium latus BC.

Quod si contingat angulum DAC, esse rectum, cum etiam ADC sit rectus, erunt CA, CD, quadrantes, & latus AD, inuentum erit arcus anguli C.

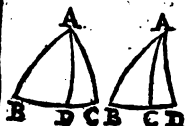
Secundò, latus AB, datum, & adiacens datis angulis inæqualibus C, BAC. sit quadrans; erit igitur in triangulo ABD saltem alterum reliquorum laterum quadrans. non AD, quia angulus B, esset rectus cōtra hypothesin; ergo BD, idèdque angulus BAD. erit rectus, & B, polus erit arcus AD. & AD, arcus anguli B. Et idcirco notus. Quibus ita inuentis reperientur reliqua, ut prius.

Tertiò denique in priori triangulo ABC sit datum latus BC, & anguli dati BC, sint æquales. Demissus ergo ex angulo A, arcus perpendicularis, diuidet tam latus BC, quàm angulum A, bifariam; ac propterea cum in triangulo rectangulo ABD, latus BD, datum sit cum angulo B; reperietur per probl. 13. basis AB, & consequenter AC. & per 4. angulus DAB, & ex his totum latus BC, & totus angulus BAC.

PROBLEM. XXIV.

Datis in Triangulo sphaerico obliquangulo duobus angulis, cum lateri alteri eorum opposito; reliqua latera, cum reliquo angulo explorare.

Si modo constet species alterius lateris alteri dato angulo oppositi.



IN Triangulo ABC, dati sint primum duo anguli B, C, inaequales, cum arcu AB, non quadrante, & species arcus AC. Ex tertio angulo A demittatur ad BC, arcus perpendicularis AD, qui intra triangulum cadet, si uterque angulorum B, C. acutus est, aut obtusus; extra verò si vnus acutus, alter obtusus.

Com ergo in triangulo rectangulo ABD, data sit basis AB, cum angulo B; dabitur per 8. problem. latus AD; per 9. latus BD, & per 3. angulus BAD.

Rursus quia in triangulo rectangulo ACD, datur latus AD cum angulo C, opposito; & species basis AC; dabitur per problem. 14. basis AC; per 10. latus CD. & per 5. angulus DAC.

Si igitur inuentus angulus DAC, inuento DAB, addatur, vel dematur; notus fiet angulus

BAC,

ABC, & similiter lateri CB, lateri BD, additum, vel detractum, notum, efficit latus BC,

Quod si accadat; latus AC, esse quadrantem, erit quoque CD quadrans, & DAC. rectus, &c.

Secundò, datum latus AB, sit quadrans, & adhuc duo anguli B, C, inæquales. Erit igitur BD quadrans, & angulus DAB, rectus; & AC, arcus anguli B, &c.

Tertiò denique in priori triangulo sint duo anguli B, C, æquales. Eruntque propterea & latera AB, AC æqualia & data. Demisso autem arcu perpendiculari AD, (qui & arcum BC, & angulum BAC, secat bifariam) cum in triangulo rectangulo ABD, detur basis AB; cum angulo B, dabitur per problem. 9. latus BD, ideòque & eius duplum BC; & per problem. 3. dabitur angulus DAB, ideòque totus BAC.

PROBL. XXV.

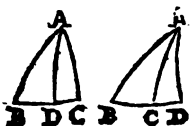
Datis in triangulo spherico obliquangulo duobus lateribus, cum angulo alteri eorum opposito; reliquos angulos, cum reliquo latere inuenire.

Si modo constet species alterius anguli alteri lateri oppositi.

IN triangulo ABC, sint primum duo latera AB, AC, inæqualia, & neutrum quadrans cum angulo B, & specie alterius anguli C.

Dimit-

Dimittatur ex tertio angulo arcus perpendicularis AD, qui intra triangulum cadit, si uterque angulus B, C, est acutus, vel obtusus; extra si unus acutus, alter obtusus.



Et quoniam in rectangulo ADB, datur basis AB, cum angulo B, dabitur per problema 8. latus AD; per 9. latus BD: & per 3. angulus BAD.

Rursus, quia in rectangulo ADC, data est basis AC, cum latere AD; dabitur per probl. 6. latus CD: per 1. angulus C, & per 2. angulus DAC.

Si igitur arcus AD, intra triangulum existit, dabunt anguli DAB, DAC, totum BAC: & latera DB, DC, totum latus BC. Si verò perpendicularis AD, cadit extra, angulus DAC, subtractus ex DAB, relinquit BAC: & latus DC, ablatum ex DB, relinquet latus BC.

Secundò. Alterum laterum, y.g. AB, sit quadrans, erit ergo etiam DB, quadrans, & angulus DAB, rectus, & AD, arcus anguli B, ideòq. notus, &c.

Si verò AC, quadrans est, erit & CD quadrans, & angulus DAC rectus, & AD arcus anguli C. & proinde inuentus arcus AD, notum exhibebit angulum C, &c.

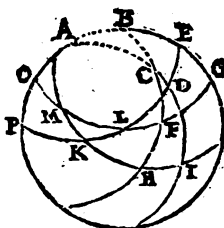
Tertiò denique in priori triangulo data duo latera AB, AC sunt æqualia: eruntque propterea, & anguli B, C æquales, & C, notus ex B. Solum ergo latus BC, erit inquirendum cum

angu-

angulo BAC . In hac enim hypothesi, arcus perpendicularis AD , diuidit latus EC . & angulum BAC , bifariam: & in triangulo ADB , cum data sit basis AB , cum angulo B ; dabitur per 9. problem. latus BD , ideòque & BC . & per problem. 3. inuenitur angulus DAB , eiusque duplus BAC .

*Triangulorum Sphæricorum
permutatio.*

Res est ingeniosa simul & curiosa, cuius omnes casus prosequutus sum alibi describendo Triangula sphærica per modum Astrolabij: hic autem ut rem non planè necessariam, non penitus omittere volui, sed ita proponere, ut proponitur à Pitisco, saltè in vno casu.



In triangulo sphærico ABC , maximus angulus sit B . & ex polis A, B, C . descripti sint tres circuli maximi ELP , ex A : GLO ex B : IKM , ex C . se mutuo secantes in L, M, K , eritque L , polus arcus ABG ; M , polus arcus BCH ; &

K . polus arcus ACI , & LE, LG : item KD, KI ; nec non MF, MH , erunt quadrantes. Vnde efficitur, ut abiecto communi arcu LD , ex duobus quadrantibus KD, LE , remaneat arcus KL

aqua-

æqualis arcui DE, qui est mēſura anguli BAC; & abiecto communi arcu KH. ex duobus quadrantibus MH, KI. remaneat arcus MK, æqualis arcus HI, qui metitur angulū HCI. ſeu ACB, & abiecto denique arcu LF, ex duobus quadrantibus MF, LG, remaneat arcus ML æqualis arcui FG, qui metitur angulū CBE, cuius cōplementum ad duos rectos eſt angulus ABC. Atque ita permutatum eſt triangulum ABC, in triangulum MKL. Latera enim KM, ML, meſurant angulos C, A, & ML. eſt complementum anguli B, ad duos rectos.

Pari ratione demonſtratur trianguli ABC. latera eſſe arcus angulorum trianguli MkL, latus AC æquale, arcui DI, mēſuræ anguli DKI, complementi anguli MkL, ad duos rectos. Latus AB, arcui OP, mēſuræ anguli MKL. Latus denique BC, arcui FH, mēſuræ anguli LMK, ſunt enim quadrantes AE, BC, & ablato communi arcu BE, remanet AB, æqualis arcui EG. Item ablato communi CD, ex quadrantibus AD, CI. remanet AC, æqualis DI, nec non ablato communi CE, ex quadrantibus BF, CH remanent æquales arcus BC, EN.

Porò arcum MI, eſſe complem. anguli ABC, ad duos rectos oſtendi poteſt etiam hoc modo. Duo enim quadrantes IO : MF. ſimul cōficiunt ſemicirculum; eſtque iſtis communis arcus ML; ergo arcus ML; vna cum toto arcu OF. complet ſemicirculum. Arcus autem OF, eſt mēſura anguli ABC, & anguli ABC, complementum ad duos rectos eſt CBE. ergo arcus MI, eſt mēſura complementi anguli ABC, ad

duos

duos rectos. Atque hic modus arguendi habet
vsum, quando in triangulo ABC, etiam angu-
lus A, vel C, est obtusus.

De Prosthaphæresi.

Per Prosthaphæresin dicuntur solui proble-
mata triangulorum, quando sine multipli-
catione, diuisioneque soluuntur per solam ad-
ditionem, & subtractionem, id quod fieri pos-
se demonstratum est tum ab alijs, tum à Cleuio
ad finem primi libri Astrolabij. Neque dubium
est huius generis compendia, esse in vso sinum
perutilia, præsertim quando sinus totus occupat
primum locum in regula trium: in alijs tamen
casibus vix videtur esse operæpretium multipli-
cationes consuetas deferere, præsertim quando
in præceptu sunt virgulæ, seu regulæ Nepperianæ
hoc est, tabula Pythagorica mobilis, maximo
Arithmeticæ practicæ commodo suas in co-
lumnellas distincta.

Loco autem illus Prosthaphæreseos, quæ ab
alijs traditur, placet hic saltem obiter insinua-
re aliam per sinus versos, quæ licet non sit bre-
uior consuetæ, est tamen vnica regula simplex.
Sed prius ponendum est per modum Lemmatis
illud, cui veluti fundamento innititur.

L E M M A.

Sinus totus ad sinum cuiusvis alterius arcus, eā habet rationem. quā sinus cuiusvis alterius arcus ad semissem differentię inter sinum versum differentię eorundem arcuum: vel certē ad semissem sinus versi aggregati, quando arcus dati sunt æquales.

Sit primò uterque arcus AB, AC quadrans: eritque differentia nulla, & aggregatum erit semicirculus, cuius sinus versus est diameter



BD, & semissis huius sinus versi est semidiameter EB. Atque ita in hoc casu, proportio est æqualitatis; quia ut sinus totus EB, ad EB sinum quadrantis, ita est EB, sinus alterius quadrantis ad EB, semissem sinus versi BD.

Secundò sit AF, minor. quadrans, & AD quadrans. Ductis igitur perpendicularibus FG, FI, erit

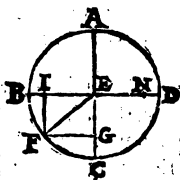


FG, Sinus arcus AF: EA sinus rectus quadrantis AD, equalis sinui toti EF: ID, sinus versus arcus DF, cōposita ex AF, AD; & BI sinus versus arcus BF, quo quadrans AB, superat arcum AF: Denique sumpta DN, æquali ipsi BI; Erit BN, æqualis ID. & IN erit differentia sinuum versorum BN, BI, eiusque semissis erit EI: quia BI, DN, æquales, demptæ ex æqualibus EB, ED, relinquūt æquales FI, EN. Et quia triangula EFG, EFI, sunt æquiangula, manifestum est sinum totum EF, ad FG, sinum arcus AF,

habe-

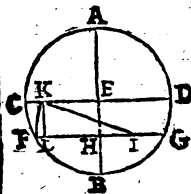
habere eandem rationem, quam habet EF : finus quadrantis ad EI, semissem differentie finuum versorum aggregati arcuum datorum, & differentie eorundem.

Tertiò fit AF, maior quadrante, & AD, sit iterum quadrans. Ductis igitur perpendicularibus FG, FI, erit FG finus arcus AF, & finus quadrantis erit iterum finus totus, EA, vel EF. Recta verò ID, erit finus versus aggregati DAF, idem cum sinu verso reliqui arcus DCF: & BI, erit finus versus arcus BF, differentie inter arcum AF, & quadrantem AB. & si huic BI sumatur æqualis DN, fit recta



EN, æqualis sinui verso ID, & IN, efficitur differentia finuum versorum BN, BI, & BI, fit iterum semissem eiusdem differentie finuum versorum. Dimptis enim BI, DN, ex æqualibus EB, ED, remanent æquales EI, EN,

& EI finus rectus quadrantis ad hanc semissem EI, habet rursus eandem rationem, quam habet finus totus EF, ad FG sinum rectum arcus AF.



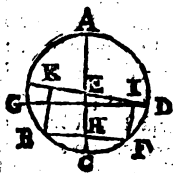
Quartò. Vterque arcus datus sit minor quadrante, unus AE, alter KL, sintque æquales, & diameter HEK sit perpendicularis ad EF, hoc enim pectus secabit eandem EF, rectam BL, bifariam, & ad angulos rectos

in O, Ablato enim arcu BF, ex quadrantibus FH, AB. relinquitur BH æqualis AF; & quia eidem AF æqualis est KL. sequitur ut etiam KL, HB, sint æquales, atque adeò reliqui FL, FB, &c. Quare si ex L, O, in BD, cadant perpendiculares LP, OI; Secta erit etiam BP. bifariam in I. & DE erit sinus versus arcus DL, qui est æqualis aggregato datorum, quia DH. est æqualis ipsi AF. eo quod sublato arcu AK, ex quadrantibus KF, AD, remaneant dicti arcus AF, KD. Sinus autem differentia est nullus, quia inter arcus datos differentia similiter est nulla; & consequenter nulla est differentia sinuum versorum: erit tamen recta EI. semis-sis sinus versi DP, eo quod tota BD sit dupla totius BE. & ablata BP, ablata BI. atque ita reliqua DP, debet esse dupla reliquæ EI, ad quā BD sinus arcus KL. eam habet rationē quā EF, sinus totus habet ad FG, sinū rectū arcus AF, propter similitudinē triangulorū EOI, EFG, &c.

Quintò. Quod si arcus dati sint æquales, & quadrante maiores, sumantur eorum loco eorundem complementa ad semicirculum. Ho-

rum enim complementorum sinus, immo etiā sinus tam aggregati, quàm differentia, si qua foret, sunt iidem, ut videre est in ista figura, in qua arcus AB, AD, sunt maiores quadrante, & inæquales, ex quorum terminalis B, D, in dia-

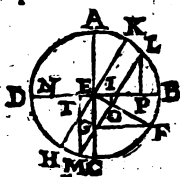
metrum ABC, demissæ sunt perpendiculares



L

BHF,

BHF, DHG . & quidem BH , est finus tam arcus AB , quàm BC, & DH, finus vtriusque arcus AD, CD. Item ND, quam ex DEN , abscindit perpendicularis BN , est finus versus totius arcus BAD, compositi ex duobus arcibus AB, AD . Eademque ND. Est finus versus arcus BCD , qui componitur ex duobus arcibus CB, CD, qui sunt complementa arcuum AB, AD , ad semicirculum . Denique recta DI, quâ abscindit perpendicularis FI , est finus versus arcus FI, vel BG, qui sunt æquales propter parallelas DG , BF , & FD , est differentia inter duos arcus CF, CD , hoc est , inter duo dicta complementa CB, CD, & BG. est differentia inter arcus AB , & AG, quorum iste est æqualis arcui AD.



Sextò . Sit arcus AF , maior quadrante , & ducta semidiametro EF , erigatur ad ipsâ diametrem perpendicularis HEK . & arcus KL , HM , minores quadrante sint æquales alteri arcui dato. Iuncta igitur

ML. secabitur à semidiametro EF, bifariam & ad angulos rectos, in O , eritque EO, finus rectus arcus KL, vel HM, & FG, perpendicularis ad diametrum AC, erit finus rectus arcus AF, & demissis in diametrum BD, tribus perpendicularibus LP, MT , OI ; erit etiâ TP, secta bifaria Arcus porro DAL, est aggregatum arcuum AF, KL, quia DAK. est æqualis ipsi AF, eo quod AK additus ad quadrantes AD , KB facit æquales arcus DK, AF. & quia LP, est ad BD, per-

DN, sunt iterum duplæ ipsius BT. ergo reliqua
 PN, dupla est reliquæ EL, ad quam recta EO
 sinus arcus KL, rationem habet eandem, quam
 EF, sinus totus ad FG, sinum arcus AF, &c.

Octauo. Casus octauus, in quo arcus dati
 sunt inæquales, & maiores quadrante soluitur
 sicut quintus, reducendo arcus propositos in eo-
 rundem complementa ad semicirculum.

REGULA PRIMA

Prosthaphæreseos.

*Quando terminus Analogiæ data, se-
 cundus, & tertius sunt minores
 sinu toto.*

DVo arcus, qui in tabula sinuum respon-
 dent duobus numeris datis, colligan-
 tur in vnā summam, & minor ex
 maiori subtrahatur: semissis enim differentiz
 sinuum versorum aggregati, & differentiz ar-
 cuum, vel semissis sinus versi aggregati quando
 nulla est differentia, est quartus numerus qua-
 situs.

REGVLA SECVNDA.

*Quando secundus terminus, vel tertius
vel vterque maior est sinu toto
ordinario.*

IN nostris tabulis sinus totus ordinarius
est 100000. extraordinarius vero & accu-
rator potest adsciscere alias quinque ci-
fras, ita vt excrefcere possit ad decem cifras:
& tot figurarum debet esse ad summum secun-
dus & tertius numerus analogiz, vt ex nostris
tabulis erui possint arcus ipsis respondentes, re-
spectu sinus totius accuratoris, cui adscriben-
da sunt tot cifras quot figuris constat maior ter-
minus analogiz datae. Vt exempli gratia, si ter-
mini analogiz sint A. B. C. & maximus B.

A B C
100000. 66000166. 2101873.
1000. 00000.

Constat octo figuris, oportebit loco sinus to-
tus A. 100000. assumere alium sinum totum
octo figurarum 100000000. hoc est tribus cifris
maiores ordinario, & respectu istius sinus to-
tius maioris quare in tabula sinuum arcus re-
spondentes numeris B, C. quales sunt arcus gr.
41. min. 18. respondens sinui B. & arcus gr. 1.
minut. 12. sec. 16. respondens sinui C. si nimi-
rū adhibeatur pars proportionalis, quæ in hisce
regulis prosthaphæreticis non est facile negli-
genda. Inuentis autem arcubus reliqua sunt

[L 3

iuxta

iuxta præcepta primæ regulæ, nisi quod hic quarto numero in hæc præfigendæ sint ad dextram tot cifræ, quot fuere additæ sinui toti ordinario, vt hic factum vides.

Arc. aggr. 42. 26. 16.

Sinus versus 26277508.

Arc. differentia 40. 1 44.

Sinus versus 23502864.

Differ. sinus versu 2774644.

Semissis 1387322.

Quartus proport. 1387322000.

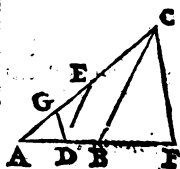
Ita vt quartus proportionalis sit 1387322000.

Cæterum regula trium exhibet eundem accuratius partium 1387239669. Neque enim viturtricis illis, atque ambagibus quibus Prosthapharesis carere via potest. Itavt non immerito multiplicatio regulæ trium additioni subtractionique Prosthaphareseos præferenda videatur. siquidem plus habet pulchritudinis, & curiositatis in speculatione, quam certitudinis in praxi, paucis casibus exceptis. Quando nimirum numeri dati in tabula sinuum reperiuntur præcisè.

Et hoc est, quod me hic paucioribus à Prosthapharesi expodio, quam penitus præcensilem nisi scire ab aliquibus magis fieri. Quos ad Clauium, & alios remitto, qui rem fufius tractant. Clavius ad finē 1. libri Astrolabij rē totā expedit sine finibus versis, neq; sinu totū assumit maiore, sed reliquos potius terminos analogos mulctat aliquot figuris, factique reddit rationē, cuius loco hic libet adscribere aliam, qua nostra regula approbatur, in qua sinui toti aliquot

cifra

cifras præfigimus, & totidem volumus addi numero per Prosthaphereſim inuenito.

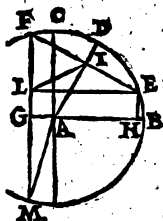


In figura hic appoſita primus terminus analogia, hoc eſt ſinus totus ſit AB, ſecundus AC, tertius AD. Iuncta igitur BC, ductaq. per D, parallela DE, quartus proportionalis eſt AE. Duplicetur exempli gratia ſinus totus, ſitque duplus AF, & rectæ FC, agatur iterum per D, parallela DG, eritq. AG quarta proportionalis ad AF, AC, AD; dico hunc terminum AG, eſſe ſemiſſem AE, prioris, atque adeo tam eſſe multiplicem AE ipſius AG, quam, eſt AF multiplex ſinus totius AB. Cū enim ut AD, ad AB, ita ſit propter parallelas BC, DE, AC, ad AE. & rursus propter parallelas FC, DG, ut AB ad AF, ita ſit AG, ad AC: erit ex æqualitate perturbata, ut AB, ad AF. ita AG, ad AE, hoc eſt ſicut AB eſt medietas AF, ita AG, ipſius AE. Cū igitur per adiectionem, v. g. trium cifrarum ſinus totus AB, multiplicetur per 1000. ſi ipſi AG, præſigantur totidem; erit quoque terminus AG, multiplicatus per 1000. & ideo idem terminus AG, dicto modo multiplicatus erit æqualis ipſi AE.

EP I L O G V S.

Super est, ut hic loco Epilogi aliquid pro approbatione finium tangentium, atque secantium congeramus.

Primum Examen Scimus.



A Pprobatio finuum mutua
ita se habet. In præsen-
ti figura sit arcus BD, graduum
60. DC, 30. & DF, DE, sint
æquales, v. g. Grad. 40. & cō-
sequenter BF, 100. BE, 20.
Sitque FG, sinus arcus BF, &
EH, sinus arcus BE, & diffe-
rentia horum finuum sit FL,
quam abscindit ex FG, perpē-
dicularis EL, dico hanc differentiā FL æqua-
lem esse finui arcus DF, vel DE, hoc est, æqua-
lem ipsi IF, vel IE, quæ sunt semisses chordæ
BF, arcus autem DE, DF, sunt differentie
qua arcus BF, BE, differunt ab arcu BD. grad.
60. Porro arcus FBM, duplus est arcus FB, &
ablatus FE, duplus ablati FD. Reliquus igitur
EM, duplus est reliqui BD, hoc est. arcus EBM,
est duplus arcus BD, grad. 60. & idēd angulus
MFE, arcui BM, insitens erit grad. 60. hoc est
angulus trianguli æquilateri, & angulus FEL,
erit grad. 30. cui æqualis est ILB, quia I,
est centrum semicirculi, in quo existit angulus
rectus FLE. Angulis autem LEL, ILB, est

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qualis LIF, ergo etiam angulus FIL, est gr. 60. & ita in triangulo FIL, sunt duo anguli anguli æquilateri F & I. & consequenter tertius etiã angulus FLI, idemque æqualis angulo IL, & latus denique FL, lateri FI æquale.

Quapropter si duo sinus EH, FG, arcuum EB, B, rectè quidem se habent in tabula, sed eorum differentia FL, non est æqualis sinui IF, arcum DF, DE quibus prædicti arcus differunt ab arcu BD, graduum 60. signum est sinum FI, in tabula vitiosum esse. Similiter si FI dematur ex FG, debet remanere EB, & EH, FI, debent æquare FG.

Secundum Examen Sinuum.

Sinus rectus approbatus approbat sinum complementi, & vice versa. Quadrata enim utriusque sinus debent æquari quadrato sinus totius. per 47. primi. Dicti enim, sinus constituunt cum sinu toto, triangulum rectangulum. Si enim lex D, in AB, cadat perpendicularis DB, ipse eris sinus rectus arcus DB, & alterum latus AE. trianguli AED, est æquale alteri perpendiculari DF, quæ est sinus arcus CD, & sinus complementi arcus BD.

compendium. Examinan-
dus sit, exempli gratia,
sinus EH, vel sinus com-
plementi AH, arcus EE.
Assumatur alius arcus BD
major arcu BD, cuius
uterque sinus sit approba-
tus, sintque præterea ap-

probatj sunt arcus DE, qui inter se differunt
arcus BD, BE. Quibus positis sumatur arcus

DE, æqualis DF, ne caturq.
EF, quæ ab AD, secabitur
bifariam, & ad angulos re-
ctos in G. eritque GE' si-
nus rectus arcus DE, & AG.
sinus complementi eiusdem.

A E M H B Ductis autem perpendicu-
laribz. **FL, GM, & BNK, GL,**
erit etiam **FK**, secta bifariam in **L**, & **EK, I H**,
bifariam in **N, M**. Et triangula **A M G, G N B**
erunt similia, quia præter rectos, duo anguli
MAG, MGA, sunt æquales recto **AGE**, hoc est,
duobus **NGA, NGB**, estque **MGA**, communis
ergo reliquus **MAG**, æqualis est reliquo **NGB**,
&c. Et in utroque triangulo proportio omnium
laterum erit nota. Latera enim **MA, MG**, re-
spectu sinus totius **AG**. Sunt sinus angulorum

respe-

respectu finis totius GE. & NG, NE sunt finis eorundem angulorum respectu finis GE. Et quia AG, GE, finis arcus DE sunt dati respectu finis totius AB, vel AD, per regulam trium dabuntur quoque MA, MG, NG, NE, in partibus eiusdem finis totius AB, iuxta quatuor analogias sequentes.

I.

Vt AG.	Ad MA.	Ita AG.	Ad MA,
finis to-	Sinu anguli	finis co-	in partibus
tus.	MGA, hoc	plem. ar-	finis totus
	est ad finem	cus DE.	AB.
	compl. arcus		
	BD.		

II.

Vt AG.	Ad MG.	Ita AG.	Ad MG.
finis to-	finu anguli	finis co-	in partibus
tus.	MAG, hoc	plem. ar-	finis totus
	est ad fin. ar-	cus DE.	AB.
	cus BD.		

III.

Vt EG.	Ad NG.	Ita EG.	Ad NG.
finis to-	Sin. compl.	finis co-	in partibus
tus.	arc. BE.	cus EG.	finis totus
			AB.

IV.

Vt EG.	Ad NE.	Ita EG.	Ad NE.
finis to-	Sinu arcus	finu ar-	in partibus
tus.	BD.	cus DE.	finis totus
			AB.

Computatis autem in hunc modū rectis MA, MG, NG, NE, inuenitur vterque sinus tam arcus BE, quā arcus BF, hoc modo, GN, cui est æqualis tam IK, quā IF, subtrahatur, & addatur ipsi MG, hac enim ratione per subtractionem relinquitur NM. vel EH, & per additionē inuenitur IF, quia LI, est æqualis ipsi GM. Similiter ipsi AM addatur, & subtrahatur NE, vel NK, Per additionē enim habebitur AH. sinus complementi arcus BE, & per subtractionem recta AI. Sinus complementi arcus BF. Atque ita ex approbatis sinibus arcuū BD, DE approbati erunt sinus tam arcus BE, quā arcus BF.

Compendium Primum.

Quando arcus BD, est duplus arcus BE, inuenitur GB, sinus arcus BE hoc modo. AO, sinus complementi arcus dupli BD. subtrahatur ex sinu toto AB, & MB, semissis sinus versæ OB, multiplicetur per sinum totum AB. Productum enim rectangulum ABM. est æquale quadrato BG, quia per 8. sexti BG, est media proportionalis inter AB, BM, eo quod AGB, sit triangulum rectangulum, & GM, perpendicularis in basim AB.

Eandem ob causam quadrato AG, sinus complementi arcus BE æquale est rectangulū BAM,

Compen-

em CF. Sicut igitur per regulam proportionum haberi possunt dictæ secantes, & tangentes ex dictis sinibus, ita possunt eadem examinari per eosdem.

Aliter.

Aliud examen præsertim tangentium dependet ex quadam Prosthaphæresi, qua magna ex parte constituitur Tabula tangentium, & secantibus, parium numero minorum, ut rectè animadvertens omnes earundem tabularum Computista: utrum verò in hac eadem prosthaphæresi agnouerint singulare illud compendium quod hic obiter exposituri sumus, satis ambigo. Expono autem per modum catalogi, non quidem exprimendo singulos arcus in particulari, sed tantum enumerando illos, quorum tangentes in hoc compendio supponuntur: è sinibus calculatæ immèdiatè; & numerum illum singulis adscribendo qui tangentes inde erutas numerat. Et arcus quidem primarij sunt tantum 12. primus minorum 8. isq. omnium fecundissimus. ex eius enim utraque tangente eruuntur tangentes 2878 id quod credi facile non potest; quodue ipse non credidissem, nisi

Arcus prim.	Num. Tang.
9. 8	2878
0.24	958
0.40	574
1.12	318
2. 0	190
3.20	142
3.36	158
6. 0	62
10. 0	46
18. 0	30
30. 0	14
45. 0	6
	5376
	5400
	24

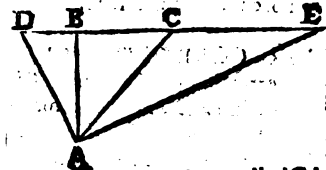
om-

omnes earum arcus in ordinem redegerim, numerumque prædictum, & reliquos tales reperissem, quales hic ponuntur. De quibus in compositione tabularum fufius. Hic verò eam tantum propositionem libet attingere, cui hoc alterum examen nritur, quæ ita se habet.

PROPOSITIO.

Differentia inter secantem, & tangentem cuiusvis arcus, vel anguli, est tangens semissis cõplementi eiusdem. Aggregatum verò eorumdem, componit tangentem dictæ semissis.

Rectæ CD, CE, sint æquales ipsi CA, quæ est secans anguli BAC, & cuius recta BC, est tangens: ita ut differentia inter secantem, & tangentem sit BD tangens anguli BAD, & BE composita ex eadem secante, & tangente sit tangens anguli BAE, quem dico esse complementum anguli BAD, & BAD,



esse semissem anguli ACB, qui est complementum anguli BAC.

Semicirculus enim descriptus centro C, intervallo CA, transit per

A. &

. & ideo angulus DAE est rectus, & BAE complementum ipsius BAD. Angulus quoque BEA duplus est anguli CBA, cui per 8. sexa equalis est BAD, ergo, &c.

Hinc instituetur examen tangentium, hoc modo. Dubia sit Tangens BD, v. g. ex 22, addatur ipsi BE, tangens complementi, & summa DE, dividatur bifariam: eritque altera medietatum CD, altera CE, & utraque æqualis ipsi AC secanti anguli BAC, qui est complementum anguli ACB, cuius semisæ ostendimus esse angulum BAD.

Examen omnibus commune.

Differentia sinuum sensim, non tamen in proportionem continua decrescit. Tangentium vero & secantium differentia notabilius excrescit, multoque magis circa finem; & ideo examen, quod per differentias instituitur, loco est imperfectius. Cum ergo de aliquo numeri tabulæ dubitatur accipiat differentia inter duos numeros antecedentes, & duos consequentes. Hæc enim differentia erit fere eadem & talis quoque debet fere esse differentia inter numerum dubium, & inter numerum proximum maiorem, vel minorem. Laus Deo.

SEQUUNTUR CORRECTIONES.

In quibus omissis erroribus ponuntur Sinus, Tangentes, & Secantes integræ, licet maxima ex parte in una tantum vel altera figura erratum sit. Sic enim consulendum videbatur tum brevitati, tum commoditati.

COR-

CORRECTIONES.

G.	M.	Sinum	Tangensium	Secantium
0	2	58.17763845		
0	7	203.62160535		
0	30			100004
0	60		1746	
1	8	1977.910832		
1	15		2182	
2	43	4739.701399		
2	44			100114
2	45			100115
3	2			100140
4	38		8104	
5	0		8749	
6	0			100551
6	49	11869.28052		
7	30			100863
7	44		13580	
8	0			100983
9	0			101247
11	20	19651.66095		
12	16	21246.19281		
12	34			102454
12	35		22522	
12	56		22964	
13	17	22976.66412		
13	50	23909.84002		
14	20		25552	
14	50	25600.81897		
14	60		26795	
15	33	26807.92004		
17	20			104757
17	51			105057
19	12	32886.66467		

CORRECTIONES.

G. | M. | Sinuum | Tangentium | Secantium

19	30		35411	
21	8		38654	
22	0		40403	
22	17		40979	
23	48	39741.48378		
24	17		45117	
24	30		45573	
24	44			110100
24	45	41865.97375		
25	14			110549
25	34			110854
26	34			111805
26	58		50879	
27	35		52242	
28	22	47511.23698		
28	23	47536.83095		
29	28			114858
29	48			115239
29	52	49798.33153		
30	42		59376	
30	51	51279.22537		
32	0			117918
32	30			118569
32	35	53852.57027		
35	32			122884
36	2			123659
36	21	59271.62583		
36	59	60158.26840		
37	22	60691.35652		
37	34	60968.41252		
38	23	62091.97868		
39	52			130287

CORRECTIONES.

G. M.		Sinuum	Tangensium	Secantium
40	46	68298.00915		
41	18		87852	
41	46	66609.86571		
41	6	66696.60577		
42	60	68199.83600		
43	5			136919
43	37	68983.01676		
44	0		96569	
44	16	69799.87941		
44	44		96652	
45	0			142421
45	17			142126
45	34		101968	
46	18			143869
46	21	72356.97791		
46	22	72377.05345		
47	49	74099.99605		
48	16			150226
48	27		112831	
49	6	75585.34691		
49	30			153977
49	43	76285.64409		
50	0		119175	
50	1		119246	
50	2		119316	
50	3		119387	
50	4		119457	
50	5		119528	
50	6		119599	
50	7		119669	
50	8		119740	
50	9		119811	

CORRECTIONES.

M		Sinus	Tangens	Secans
10			119881	
11			119953	
14				156332
16	78006:66528			
18			129385	
20			130323	164268
9				166744
44			136300	
52	80764.69666			
15				171150
44			141409	
60				174349
11				175146
50				178062
0	82903.75725			
59			153888	
8				187661
60	84804.80961			
30	85264.01643			
40				192302
41				192394
60				194160
2				200202
30				
32				203286
52			179419	
60			180405	
24			183313	
30				209174
31	87895.58753			
60			188073	
55			195557	

CORRECTIONES.

C		M	Sinuum	Tangentium	Vocationum
62	10		9074.22524		
63	11		89245.46257		
63	12		89258.58184		
63	21		89376.31529		
63	45		89687.27415		
64	32				232566
65	7		90716.64502		
66	32				251120
67	7			236925	
67	60			247509	
68	10		92826.96167	249597	
68	13				269471
68	24				271647
68	57		93326.73360		
69	3		93389.28060		
69	34		93707.90398		
69	39		93758.58190		
70	35		94312.25996		
71	18		94721.02777		
71	24			297144	
71	29		94823.13149		
71	30			298868	
74	8		96158.17637		
75	15		96704.59389		
75	23		3830155	383449	
75	25			384364	
75	36			389474	
75	58		97045.58176		
76	44				435768
76	47				434388
76	50		97371.15872		
78	29		97986.66693		

CORRECTIONES.

M.		Sinum	Tangentium	Secantium
9	38			555720
0	27		594389	
0	28			603788
0	56	98750.56522		
I	30			678547
I	31			677866
I	32		671789	
I	37			685893
I	42			692731
I	44		688278	
I	46		691104	698301
I	47		692525	
I	58		708546	
2	0	99026.80687		
2	11	99070.83204		
2	12			
2	60			820551
3	30		877689	
3	0		851436	
3	6	99470.28171		
3	32	99045.17907		
3	51	99848.90974		
3	7	99888.98749		
8	22	99894.40096		
8	25		2216398	
8	33			2339361
8	8		3242129	
8	35		13750745	
8	36		14323712	
8	37		14946502	
8	38		15625908	
8	45		22918166	

A V S D E O.



