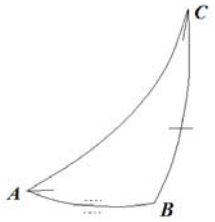
CHAPTER IIII.

Concerning the measurement of oblique angled triangles.

PROBLEM 1.

With two angles given and with a side opposite to either of the given, to find the side opposite the remaining angle.

In the oblique angled triangle ACB, the side AB is sought.



Given { the angles { BAC 103 999307; Compl. 76 000693
ACB 36 131235
with the side CB 42 146646.

The terms of the ratio.

Proportions {
Sine of the angle of the opposite side given.
Sine of the side given.
Sine angle remaining.
Sine of the side sought, by Cons.3, Ch.2.

Illustrated numerically.

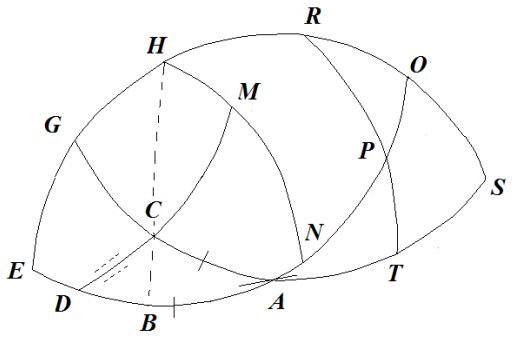
				Sine		*Log.Sin.*
Proport.	Sine Angle	CAB	76 000693	97029,86512	. .	9,98690,54277
	Sine side	CB	42 146646	67103,04563	. .	9,82674,22302
	Sine Angle	ACB	36 131235	58963,67471	. .	9,77058,45404
						19,59732,67707
	Sine of the side AB		24 065185	40777,57122	. .	9,61042,13430

With two of the sides found together with one of the angles opposite to the same, also the remaining side evidently can be found in this manner.

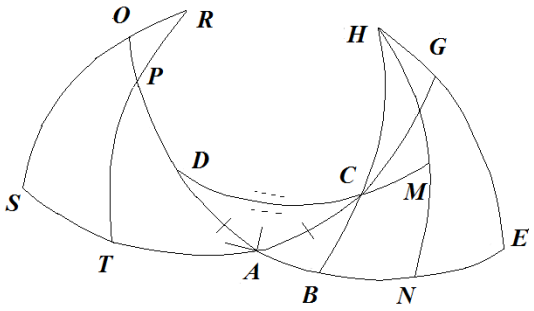
		Sin & Tang.	*Log.Sin & Tang.*
Proport.	Sine of half the difference of the angles	33 934036	9,74681,94465
	Sine of half the sum of the angles	70 065271	9,97316,55681
	Tangent of half the difference of the sides	9 040731	9,20170,63309
			19,17487,18990
	Tangent of half the remaining side	15 00000	9,42805,24525

PROBLEM 2.

With two sides given and with the angle determined by the same, the remaining side is sought.



For this and for the solution of almost all the subsequent problems, for which two operations are required, the oblique angled triangle is required to be reduced into two right angled triangles, clearly with the help of a perpendicular drawn from the end of a known side and wherever it shall meet the side sought, or opposite to the angle sought. Thus in the triangles with these right angles the parts of which correspond in similar places, if the individual parts are known, also the individual parts of the oblique angled triangle will not remain hidden. Truly from these properly understood, which we have set out in the third chapter, the individual parts of these will be able to be sought out without difficulty ; indeed with the perpendicular together with the radius excluded, as we have established in *Consequences 4, 5, 6, & 7* of the second chapter; The sines or tangents of the mean parts of one triangle and the extreme parts of the other, will be the mean proportionals between the sines or tangents of the remaining mean part and the extreme part of the first triangle. So with our greater understanding, we may proceed to demonstrate the resolution of the following problems one by one. Truly because by sending the perpendicular from the angle to the vertical, whether it falls within or outside the triangle, according as the angles to the base shall be of the same or of different kinds, therefore so that no calculation may be held up by difficulties, we have put in place two diagrams with the same letters assigned, so that the terms of the ratio may be used for each in turn to be illustrated arithmetically.



In the oblique angled ACD the side DC is sought.

			1.*Upper diag.*	2.*Lower diag.*
Given	the sides	AD	42 14646	24 065185
		AC	30 000	30 000
	with the angle	DAC	36 131235	103 999307

This problem and some of the following as I have said, need a two-fold undertaking, the first of which serves to find the base segments, or the angles to the vertical ; the other truly for finding the angles or the sides required.

Terms of the Ratio.

I. For a segment of the base. *By Prob.* 6, *Ch.* 3.

Proport. { *As the Radius*,
To the Tangent of the Hypotenuse.
So the Sine of the Complement of the contained angle,
To the Tangent of the segment opposite the contained base angle.

And thence the remaining segment.

II. For the side sought. *By Conseq.* 5.

Proport. { *As the Sine of the Complement of the Base finally found*,
To the Sine of the Complement of the Hypotenuse;
So the Sine of the Complement of the remaining segment of the base,
To the Sine of the Complement of the side sought.

Illustrated by numbers,

I.

Proport.		*Sin. & Tang.*	*Logs. Sin. & Tang.*
	As the Radius . . . . . .RS	90 0000	. 100000,00000 . 10,00000,00000
	To the Tan. Hypotenuse TS=AC	30 0000	. 57735,02692 . . 9,76143,93726
	So the Sin. compl.OS viz . RO	53 868765	. 80766,85560 . . 9,90723,31753
	To Tan.segm.Base OP=AB	25 0000	. 46630,76582 19,66876,25479
	Of which the compl. is PA=BE	65 0000.	

We are able thus also to establish the terms of the ratio for the segments of the base or of the vertical angles, without the quadrant RST.

Proport. { *As Sine of the compl. of the angle given*
To the Tang. compl. of the Hypot.
So the Radius
To the Tang. of the compl. base segment opp. given angle.

Illustrated by numbers.

I.

			Sin.&Tang.	*Logar.Sin.&Tang.*
Proport.	As Sin.compl. EG viz . HG	53 868765	. 80766,86698	. . 9,90723,31753
	To Tang. compl. AC viz . GC	60 0000	. 173205,08076	. . 10,23856,06274
	So Radius . . . . HE	90 0000	. 100000,00000	. . 10,00000,00000
	ToTang. compl. AB viz . EB	65 0000	. 214450,69205	. . 10,33132,74521
	Therefore segm. AB is	25 0000		

II.

			Sinus.	*Logar.Sin.*
Proport.	As Sine compl. AB viz . BE	65 0000	. 90630,77870	. . 9,95727,57115
	To Sine compl. AC viz . CG	60 0000	. 86602,54037	. . 9,93753,06317
	So Sine compl. DB viz . BN	72 853354	. 95555,33089	. . 9,98025,49202
				19,91778,55519
	To Sine compl. DC viz . CM	65 934815	. 91308,21216.	. 9,96050,98408
	Therefore DC is	24 065185 , the side sought.		

But if the angle assumed shall be obtuse, just as can be seen in the triangle ACD of the lower diagram ACD, the problem is to be worked out in the same manner. The data presented already may be retained.

I.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . . . . RS	90 0000	. 100000,00000	. . 10,00000,00000
	Tang. of Hypotenuse ST=AC	30 0000	. 57735,02692	. . 9,76143,93726
	Sin.compl. OS viz. RO	13 999307	. 24191,01595	. . 9,38365,41009
	Tang.segment.Base OP=AB	7 950891	. 12966,68969	. 9,14509,34735
Of which the Complement is	BE	82 049109.		

II.

			Sine	*Log.Sin.*
Proport.	Sine compl. AB viz. BE	82 049109	. 99038,69909 . .	9,99580,49270
	Sine compl. AC viz. CG	60 0000	. 86602,54037 . .	9,93753,06317
	Sines compl. DB viz. BN	57 983930	. 84789,94309 . .	9,92834,43146
				19,86587,49463
	Sine compl. DC viz. CM	47 853354	. 74142,97807 . .	9,87007,00193
	Therefore DC is	42 146646 , the side sought.		

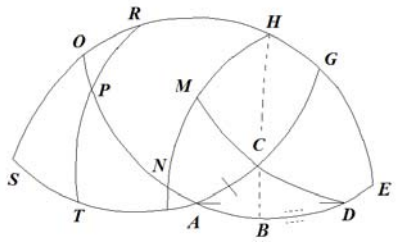
PROBLEM 3.

With two angles given and with a side opposite to either angle given, the side held by the same is sought.

In the oblique angled triangle ADC the side AD is sought

1.*Upper diagram.* 2.*Lower diagram.*

Given	the angles	CDA	36 131235	103 999307
		CAD	46 302020	36 131345
	with the side AC		24 065185	42 146646



Terms of the ratio .

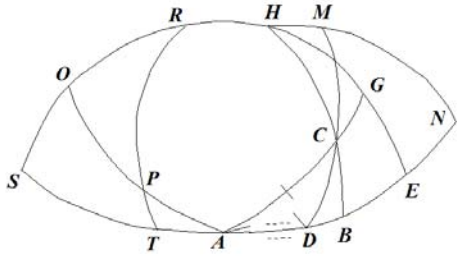
I. For a segment or the base, *by Problem.*6. *Cap.*3.

Proport.
- *Radius.*
- *Tangent of the Hypotenuse or of the side.*
- *Sine of the complement of the angle opposite the Hypotenuse.*
- *Tangent of the base segment opposite the Hypotenese.*

II. For the remaining segment of the base.

*By Conseq.*6.

- *Tangent of the angle of the side given opposite.*
- *Sine of the segment of the base given opposite.*
- *Tangent of the remaining angle.*
- *Sine of the remaining segment of the Base.*



If the perpendicular falls within, the side sought is the sum of the segments, if it falls without, it is the difference of these.

Illustrated by numbers.

I.

1.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . . . RS	90 0000	. 100000,00000	. . 10,00000,00000
	Tang. Hypot. ST=AC	24 065185	. 44659,25969	. . 9,64991,15077
	Sin.compl. OS viz.OR	43 697980	. 69085,69203	. . 9,83938,81107
	Tang.segment. OP=AB	17 146646	. 30853,15726	. . 19,48929,96184
	The Complem. is BE	82 049109		

II.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Tang. angle at D viz. NM	36 131235	. 73004,79176	. . 9,86335,13634
	Sine of segmen AB	17 146646	. 29481,83629	. . 9,46955,45148
	Tang.angle at D viz. GE	46 302020	. 104651,41007	. . 10,01974,50890
				19,48929,9603
	Sine of remaining seg. DB	25 000000	. 42261,82617	. . 9,62594,82404
	Segment AB is . . .	17 146646		
	Sum of segments is AD	42 146646 , the side sought.		

But if the angles to the base are of diverse kinds, and hence the perpendicular shall fall outside the base, just as in the diagram of the lower triangle, the manner of operation will be similar to the first, and thus the remaining data may be retained.

I.

2.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . RS	90 0000	. 100000,00000	. 10,00000,00000
	Tang. ST=AC	42 146646	. 90504,92470	. . 9,95667,22064
	Sin.compl. SO viz.OR	53 868765	. 80766,85559	. . 9,90723,31753
	Tang.segment. OP=AB	36 166052	. 73097,96633	. 19,86390,53817

II.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport. Tang. of ang. at D viz.	NM	76 000693	401098,77321	10,60321,13258
Sine of segment	AB	36 166052	59012,73216	9,46955,45148
Tang.ang. at A viz.	GE	36 131235	73004,79176	9,86335,13634
				19,63429,71653
Sine of remaining seg.	DB	6 166052	10741,02629	9,03104,58385
Segment AB is		36 166052		
Sum of segments is	AD	30 000000 , the side sought.		

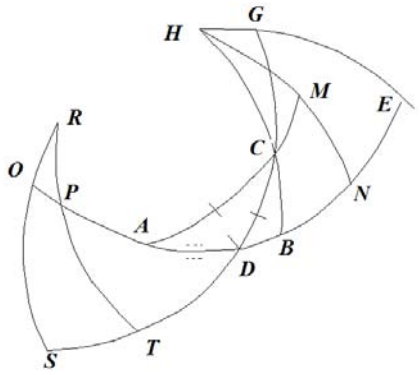
PROBLEM 4.

With two sides given and with one of the opposite angles given, the remaining side is sought.

In the oblique angled triangle ADC the side AD is sought

1.*Upper diagram.* 2.*Lower diagram.*

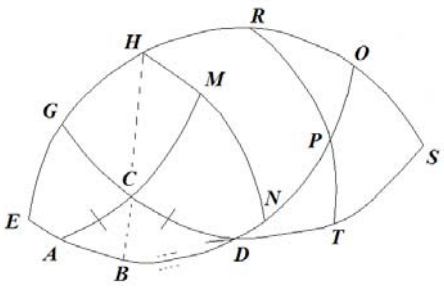
Given	The sides	DC	30 000000	24 065185
		AC	24 065185	137 853354
	The angle ADC		36 131235	103 999307



Terms of the Ratio.

I. For segment of the base, *by Probl.*6, *Cap.*3:

Proport.
- *Radius.*
- *Tangent Hypotenuse to opp.angle given.*
- *Sine of opp.angle given.*
- *Tangent of segment of base opp.angle given.*



II. For the side sought. *By Conseq.*5:

- *Sine compl.of side opp.angle given.*
- *Sine compl.segm. base from opp.angle.*
- *Sine compl. remaining side.*
- *Sinus complem. remaining segment of base.*

If the perpendicular falls within, the sum of segments is the segment sought, but if without, then the difference of the same is the segment sought.

Illustrated by arithmetic.

1.

		I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . RS 90 000000	. 100000,00000	. . 10,00000,00000
	Tangent. Hypot. DC=ST 30 000000	. 57735,06292	. . 9,76143,93726
	Sin.compl. OS viz. RO 53 868765	. 80766,85559	. . 9,90723,31753
	Tang.segment. OP=DB 25 000000	. 46630,76582	. 19,66867,25479

		II.	*Sine.*	*Log.Sin.*
	Sine compl. DC viz. CG	60 000000	. 86602,54037	. . 9,93753,06317
	Sine compl. DB viz. BE	65 000000	. 90630,77870	. . 9,95727,57115
	Sine compl. DB viz. BN	65 934815	. 91308,21216	. . 9,96050,98404
				19,91778,55519
Proport.	Sine compl. AB viz. BN	72 853354	. 95555,33089	. . 9,98025,49202
	Therefore the seg. AB is	17 146646		
	Truly the seg. DB	25 000000		
	Therefore of the segments, the sum is AD	42 146646	, the side sought.	

The exercise for the side of the AD of the triangle from the lower diagram.

2.

		I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . RS 90 000000	. 100000,00000	. . 10,00000,00000
	Tangent. Hypot. DC=ST 24 065185	. 44659,25969	. . 9,64991,15077
	Sin.compl. OS viz. RO 13 999307	. 24191,01595	. . 9,38365,41009
	Tang.segment. OP=DB 6 166050	. 10803,52716	. 19,03356,56086

		II.	*Sine.*	*Log.Sin.*
	Sine compl. DC viz. CG	65 934815	. 91308,21216 .	. 9,96050,98404
	Sine compl. DB viz. BE	83 833947	. 99421,47796 .	. 9,99748,02351
	Sine compl. DB vid. BN	47 853354	. 74142,97807 .	. 9,87007,00249
				19,86755,02600
Proport.	Sine compl. AB viz. BN	53 833956	. 80731,01834 .	. 9,90704,04196
	Therefore seg. is AB	36 166050		
	and seg. DB is	6 166050		
	Therefor of the segments,			
	the sum is AD	30 000000 , the side sought.		

PROBLEM 5.

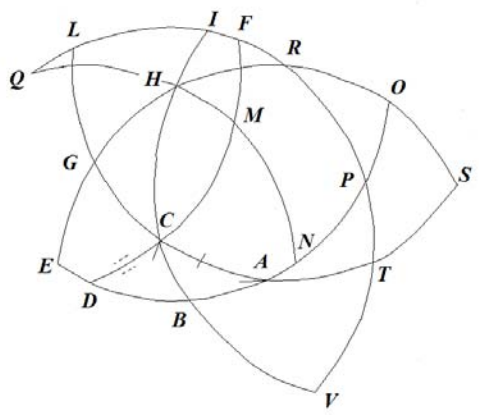
With two angles given with the side included by the same, either side is sought. In the oblique angled triangle ACD, the side DC is sought.

			1.*Upper diagram.*	2.*Lower diagram.*
Given	Angles	DAC	36 131235	36 131235
		ACD	103 999307	46 302020
	with side AC		30 000	42 146646

Terms of the ratio.

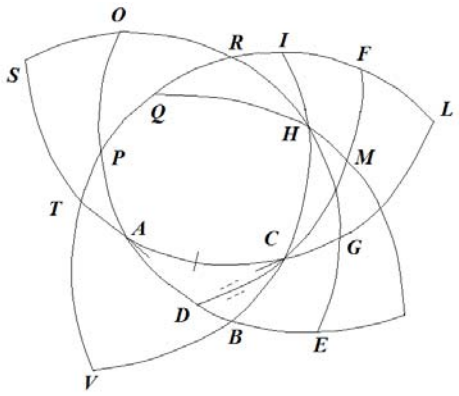
I. For segment of vertical angle, *by Prob.*16:

Proport.
- *Radius.*
- *Tangent of angle to base, or opp. side sought.*
- *Sine compl. Hypotenuse; or of side given.*
- *Tangent compl. segment of angle to vertical.*



II. For the side sought, *by Conseq.7.*

Proport. { *Sine compl. of remaining angle to vertical.*
Tangent of side given.
Sine compl. vertical angle last found.
Tangent of side sought.



Illustrated by numbers.

1.

		I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Pro. Radius	AS 90 000000	100000,00000 .	.10,00000,00000
Tangent of the angle .	CAD viz. SO 36 131235	73004,79176 .	. 9,86335,13634
Sin.compl. of the side .	CA viz. AT 60 000000	86602,54037 .	. 9,93753,06317
Tang.compl. seg. angle vert.	TP viz. TV 32 302713	63224,00405 .	19,80088,19951

Therefore seg. of vert. angle is 57 697287 viz. ACB.

		II.	*Sinus.*	*Logar.Sin.&Tang.*
Proport.	Sine compl. FI viz. QI	43 697980	. 69085,69203 .	. 9,83983,81107
	Tangent of side AC viz. LG	30 000000	. 57735,02692 .	. 9,76134,93726
	Sine complem. LI viz. RI	32 302713	. 53939,23708 .	. 9,72786,02462
				19,48929,96188
	Tang.side.sought FM=DC	24 065185	. 44659,25969 .	9,64991,15081

But if the perpendicular falls without the base, as in the lower diagram ; with the given remaining ; I say

2.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . AS	90 000000	. 100000,00000 .	. 10,00000,00000
	Tangent . . SO	36 131235	. 73004,79176 .	. 9,86335,13634
	Sine . . . AT	47 853350	. 74142,97807 .	. 9,38365,41009
	Tangent . . TP	28 425765	. 54127,92962 .	. 19,73342,13883
	Complem. is TV=IL	61 574345	And thence the angle DCB	15 272215.

		II.	*Sinus.*	*Logar.Sin.*
Proport.	Sine compl. FI viz. QI	74 727785	. 96368,52972 .	. 9,98438,56593
	Tang.of side AC viz. LG	42 146646	. 90504,92470 .	. 9,95607,22854
	Sine compl. LI viz. RI	28 425765	. 47601,97234 .	. 9,67762,49419
				19,63429,71473
	Tang.of side FM=DC	24 065185	. 44659,25969 .	. 9,64991,14880

Also from the same given, the remaining two sides are able to be obtained likewise clearly by the same labour in this manner.

	1.	2.
Angle DAC	36 131235	36 131235
Angle ADC	103 999307	46 303030
Sum of the angles	140 120542	82 433255
half the sum	70 065271	41 216627
Difference of angles	67 868072	10 170785 $\frac{1}{2}$
Half difference	33 934036	5 085392 $\frac{1}{2}$

1. Operation I.

	Arc	*Logs.Sin.&Tang.*
Sine of half the sum of the angles	70 065271	9,97316,55681
Sine of half the difference of the angles	33 934036	9,74681,94465
Tangent of half the included sides	15 000000	9,42805,24525
		19,17487,18990
Tan. $\frac{1}{2}$ difference of the remaining sides	9 040731	9,20170,63309

Operation II.

	Arc	*Logs.Sin.&Tang.*
Sine compl. half sum of the angles	19 934729	9,53268,99540
Sine compl.half difference of the angles	56 065964	9,91891,10459
Tangent of half included side	15 000000	9,42805,24525
		19,34696,34964
Tangent half sum of sides	33 105916	9,81427,35444
Half sum of sides is	33 105916	
of half the difference of the sides is	9 105916	
Sum of the sum & difference of sides is	42 146647	Side AD sought.
Difference of sum and difference of sides	24 065185	Side DC sought.

Similarly with the given numbers of the lower diagram. I say,

2. Operation I.

	Arcs	*Log.Sin.&Tang.*
Sine half sum of angles	41 217728	9,81882,46407
Sine half difference of angles	5 085393	8,94763,13168
Tangent half the side included	21 073323	9,58583,62561
		18,53346,75729
Tang. $\frac{1}{2}$ difference remaining sides	2 967409	8,71464,29322

Operation II.

	Arc	*Logs.Sin.&Tang.*
Sine compl.half sum angles	48 783372	9,87634,70195
Sine compl.half difference angles	84 904607	9,99828,71096
Tangent half of side included	21 073323	9,58583,62562
		19,58412,33658
Tangent half sum of sides	27 032592	9,70777,63463
Half sum of sides is	27 032592	
half difference of sides is	2 967409	
Sum of sum & difference of sides is	30 000001	Side AD sought.
Difference sum & difference sides is	24 065183	Side DC sought.

PROBLEM 6.

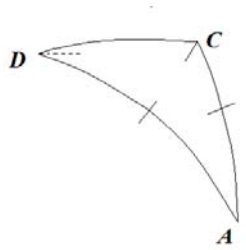
With two sides and with either angle opposite given, th angle opposite the remaining side is sought.

In the oblique angled triangle ACD the angle ADC is sought

Given { sides { AC 30 000000 ; AD 42 144266 } ; with the angle ACD 103 999307 }

Terms of the ratio.

- *Sine of the side opposite to the given angle.*
- *Sine of the given angle dati.*
- *Sine of the remaining side.*
- *Sine of the angle sought*, per Consec.3, Cap.2.



Illustrated by Arithmetic.

				Sines		*Log.Sines.*
Proport.	Sine of side	AD	42 146646	67103,04565	. .	9,82674,22303
	Sine of angle	ACD	76 000693	97029,86513	. .	9,98690,57277
	Sine of side	AC	30 000000	50000,00000	. .	9,69897,00043
						19,68587,57320
	Sine of angle	ADC	46 302021	72299,15012	. .	9,85913,35017

With two angles acquired together with the sides opposite the same, we are able also to come upon the remaining angle in the same manner as we have obtained the remaining side by Problem 1 of this chapter.

PROBLEM 7.

With two angles and the side included by the same, the remaining angle is sought.

In the following oblique angled triangle ACD the angle ADC is sought.

1.*Upper diagram.* 2.*Lower diagram.*

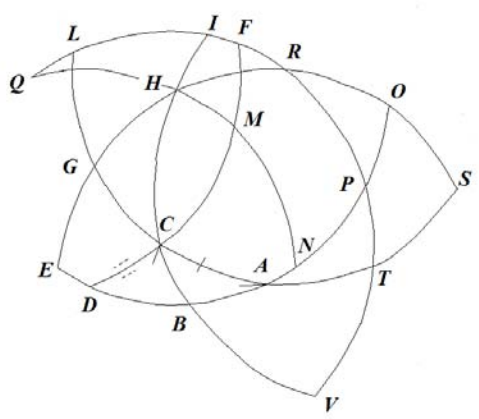
Given	Angles	DAC	103 999307	36 131235	
		DAC	36 131235	46 302020	
	Side	AC	30 000	42 146646	

Terms of the ratio.

I.For the segment of the vertical angle, *Per Probl*.6.

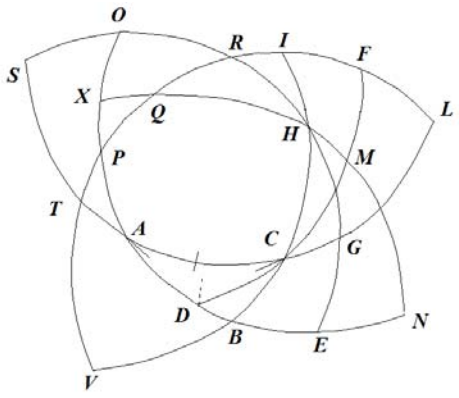
Proport.

- *Radius.*
- *Tangent of the angle to the base.*
- *Sine comp. of given side.*
- *Tangent Comp. of seg. to vertical angle.*



II. For the angle sought. *By Conseq.4.*

Proport. { *Sine* of *seg. of last found angle to vertical.*
Sine of remaining angle to vertical.
Sine compl. of angle to base.
Sine compl. of angle sought.



Illustrated by arithmetic.

1.

		I. *Sin.* & *Tang.*	*Log.Sin.* & *Tang.*
Pro. Radius	AS	90 000000	100000,00000 . 10,00000,00000
Tangent of the angle .	CAD viz. SO	36 131235	73004, 79176 . . 9,86335,13634
Sin.compl. of side . .	CA viz. AT	60 000000	86602,54037 . . 9,93753,06317
Tang.segment. angle vert.	TP viz. TV	32 302713	63224, 00405 . 19,80088,19951

Therefore segment of angle to vert. is 57 697287 viz. ACB.

			II. *Sin.*	*Logar.Sin.*
Pro.	Sine IL	57 697287	. 84523,65276 . .	9,92697,82551
	Tangent angle . . . IF	46 302022	. 72299,15012 . .	9,85913,31911
	Sine compl. EG viz. HG	53 808765	. 80766,85559 . .	9,90723,31753
				19,76636,63664
	Sine compl. MN viz. HM	43 697979	. 69085,69203 . .	9,83938,81113

Therefore the angle AD is 40 302021 the angle sought.

The same exercise is required in the lower diagram.

2.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . . AS	90 000000	. 100000,00000 . .	10,00000,00000
	Tangent . . . SO	46 30201	. 104651,41007 . .	10,01974,50864
	Sin.compl. CA viz. AT	47 853354	. 74142,97807 . .	9,87008,00249
	Tangent TP	37 808484	. 77591,67097 . .	19,88981,51113
	Complement is TV=IL	52 191526		

			II. *Sin.*	*Log.Sin.*
Proport.	Sine IL	52 191516	. 79006,43467 . .	9,89766,24083
	Sine . . . . . IF	16 060281	. 27664,85382 . .	9,44192,83946
	Sine compl. EG viz. HG	43 697979	. 69085,69203 . .	9,83938,81107
				19,28131,65053
	Sine compl. MN viz. HM	13 999307	. 24191,01595 . .	9,38365,40970

With which added to the quadrant HX 90 000000

The arc is completed MX 103 999307, the measure of the angle ADC sought.

PROBLEM 8.

With two sides and one of the opposite angles given, the angle included by the same is sought.

In the oblique angled triangle ADC, the angle ACD is sought.

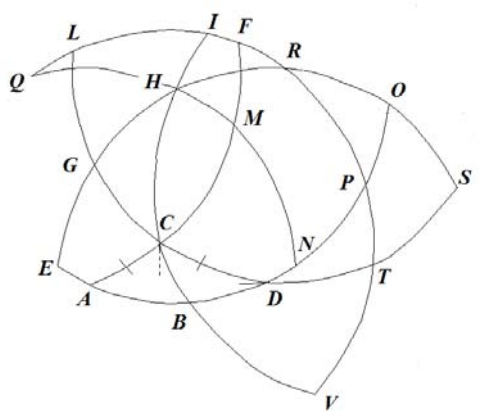
1.*Upper diagram.* 2.*Lower diagram.*

Given	Sides	AC	24 065185	30 000
		CD	30 000	42 146646
	Angle ADC		36 131235	46 302020

Terms of ratio.

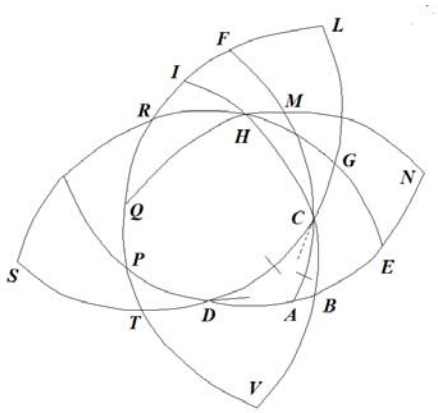
I. For segment of vertical angle, *by Problem* 6.

Proport.
- *Radius.*
- *Tangent of angle given.*
- *Sine complem. of side opp. to angle given.*
- *Tangent Complem. of segment to vert.angle.*



II. For angle sought. *By Conseq.7.*

Proport.
- *Tangent of side opposite to given angle.*
- *Tangent of remaining side.*
- *Sine Comp. of seg. of vert. angle last found.*
- *Sine Compl. of remaining vertical angle.*



If the perpendicular falls within, the sum of the vertical angles is the angle sought; but if it falls without, the difference of the same is the angle sought.

Illustrated by arithmetic.

1.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius	DS 90 000000	. 100000,00000	. . 10,00000,00000
	Tangent	SO 36 131235	. 73004,79176	. . 9,86335,13634
	Sine compl. CD viz.	DT 60 000000	. 86602,54037	. . 9,93753,06317
	Tang.	TP 32 302713	. 63224,00405	. . 19,80088,19951

Complement is TV=LI 57 697287 , measure of the segment of the angle DCB.

			II. *Sine.*	*Log.Sin.&Tang.*
Proport.	Tang. of side AC=FM	24 065185	. 44659,25969	. 9,64991,15077
	Tangent of side DC= LG	30 000000	. 57735,02692	. . 9,76134,93726
	Sine complem. LI viz. IR	32 302713	. 53939,23708	. 9,72786,02462
				19,48929,96188
	Sine compl. IF viz. IQ	43 697980	. 69085,69203	. . 9,83983,81111

Therefore arc is IF 46 302021
And arc first found LI 57 697287
Sum of vertical angles 103 999308, angle sought ACD.

For the triangle of the lower diagram.

2.

I. *Sin.&Tang.* *Log.Sin.&Tang.*

Proport.

Radius	DS	90 000000	. 100000,00000 . .	10,00000,00000
Tangent . . .	SO	46 302021	. 104651,41007 . .	10,01974,50864
Sin.compl. CF viz.	DT	47 853354	. 74142,97807 . .	9,87008,00249
Tangent	TP	37 808484	. 77591,67097 . .	19,88981,51113
Complement is TV=LI		52 191526		

II.

Sin.&Tang. *Log.Sin.&Tang.*

Proport.

Tangent of side AC=FM		30 000000	. 57735,02682 . .	9,76143,93726
Tangent of side DC=LG		42 146646	. 90504,92470 . .	9,95667,22064
Sine complem. LI viz.LR		37 808484	. 61302,45434 . .	9,78747,75192
				19,74414,97256
Sine complem. IF viz. IQ		73 939719	. 96097,10775 . .	9,98271,03530
There the arc is	IF	16 020681		
But the arc found	IL	52 191516		
Difference	FL	36 131235, measure of the angle DCA.		

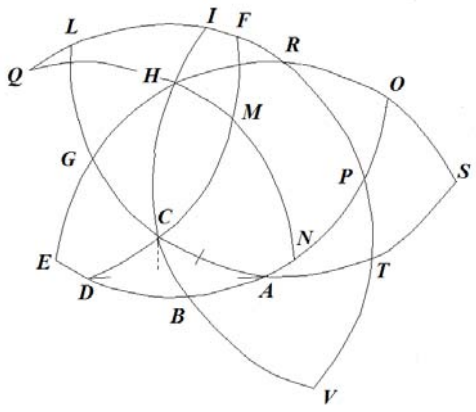
PROBLEM 9

With two angles and with a side opposite one given, the remaining angle is sought.

In the oblique angled triangle ADC, the angle ACD is sought.

1.*Upper diagram.* 2.*Lower diagram.*

Given	Angles	DAC	36 131235	46 302020
		ADC	46 302021	103 999307
	Side	AC	30 000000	42 146646

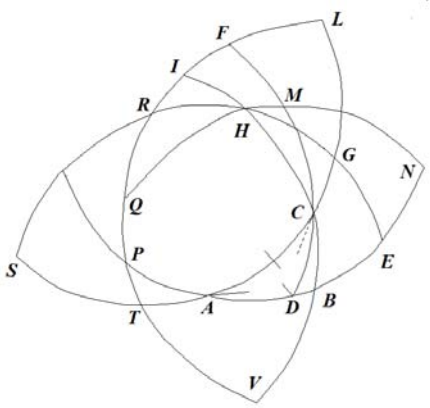


Terms of the ratio.

I. For the segment of the angle to the vertical. *By Problem 6*.

Proport.
- *Radius.*
- *Tangent of the angle opposite to the side given.*
- *Sine comp. of the side opposite to the angle given.*
- *Tangent of the vert. angle of the segment.*

II. For angle sought to the vertical. *By consec. 4.*



Proport.
- *Sine compl. of the angle to the opp. side given.*
- *Sine compl. of the remaining angle given.*
- *Sine of the seg. of the angle to the vertical last found.*
- *Sine of the remaining angle to the vertical.*

If the perpendicular falls within, the sum of the angles to the vertical is the angle sought ; but if it falls beyond, the difference is the angle sought.

Illustrated by arithmetic.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius	AS 90 000000	. 100000,00000 . .	10,00000,00000
	Tangent	SO 36 131235	. 73004,79176 . .	9,86335,13634
	Sine compl. AC viz.	AT 60 000000	. 86602,54037 . .	9,93753,06317
	Tang.	TP 32 302713	. 63224,00405 . .	19,80088,19951

Complement is TV=LI 57 697287 measure of the segment of the angle ACB.

				II. *Sin.*	*Logar.Sin.*
Proport.	Sine compl. EG viz.	HG	53 808765	. 80766,85559 . .	9,90723,31753
	Sine compl. NM viz.	HM	43 697979	. 69085,69203 . .	9,83938,81107
	Sine of vert. angle	IL	57 697287	. 84523,65276 . .	9,92697,82551
					19,76636,63658
	Sine vert. angle left	IF	46 302020	. 72299,15012 . .	9,85913,31905
	Arc IL is		57 697287		
	Sum of arcs is		103 999307, measure of angle sought ACD.		

Working for the angle ACD of the lower diagram.

2.

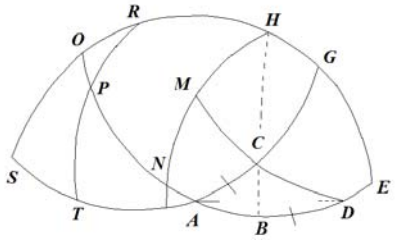
			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius	AS 90 000000	. 100000,00000	. . 10,00000,00000
	Tangens . . .	SO 46 302021	. 104651,41007	. . 10,01974,50864
	Sin.compl. AC viz.	AT 47 853354	. 74142,97807	. . 9,87008,00249
	Tangent	TP 37 808484	. 77591,67097	. . 19,88981,51113
	Complement is	TV=LI 52 191516		

			II. *Sinus.*	*Logar.Sin.*
Proport.	Sine compl. EG viz.	HG 43 697979	. 69085,69203	. . 9,83938,81107
	Sine compl. NM viz.	HM 13 99907	. 24191,01595	. . 9,38365,40970
	Sine	IL 52 191516	. 79006,43467	. . 9,89766,24083
				19,28131,65053
	Sine remaining angle vert.	IF 16 060281	. 27664,85482	. . 9,44192,83946
	But the arc is	IL 52 191516		
	Difference is arc	LF 36 131245, measure of the angle sought ACD.		

PROBLEM 10.

With two sides given with the angle included by the same, either other angle is sought.

In the oblique angled triangle ACD the angle ADC is sought.

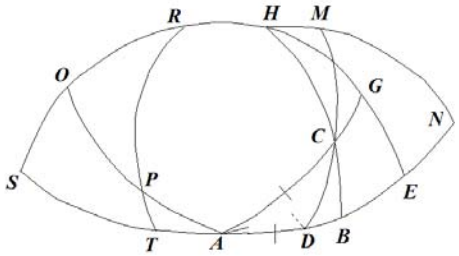


			1.*Upper diagram.*	2.*Lower diagram.*
Given	Sides	AC 24 065185	42 146646	
		AD 42 146646	30 000000	
	Angle CAD	46 302020	36 131235	

Terms of the ratio.

I. For the segment of the base. *by Problem* 6, *Cap.*3.

Proport.
- *Radius.*
- *Tangent of Hypotenuse.*
- *Sine comp. of angle given.*
- *Tangent seg. of base opp. given angle.*



II. For angle sought, *per Consec.*6.

Sine seg. of base opp. to given angle.
Sine seg. of base opp. to contained angle.
Tangent of angle contained.
Tangent of angle sought

Illustrated by numbers.

I.

1.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . . . RS	90 0000	. 100000,00000	. . 10,00000,00000
	Tang. Hypot. AC=ST	24 065185	. 44659,25969	. . 9,64991,15077
	Sin.compl. SO viz.RO	43 697980	. 69085,69203	. . 9,83938,81107
	Tang.segment. OP=AB	17 146646	. 30853,15726	. . 9,48929,96184
Therefore remaining seg.	DB	25 000000		

II.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Sine seg. of base is DB	25 000000	. 42261,82617	. . 9,62594,82594
	Sine remaining seg. AB	17 146646	. 29481,83629	. . 9,46955,45148
	Tang. of angle EG	46 302020	. 104651,41007	. . 10,01974,50890
				19,48929,96032
	Tangent of angle sought NM	36 131235	. 73004,79176	. 9,86335,13418

The working for the angle ADC of the lower diagram.

2.

I. *Sin.&Tang.* *Log.Sin.&Tang.*

Proport.

Radius . RS	90 0000	.	100000,00000 .	.10,00000,00000
Tang. AC=ST	42 146646	.	90504,92470 .	. 9,95667,22064
Sin.compl. SO viz.RO	53 868765	.	80766,85559 .	. 9,90723,31753
Tang.segm. OP=AB	36 166052	.	73097,96633 .	.19,86390,53817

II.

Sin.&Tang. *Log.Sin.&Tang.*

Proport.

Sine segment of base	DB	6 166050	.	10741,02629 . .	9,03104,58364
Sine of segment	AB	36 166052	.	59012,73216 . .	9,77094,58190
Tang. of ang. given	EG	36 131235	.	73004,79176 . .	9,86335,13634
					19,63429,71824
Tang. of angle	NM	76 000693	.	401098,77321 . .	10,60325,13460

Compl. of semicircle is 103 99907 , the angle sought ADC.

The two remaining angles likewise can be found without more difficulty, clearly in the same manner by which we have found the remaining sides for so many problems.

1.

Side AC	24 065185
Side AD	42 146646
Sum of sides	66 211813
Half the sum	33 1059155
Diff. of sides	18 081461
Half the diff.	9 0407305

2.

Side AC	42 146646
Side AD	30 000000
Sum of sides	72 146646
Half the sum	36 073323
Diff. of sides	12 146646
Half the diff.	6 073325

1. Operation I.

			Logs. Sin.&Tang.
Proport.	Sine of half sum of sides	33 1059155	. 9,73734,24996
	Sine of half diff. of sides	9 0407305	. 9,19627,71847
	Tang. compl.half included angle	66 848990	. 10,36897,36696
			19,56525,08543 sum.
	Tang. $\frac{1}{2}$ diff. remaining angles	33 934033	. 9,82790,83547 diff.

Operation II.

			Logar. Sin.&Tang.
Proport.	Sine compl.half sum sides	56 894085	. 9,92306,89855
	Sine compl.half diff. sides	80 9592695	. 9,99457,09124
	Tang. compl. half angle incl.	66 848990	. 10,36897,36696
			20,36354,45820 sum.
	Tang. half sum angles	70 065270	. 10,44047,55965 diff.
	Half diff. remaining angles	33 934033	
	Sum	103 999303	Angle ACD
	Diff.	36 131237	Angle ADC.

2. Operation I.

			Logs Sin.&Tang.
Proport.	Sine half sum sides	36 073323	. 9,76998,26167
	Sine half diff. sides	6 073323	. 9,02449,00297
	Tang. compl.half incl. angles	71 934825	. 10,48653,42647
			19,51102,42944
	Tang. $\frac{1}{2}$ diff. remaining angles	28 848643	. 9,74104,16777

Operation II.

			Logar. Sin. & Tang.
Proport.	Sine compl.half sum sides	53 926677	. 9,90755,33018
	Sine compl.half diff. sides	83 926677	. 9,99755,55732
	Tang. compl. half incl. angle	71 9343825	. 10,78653,42647
			20,78408,98379
	Tang. half sum remaining angles	75 150664	. 10,57653,65361
	Half diff. angles	28 848643	
	Sum	103 999307	Angle ADC
	Diff.	46 302021	Angle ACD.

PROBLEM. 11

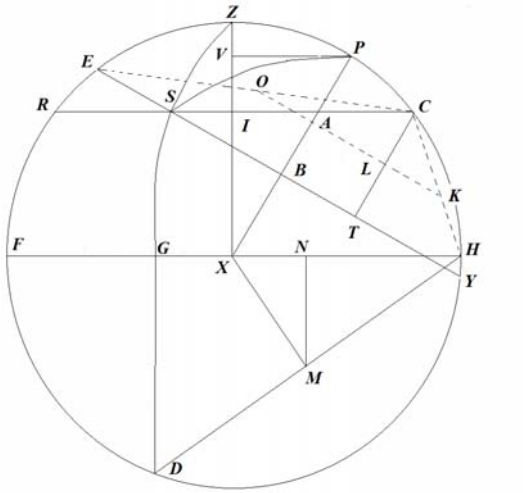
With the individual sides given, any angle is sought.

In the oblique angled triangle ZPS the angle PZS is sought.

With sides given
- PS 42 146646
- PZ 30 000000
- ZS 26 065185

Terms of the ratio.

Proport.
- *Rectangle from Sines of sides including angle sought.*
- *Square of radius.*
- *Rect. from* $\frac{1}{2}$ *sum of sines* & $\frac{1}{2}$ *diff. of bases* & *diff. of same sides.*
- *Square sine* $\frac{1}{2}$ *angle sought.*



Illustrated by arithmetic.

1. The sines of the two sides given is taken that include the angle sought ; and the logarithms of the sines of these taken.
2. The square of the radius is taken; and its logarithm.
3. The base is taken with the difference of the sides or legs, and half the sum and half the difference of these is taken in turn, and of these the sines and the logarithms of the sines.
4. If the first factor shall divide the remaining factor ; the side of the quotient is the sine of half the angle sought ; or if the sum of the first logarithms may be taken from the sum of the rest, half the difference is the logarithm of the sine of half the angle sought.

Given sides $\begin{cases} \text{PZ } 30\ \underline{000000} \\ \text{ZS } 26\ \underline{065185} \end{cases}$, sines $\left.\begin{cases} 50000,00000 \\ 40777,57121 \end{cases}\right|$ & Logs. are taken $\begin{cases} 9,69897,00043 \\ 9,61042,13420 \end{cases}$

1. Rect.of sines of sides	203887856050000000000	Log.sum.	19,30939,13473 A
2. Squared radius	10000000000000000000	Log.sq.rad.	20,00000,00000 B

Base	PS 42	146646
Diff. legs .	PC 5	934815
Sum Base & diff.	EPC 48	081461
Diff.Base & diff.sides	CY 36	211831

$\begin{cases} \text{Half sum . . CO } 24\ \underline{040730} \\ \text{Half diff. . CK } 18\ \underline{105915} \end{cases}$; Sines $\begin{cases} 40738,59542 \\ 31077,45544 \end{cases}$ Log. $\left.\begin{cases} 9,61000,60492 \\ 9,49244,54374 \end{cases}\right|$

3. Rect. $\frac{1}{2}$ Sum. & $\frac{1}{2}$ diff.	126605188385323808480000 0 etc.	sum	19,10245,14866 C
4. Quotient is	6209502320783665173 etc.	diff.	19,79306,01393 D

Side of quotient is 7880069944, Sine 51 $\underline{999650}$ $\frac{1}{2}$ differ. 9,89653,00696

And thus I say,

			Logar.Sinuum.
Proport.	*Rect.of sines of leg*	20388785605000 etc.	19,30939,13473 A
	Sq.of radius	10000000000000 etc.	20,00000,00000 B
	Rect. $\frac{1}{2}$ *sum.* & $\frac{1}{2}$ *differ.*	12660518838532380 etc.	19,10245,14866 C
	Sq. sine $\frac{1}{2}$ *angle sought*	620950232078366 etc.	diff. 19,79306,01393 D.

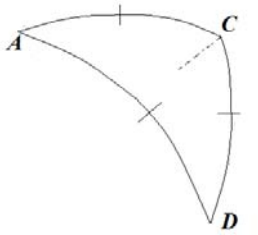
Side of square is 788006944. Sine51 999650 . . . . . $\frac{1}{2}$diff. 9,89653,00696

Of which twice the arc evidently 103 999300 is the angle sought PZS.

And that this compendium of logarithms should be so great a reward, I would rather the practitioner of trigonometry may value from his own senses first rather than from my words.

Otherwise 2.

The logarithms of the legs of the angle sought may be subtracted from the logarithms of the square of the radius and of half the sum of the three sides and of half the difference of the base and the sum of the legs: The remainder will be the logarithm of the square of the sine of the complement of half the angle sought to the quadrant.



Precepts Illustrated by Arithmetic.

In the oblique angled triangle ADC the angle ACD is sought.

Given	Base AD	42 146646	*Logar.Sin.*
	Legs AC	30 000000	9,69897,00043
	Legs CD	26 065185	9,61042,13430
			19,30939,13473 B Sum Logs.
Sum sides		96 211831 .	20,00000,00000 E log.sq.rad.
Half sum		48 105915 .	9,87179,49769
Diff.legs & Base		11 918539	
$\frac{1}{2}$Diff.legs & Base		5 959269 .	9,01628,70114
			38,88808,19883 F sum.
			19,30939,13473 B
			19,57869,06410 Diff. B & F.
Logarithm Sine	Deg.	38 000344	9,78934,53205 Half diff.
Compl. of this arc		51 999656.	
Compl. double arc		103 999312	is the angle sought ACD.

Otherwise 3.

From half the sum of the sides, the sides of the triangle are taken away individually, and the sum of the logarithms of the sine of half the sum of the sides and of the difference of the side subtending the given angle, is taken from the sum of the logarithms of the remaining difference of the sines and twice the logarithm of the radius : half of the remaining will be the Logarithm of the tangent of half the angle sought.

Arithmetical illustration of the precept.

The data from the above question may be retained.

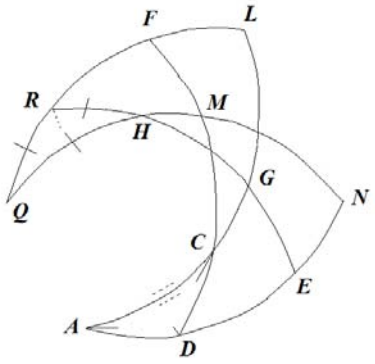
Sides	AD .	42 146646		
	AC .	30 000000		
	CD .	26 065185		
Sum of sides . . .		96 211831	*Log.Sin.*	
Half the sum		48 105915 .	9,87179,49769	18,88808,19883 sum.
Diff.1 of Base AD & $\frac{1}{2}$sum		5 959269 .	9,01628,70114	
Diff.2 of side AC & $\frac{1}{2}$sum		18 105915 .	9,49244,54374	19,10245,14866 sum.
Diff.3 of side CD & $\frac{1}{2}$sum		24 040730 .	9,61000,60492	
		Twice log radius		20,00000,00000
				39,10245,14866
				18,88808,19883
		Log. difference		20,21436,94983
		Half difference . . .		10,10718,47491
Log. Tangent is		51 999653.		
Of which twice the arc		103 999306 is the angle sought ACD.		

PROBLEM 12

With the angles given, any side is sought.

In the oblique angled triangle ADC the side AC is sought

Angles given { ADC . 103 999307
DAC . 36 131235
ACD . 46 302020



This problem itself is the converse of problem eleven, and may be resolved in the same manner, provided that the angles and sides may be interchanged. For the two smaller angles can always be equated to the two sides of the triangle included by the major arcs of the circles drawn from the same pole. But the third angle can be greater than a quadrant, and thus its complement to a semicircle can be taken conveniently for the third side. Moreover the angle where it shall have been found, will be one of the three sides sought ; but with one found from the same, the remainder will be found from the rule of proportion beside *Problem* 1.

As in triangle ACD, of which the arcs of the pole are HRQ, and its sides are equal to the angles of this ; AD is equal to the angle at H or to the arc EN. DC to the angle Q or to the arc MF. And AC to the angle HRF or to the arc GL. Therefore if the angles A.D.C shall be given, the sides QR.QH.RH are given. Moreover the angle CDE or MN may be equal to the side QH. And thus the triangle QRH may be resolved, following the precepts of problem 11.

		Log.Sin.	
Legs RQ	46 302020	9,85913,31911	
Legs RH	36 131235	9,77058,45404	
Difference of legs . . .	10 170785	+ 19,62971,77315	Sum Logs.
Base . . . . . QH	76 000693		
Sum Diff. of legs & base	86 171478		
Diff.Base & diff. of legs	65 829908		
Half sum diff. of legs & Base	43 085739	9,83447,92046	
Half differ. Base & diff. of legs	32 914954	9,73511,44888	

19,56959,36934 sum Logs.

Twice Log radius 20,00000,00000

\+ 19,62971,77315

19,93987,59619 Diff.Logs.

Log. Sine $\frac{1}{2}$ Angle HRQ 68 926676 9,96993,79809 Half diff.

Of which twice the angle is 137 853352

And twice the angle compl.to semicircle 42 146648 is the angle GRL, of which the measure is GL=AC, the side sought.

Otherwise 2.

With the given and the sought as above. I say,

Proport.
- *Rectangle from sines of the legs of the angle sought.*
- *Square of the radius.*
- *Rectangle from* $\frac{1}{2}$ *sines of the sum of the sides & diff. of the Base & half the sum.*
- *Square sine of compl. of half angle sought.*

Logs.Sin.

Legs
- RQ 46 302020 9,85913,31911
- RH 36 131235 9,77058,45404

Logs.Sin.

Legs
- RQ 46 302020 9,85913,31911
- RH 36 131235 9,77058,45404

Base QH 76 000693 \+ 19,62971,77315 Sum Logs.

Sum legs & base 158 433948

Half sum legs & base 79 216974 9,99226,30294

Differ. base & of half sum 3 226281 8,74900,27530

8,74126,57824 sum.Logs.

Twice log. radius 20,00000,00000

\+ 19,62871,77315

Log. Sine angle 21 073312 9,55577,40254

Compl. of this angle 68 926688

Twice which is QRH 137 853376

And its compl.to semicircle is 42 146624. Side sought AC.

Sides	QH .	76 000693		
	RQ .	46 302020		
	RQ .	36 131235		
Sum of sides . . .		158 433948	*Log.Sines.*	
Half sum		79 216974	. 9,99226,30294	18,74126,57824 sum Log.
Diff.1of side QH		3 216281	. 8,74900,27530	20,00000,00000 twice Log.Rad.
Diff.2of side RQ		32 914954	. 9,83447,92046	19,56957,36934 Sum Logs.
Diff.3of side RH		43 085739	. 9,73511,44888	
				20,82832,79110 Diff.
				10,41416,39555 Half Diff. is
Log. Tangent $\frac{1}{2}$ angle HRQ		68 926686		
double is the whole angle		137 853372		
And its Compl.to semicircle		42 146628	of which the measure is LG=AC.	

CHAPTER V.

1. So that all can be done with the minimum of labour.
If the first of the three given proportionals shall be the whole sine or radius, the middle two logarithms are added with the first place to the left removed ; the remainder will be the Logarithm sought.

The illustration of Problem 3, Ch.4. of plane triangles may be recalled, & Problem1, Ch.3 of spherical triangles :

Prop.			*Logs.*				*Logs.*
	Radius	90 0000	10,00000,0000	*Whole Sine*	90 000	.	10,00000,00000
	Tangent	283300	9,73168,5536	*Sine*	30 000	.	9,69897,00043
	Leg	11237943	3,05068,6815	*Sine Hyp.*	51 076287	.	9,89097,02062
	Leg	6058601	12,78237,2351	*Sine*	22 891768	.	19,58994,02104

2. If the first of the given amounts shall be some sine or side ; For the Logarithm of the first its arithmetical complement may be taken, just as the most learned *Master Briggs* taught in Ch. 15 of the *Arithmetica Logarithmica* ; and with the addition of three made, the one emerging to the left may be removed.

Examples may be borrowed from Problem 1, Ch.4 on planar triangles, & Problem 2.Ch.3. on spherical triangles.

Prop.	*Leg*	1123$\underline{7943}$	3,05068,6815 *Log.* 6,94931,3185 *c.Ar.*		*Sine*	67 $\underline{108232}$	9,96437,34001 *Log.* 0,03562,65999 *c.Ar.*
	Leg	6058$\underline{601}$	2,78237,2352		*Sin.Tot.*	90 $\underline{000000}$	10,00000,00000
	Radius	90 $\underline{0000}$	$\underline{10,00000,0000}$		*Sine*	38 $\underline{923713}$	$\underline{9,79815,67532}$
	Tangent	28 $\underline{33}$	19,73168,5537		*Sine*	43 $\underline{00000}$	19,83378,33531

Or if the logarithm of the secant of the complement of the arc is put in the first place, the same fourth member comes about : Because the radius is the mean proportion between the sines and the secant of the complement : and therefore if from twice the logarithm of the radius the logarithm of the given arc may be taken, it will produce the logarithm of the secant of the complement ; which agrees with the arithmetical complement, if you remove the one placed at the left. Therefore if we use the logarithm of the secant, after performing the addition two is taken away, so that there appears

10,03562,65999 *Log.secant*	22 $\underline{891768}$
0,03562,65999 *Compl.Arith.Log.*	67 $\underline{108232}$

3. If the first of the three given shall be the tangent, as above its arithmetical complement may be substituted, just as you see here from example 5 of the problem, Ch.3 on spherical triangles.

Proport.	*Tangent*	30 $\underline{000000}$	9,76143,93726 *Log.Tang.* 0,23856,06274 *Compl.Arith.Log.Tang.*
	Radius	90 $\underline{000000}$	10,00000,00000
	Tangent	22 $\underline{891768}$	$\underline{9,62556,69364}$
	Sine	47 $\underline{000000}$	19,86412,74638

Or the logarithm of the complement of the tangent may be taken, which as before is almost the same as with the arithmetic complement, so that

Tangent Complement of the arc	60 $\underline{000000}$	10,23856,66274
Arithmetical Complement first put in place		0,23856,66274

Since the mean proportional radius gives the ratio between the tangent of the arc and the complement. And therefore if the logarithm of the tangent may be taken from twice the logarithm of the radius, the logarithm of the complement of the tangent will remain.

4. But if the four proportional numbers do not express lines but rectangles, as when some angle is sought with the three sides given, or conversely ; the arithmetical complements will be able to be taken for each logarithm of the first rectangle ; if which is done, everything can be performed by addition only. We can make use of Problem11, Ch.4.

Legs	*PZ*	30 000000	*Log.Sin*	9,69897,00043	*Compl.Arith.* 0,30120,99957
	ZS	26 067185	*Log.Sin*	9,61042,13430	*Compl.Arith.* 0,38957,86570
	Half sum	24 040730			9,61000,60492
	Half diff.	18 105915			9,49244,54374
					19,79306,01393
	Half sum, as above				9,89653,00696

			Log.of sines.	
Half sum of sides	48 105915	9,87179,49769	*Compl.Arith.*	0,12820,50341
First Difference	5 959269	9,01628,70114	*Compl.Arith.*	0,98371,29886
			Second Diff.	9,49244,54274
			Third Diff.	9,61000,60492
			Sum	20,21436,94983
			Half sum, as above	10,10718,47491

Here the arithmetical complements are taken for the first two logarithms ; because these two do account for the first rectangle from the four proportions, and twice the logarithm of the radius is left out for the subtraction of two from the sum that comes about from the addition of the five logarithms : just as Mr. *Briggs* has demonstrated, and we ourselves have shown many times in our public lectures on Astronomy.

The whole doctrine of ellipses that I have in preparation, with curved lines in place that I intended to attach, whereby I show the use of planer as well as spherical triangles, but because of the swiftness of printing and the short time available finally I was unable to put in hand. But with this present in the following (God willing).

End.

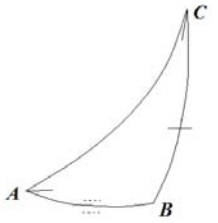
CAPUT IIII.

De Triangulorum Obliquangulorum diminsione.

PROBLEMA 1.

Datis Angulis duabus & Latere alteri datorum opposito, Quaeritur LATUS *reliquo angulo oppositum.*

In Triangulo Obliquangulo ACB quaeritur Latus AB



Datis { Angulis { BAC 103 999307 ; ACB 36 131235 } Compl. 76 000693 ; Latere CB 42 146646 }

Termini Rationis.

Proport. { *Sinus anguli lateri dato oppositi.* ; *Sinus lateris dati.* ; *Sinus anguli reliqui.* ; *Sinus lateris quaesiti.*per Cons.3.Cap.2. }

Illustrato per numeros.

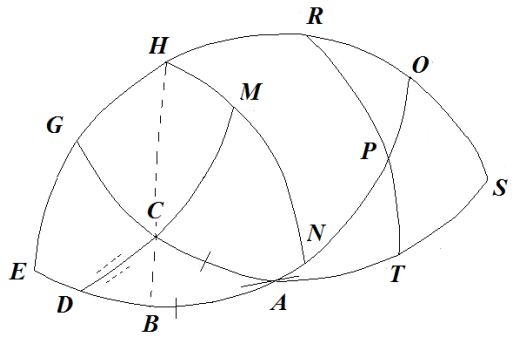
				Sinus		*Logar.Sin.*
Proport.	Sinus Anguli	CAB	76 000693	97029,86512	. .	9,98690,54277
	Sinus Lateris	CB	42 146646	67103,04563	. .	9,82674,22302
	Sinus Anguli	ACB	36 131235	58963,67471	. .	9,77058,45404
						19,59732,67707
	Sinus Lateris	AB	24 065185	40777,57122	. .	9,61042,13430

Acquisitis Lateribus duobus una cum angulis iiidem oppositis, potest etiam reliquum latus hunc scilicet in modum obtineri.

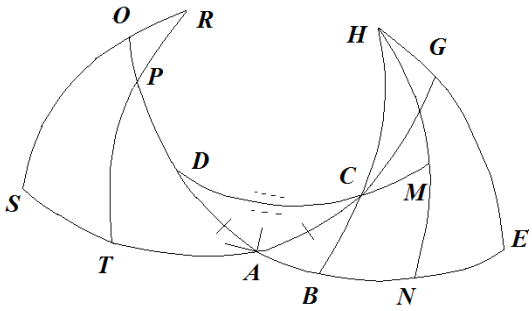
		Sin & Tang.	*Log.Sin & Tang.*
Proport.	Sinus semisiis differentiae angulorum	33 934036	9,74681,94465
	Sinus semisiis summae angulorum	70 065271	9,97316,55681
	Tangens semisiis differentiae laterum	9 040731	9,20170,63309
			19,17487,18990
	Tangens semisiis lateris reliqui	15 00000	9,42805,24525

PROBL. 2.

Datis Lateribus duabus & Angulo ab iisdem comprehenso, Quaeritur LATUS *reliquum.*



Ad hujus & subsequentium fere omnium solutionem, pro quibus duae requiruntur operationes, Trangulum Obliquangulum daturum in duo Rectangula est reducendum, ope scilicet perpendicularis ab extremitate lateris noti ductae & quoties fieri possit in latus quaesitum, aut angulo quaesito oppositae. In Triangulis itaque his Rectangulis quorum partes simili situ respondent, si singulae innotescunt, non latebunt etiam & Obliquanguli singulae. Ex iis vero, quae Capiti tertio praefiximus, probe intellectis, singulas horum partes exquirere non erit difficile; Exclusa enim perpendiculari una cum Radio, quemadmodum *ad Consectaria 4.5.6.7 Capitis secundi* praecepimus; Erunt Sinus vel Tangentes partis mediae alteriusTrianguli & extremae reliqui, medii proportionales inter Sinus vel Tangentes partis mediae reliqui & extremae alterius Trianguli. Nos autem majoris perspicuitatis ergo, demonstrative Problematum subsequentium resolutiones sigillatim aggredimur. Quoniam vero erpendicularis ab angulo verticali demittenda, aliquando intra, quandoque extra Triangulum cadat, prout anguli ad Basin eiusdem vel diversae fuerint affectionis, idcirco ne ulla calculo ad haereat remora, duo opposuimus schemata iisdem consignata litteris, ut Rationis Termini, nec non Illustratio Arithmetica, utrisque inserviant.



In Triangulo Obliquangulo ACD quaeritur Latus DC

				1.*Super.scheme.*	2.*Infer.schem.*
Datis	Lateribus	AD	42	14646	24 065185
		AC	30	000	30 000
	Angulo	DAC	36	131235	103 999307

Hoc & nonulla ut dixi subsequentia Problemata duplici indigent praxi, quarum prior inventioni segmentorum Basis, aut Angulorum verticalium subservit;
Altera vero Angulorum aut Laterum quaesitorum.

Termini Rationis.

I. Pro Segmento Basis. *Per Probl*.6.*Cap*.3.

Proport.
- *Radius.*
- *Tangens Hypotenusae.*
- *Sinus Complementi anguli comprehensi.*
- *Tangens segmenti comprehens Basis angulo contermini.*
- *Atque inde reliquum segmentum,*

II. Pro Latere quaesito. *Per Consec*.5.

Proport.
- *Sinus Complementi Basis ultimo inventi.*
- *Sinus Complementi Hypotenusae.*
- *Sinus Complementi reliqui segmenti Basis.*
- *Sinus Complementi lateris quaesiti.*

Illustratio per numeros,
I.

		Sin.&Tang.	*Logar.Sin.&Tang.*
Radius . . . . RS	90 0000	. 100000,00000	. . 10,00000,00000
Tang. Hypotenusae TS=AC	30 0000	. 57735,02692	. . 9,76143,93726
Sin.compl. OS videlicet RO	53 868765	. 80766,85560	. . 9,90723,31753
Tang.segm.Basis OP=AB	25 0000	. 46630,76582	19,66876,25479
Cuius compl. est PA=BE	65 0000		

Proport.

Possumus etiam absque quadrantali RST terminos Rationis pro segmentis Basis aut angulorum verticalium ita constituere.

Proport.
- *Sinus complementi anguli comprehensi.*
- *Tangens complimentae Hypotenusae.*
- *Radius.*
- *Tangens compl. segmenti Basis angulo comprehenso & contermini,*

Illustratio per numeros.
I.

			Sin.&Tang.	*Logar.Sin.&Tang.*
Proport.	Sin.compl. EG vid. HG	53 868765	80766,86698	9,90723,31753
	Tang. compl. AC vid. GC	60 0000	173205,08076	10,23856,06274
	Radius . . . . HE	90 0000	100000,00000	10,00000,00000
	Tang. compl. AB vid. EB	65 0000	214450,69205	10,33132,74521
	Est ergo segm. AB	25 0000		

II.

			Sinus.	*Logar.Sin.*
Proport.	Sinus compl. AB vid. BE	65 0000	90630,77870	9,95727,57115
	Sinus compl. AC vid. CG	60 0000	86602,54037	9,93753,06317
	Sinus compl. DB vid. BN	72 853354	95555,33089	9,98025,49202
				19,91778,55519
	Sinus compl. DC vid. CM	65 934815	91308,21216	9,96050,98408
	Est ergo DC	24 065185	Latus quaesitum.	

Quod si Angulus comprehesus sit obtusus, quemadmodum videre est in Triangulo obliquangulo ACD inferioris Diagraphae, eodem operandum est modo. Retineantur reliaqua data praemissa.

I.

			Sin.&Tang.	*Logar.Sin.&Tang.*
Proport.	Radius . . . . RS	90 0000	100000,00000	10,00000,00000
	Tang. Hypotenusae ST=AC	30 0000	57735,02692	9,76143,93726
	Sin.compl. OS vid. RO	13 999307	24191,01595	9,38365,41009
	Tang.segment.Basis OP=AB	7 950891	12966,68969	19,14509,34735
	Cuius Complem. est BE	82 049109		

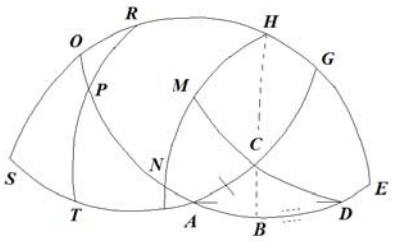
II.

			Sinus.	*Logar.Sin.*
Proport.	Sinus compl. AB vid. BE	82 049109	. 99038,69909 .	. 9,99580,49270
	Sinus compl. AC vid. CG	60 0000	. 86602,54037 .	. 9,93753,06317
	Sinus compl. DB vid. BN	57 983930	. 84789,94309 .	. 9,92834,43146
				19,86587,49463
	Sinus compl. DC vid. CM	47 853354	. 74142,97807 .	. 9,87007,00193
	Est ergo DC	42 146646 Latus quaesitum.		

PROBL. 3.

Datis Angulis duabus & Latere alteri datorum opposito, Quaeritur LATUS *ab iisdem comprehensum.*

In Trangulo Obliquangulo ADC quaeritur latus AD



			1.*Superior.scheme.*	2.*Infer.schem.*
Datis	Angulis	CDA	36 131235	103 999307
		CAD	46 302020	36 131345
	Latere	AC	24 065185	42 146646

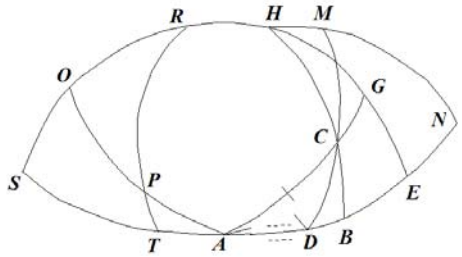
Termini Rationum.

I. Pro segmento Basis. *per Probl*.6.*Cap*.3.

Proport.
- *Radius.*
- *Tangens Hypotenusae sive lateris dati.*
- *Sinus compleminti anguli Hypotenusae contermini.*
- *Tangens segmenti Basis Hypotenesae contermini.*

II. Pro reliquo Basis segmento. *Per Consect*.6.

- *Tangens anguli lateri data oppositi.*
- *Sinus segmenti Basis lateri data contermini.*
- *Tangens reliqui anguli.*
- *Sinus reliqui segmenti Basis.*



Si perpendicularis cadit intra, segmentorum summa; Sin extra, differentia eorundem est latus quaesitum.

Illustratio per numeros.

I.

1.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . . . RS	90 0000	. 100000,00000	. . 10,00000,00000
	Tang. Hypot. ST=AC	24 065185	. 44659,25969	. . 9,64991,15077
	Sin.compl. OS vid.OR	43 697980	. 69085,69203	. . 9,83938,81107
	Tang.segment. OP=AB	17 146646	. 30853,15726	. . 9,48929,96184
	Cuius Complem. est BE	82 049109		

II.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Tang. anguli ad D vid. NM	36 131235	. 73004,79176	. . 9,86335,13634
	Sinus segmenti AB	17 146646	. 29481,83629	. . 9,46955,45148
	Tang.anguli ad D vid. GE	46 302020	. 104651,41007	. . 10,01974,50890
				19,48929,9603
	Sinus reliqui segmenti. DB	25 000000	. 42261,82617	. . 9,62594,82404
	Segmentum AB est . . .	17 146646		
	Summa segmentorum est AD	42 146646	Latus quaesitum.	

Quod si Anguli ad Basim sint diversae affectionis, ac proinde Perpendicularis cadat extra,quemadmodum in inferioris schematis triangulis , operandi modus priori consimilis erit, Retineantur itaque reliqua data.

I.

2.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . RS	90 0000	. 100000,00000	. .10,00000,00000
	Tangs. ST=AC	42 146646	. 90504,92470	. . 9,95667,22064
	Sin.compl. SO vid.OR	53 868765	. 80766,85559	. . 9,90723,31753
	Tang.segment. OP=AB	36 166052	. 73097,96633	. . 9,86390,53817

II.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Tang. anguli ad D vid.	NM 76 000693	401098,77321	10,60321,13258
	Sinus segmenti	AB 36 166052	59012,73216	9,46955,45148
	Tang.anguli ad A vid.	GE 36 131235	73004,79176	9,86335,13634
				19,63429,71653
	Sinus reliqui segmenti.	DB 6 166052	10741,02629	9,03104,58385

Segmentum AB est . . . 36 166052

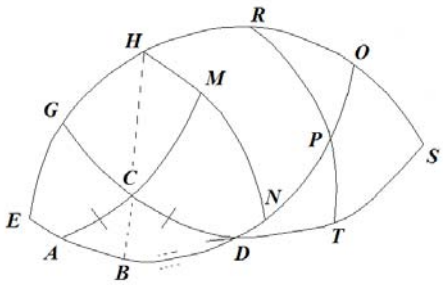
Summa segmentorum est AD 30 000000 Latus quaesitum.

PROBL. 4.

Datis Lateribus duobus & Angulo altero datorum opposito, Quaeritur LATUS *reliquum.*

In Trangulo Obliquangulo ADC quaeritur latus AD

				1.*Super.scheme.*	2.*Infer.schem.*
Datis	Lateribus	DC	30 000000	24 065185	
		AC	24 065185	137 853354	
	Angulo	ADC	36 131235	103 999307	



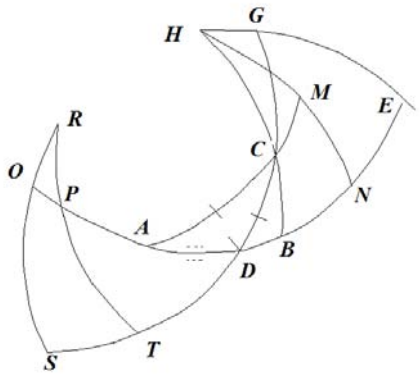
Termini Rationum.

I. Pro segmento Basis. *per Probl*.6.*Cap*.3.

Proport.
- *Radius.*
- *Tangens Hypotenusae angulo dato conterminae.*
- *Sinus compleminti anguli dati.*
- *Tangens segmenti Basis angelo dato contermini.*

II. Pro Latere quaesito. *Per Consect*.5.

- *Sinus compl. Lateris angulo dato contermini.*
- *Sinus compl. segm. Basis etde angulo contermini.*
- *Sinus compl. reliqui Lateris.*
- *Sinus complem. reliqui segmenti Basis.*



Si perpendicularis cadit intra, segmentorum summa; Sin extra, differentia eorundem est latus quaesicum.

Illustratio Arithmetica.

1.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . RS	90 000000	. 100000,00000	. . 10,00000,00000
	Tangens. Hypot. DC=ST	30 000000	. 57735,06292	. . 9,76143,93726
	Sin.compl. OS vid. RO	53 868765	. 80766,85559	. . 9,90723,31753
	Tang.segment. OP=DB	25 000000	. 46630,76582	. . 9,66867,25479

			II. *Sinus.*	*Logar.Sin.*
	Sinus compl. DC vid. CG	60 000000	. 86602,54037	. . 9,93753,06317
	Sinus compl. DB vid. BE	65 000000	. 90630,77870	. . 9,95727,57115
	Sinus compl. DB vid. BN	65 934815	. 91308,21216	. . 9,96050,98404
				19,91778,55519
Proport.	Sinus compl. AB vid. BN	72 853354	. 95555,33089	. . 9,98025,49202
	Est ergo segmentum AB	17 146646		
	Segmentum vero DB	25 000000		
	Ergo segmentorum summa AD	42 146646	Latus quaesitum.	

Praxis pro Latere AD Trianguli inferioris schematis.

2.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . RS	90 000000	. 100000,00000	. . 10,00000,00000
	Tangens. Hypot. DC=ST	24 065185	. 44659,25969	. . 9,64991,15077
	Sin.compl. OS vid. RO	13 999307	. 24191,01595	. . 9,38365,41009
	Tang.segment. OP=DB	6 166050	. 10803,52716	. . 9,03356,56086

		II.	*Sinus.*	*Logar.Sin.*
	Sinus compl. DC vid. CG	65 934815	. 91308,21216	. . 9,96050,98404
	Sinus compl. DB vid. BE	83 833947	. 99421,47796	. . 9,99748,02351
	Sinus compl. DB vid. BN	47 853354	. 74142,97807	. . 9,87007,00249
				19,86755,02600
Proport.	Sinus compl. AB vid. BN	53 833956	. 80731,01834	. . 9,90704,04196
	Est ergo segmentum AB	36 166050		
	Segmentum vero DB	6 166050		
	Ergo segmentumorum summa AD	30 000000	Latus quaesitum.	

PROBLEMA 5.

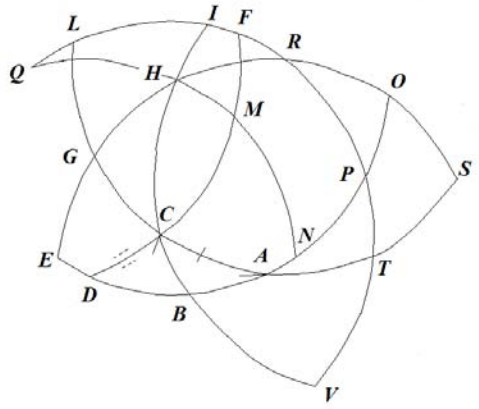
Datis Angulis duobus cum Latere ab iisdem comprehenso, Quaeritur LATUS alterutrum. In Triangulo Obliquangulo ACD quaeritur Latus DC.

			1.*Super.scheme.*	2.*Infer.schem.*
Datis	Angulis	DAC	36 131235	36 131235
		ACD	103 999307	46 302020
	Latere	AC	30 000	42 146646

Termini rationum.

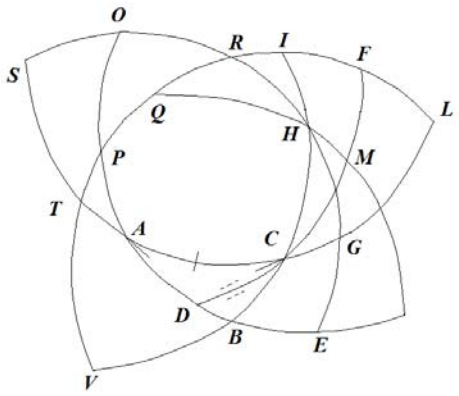
I.Pro segmento Anguli verticalis. *Per Probl.*16.

Proport.
- *Radius.*
- *Tangens anguli ad Basim, sive lateri quaesito oppositi.*
- *Sinus complem.; Hypotenusae; sive lateris dati.*
- *Tangens complem. segmenti anguli verticalis.*



II. Pro Latere quaesito. *Per Consect.7.*

Proport.
- *Sinus compl.reliqui segmenti anguli verticalis.*
- *Tangens Lateris dati.*
- *Sinus compl. anguli verticalis ultimo inventi.*
- *Tangens Lateris quaesiti.*



Illustratio per numeros.

1.

Pro.		I. *Sin.*&*Tang.*	*Log.Sin.*&*Tang.*
Radius	AS 90 000000	100000,00000	10,00000,00000
Tangens anguli . . .	CAD vid. SO 36 131235	73004,79176	9,86335,13634
Sin.compl. lateris . .	CA vid. AT 60 000000	86602,54037	9,93753,06317
Tang.segment. angulus vert.TP vid TV	32 302713	63224,00405	9,80088,19951

Est ergo anguli vertical.segmentum 57 697287 vid. ACB.

			II.	*Sinus.*	*Logar.Sin.&Tang.*
Proport.	Sinus compl.	FI vid. QI	43 697980	. 69085,69203 .	. 9,83983,81107
	Tangens lateris	AC vid. LG	30 000000	. 57735,02692 .	. 9,76134,93726
	Sinus complem.	LI vid. RI	32 302713	. 53939,23708 .	. 9,72786,02462
					19,48929,96188
	Tang.later.quaesiti	FM=DC	24 065185	. 44659,25969 .	9,64991,15081

Sin extra cadit Perpendiculum, ut in inferiore schemate; Retentis reliquis datis ; Aio

2.

			I.	*Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . .	AS	90 000000	. 100000,00000 .	. 10,00000,00000
	Tangens . .	SO	36 131235	. 73004,79176 .	. 9,86335,13634
	Sinus . . .	AT	47 853350	. 74142,97807 .	. 9,38365,41009
	Tangens . .	TP	28 425765	. 54127,92962 .	19,73342,13883
	Complem.est	TV=IL	61 574345	Atque inde Angulus DCB	15 272215.

			II.	*Sinus.*	*Logar.Sin.*
Proport.	Sinus compl.	FI vid. QI	74 727785	. 96368,52972 .	. 9,98438,56593
	Tang.lateris	AC vid. LG	42 146646	. 90504,92470 .	. 9,95607,22854
	Sinus compl.	LI vid. RI	28 425765	. 47601,97234 .	. 9,67762,49419
					19,63429,71473
	Tang.lateris	FM=DC	24 065185	. 44659,25969 .	. 9,64991,14880

Poterunt ctiam ex iisdem datis reliqua duo latera eodem labore simul obtineri hunc scilicet in modum.

	1.	2.
Angulus DAC	36 131235	36 131235
Angulus ADC	103 999307	46 303030
Summa angulorum	140 120542	82 433255
Semissis summae	70 065271	41 216627
Differentia angulorum	67 868072	10 170785 $\frac{1}{2}$
Semissis differentiae	33 934036	5 085392 $\frac{1}{2}$

1. Operatio I.

	Arcus	*Logar.Sin.&Tang.*
Sinus semissis summae angulorum	70 065271	9,97316,55681
Sinus semissis differentiae angulorum	33 934036	9,74681,94465
Tangens semisiis lateris comprehensi	15 000000	9,42805,24525
		19,17487,18990
Tang. $\frac{1}{2}$ differentiae reliquorum laterum	9 040731	9,20170,63309

Operatio II.

	Arcus	*Logar.Sin.&Tang.*
Sinus compl.semissis summae angulorum	19 934729	9,53268,99540
Sinus compl.semissis differentiae angulorum	56 065964	9,91891,10459
Tangens semisiis lateris comprehensi	15 000000	9,42805,24525
		19,34696,34964
Tangens semissis summae laterum	33 105916	9,81427,35444
Semissis summae laterum est	33 105916	
Semissis differentiae laterum est	9 105916	
Summa summae & differentiae laterum est	42 146647	Latus AD quaesitum.
Differentia summae & differentiae laterum est	24 065185	Latus DC quaesitum.

Retentis similiter datis Trianguli inferioris schematis. Aio

2. Operatio I.

	Arcus	*Logar.Sin.&Tang.*
Sinus semissis summae angulorum	41 217728	9,81882,46407
Sinus semissis differentiae angulorum	5 085393	8,94763,13168
Tangens semisiis lateris comprehensi	21 073323	9,58583,62561
		18,53346,75729
Tang. $\frac{1}{2}$ differentiae reliquorum laterum	2 967409	8,71464,29322

Operatio II.

	Arcus	*Logar.Sin.&Tang.*
Sinus compl.semissis summae angulorum	48 783372	9,87634,70195
Sinus compl.semissis differentiae angulorum	84 904607	9,99828,71096
Tangens semisiis lateris comprehensi	21 073323	9,58583,62562
		19,58412,33658
Tangens semissis summae laterum	27 032592	9,70777,63463
Semissis summae laterum est	27 032592	
Semissis differentiae laterum est	2 967409	
Summa summae & differentiae laterum est	30 000001	Latus AD quaesitum.
Differentia summae & differentiae laterum est	24 065183	Latus DC quaesitum.

PROBL. 6.

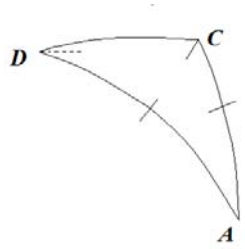
Datis Lateribus duobus & Angulo alteri datorum opposito, Quaeritur ANGULUS reliquo lateri oppositus.

In Triangulo Obliquangulo ACD quaeritur Angulus ADC

Datis	Lateribus	AC	30 000000
		AD	42 144266
	Angulo	ACD	103 999307

Termini Rationis.

- *Sinus lateris angulo dato oppositi.*
- *Sinus anguli dati.*
- *Sinus lateris reliqui.*
- *Sinus anguli quaesiti.* per Cons.3.Cap.2.



Illustratio Arithmetica.

				Sinus		*Logar.Sin.*
Proport.	Sinus Lateris	AD	42 146646	67103,04565	. .	9,82674,22303
	Sinus Anguli	ACD	76 000693	97029,86513	. .	9,98690,57277
	Sinus Lateris	AC	30 000000	50000,00000	. .	9,69897,00043
						19,68587,57320
	Sinus Anguli	ADC	46 302021	72299,15012	. .	9,85913,35017

Angulis acquisitis duobus una cum lateribus iisdem oppositis, possumus etiam reliquum angulum eundem in modum deprehendere quo reliquum latus obtinuimus ad Probl.1. huius Capitis.

PROBL. 7.

Datis duobus Angulis & Latere ab iisdem comprehenso, Quaeritur ANGULUS reliquus.

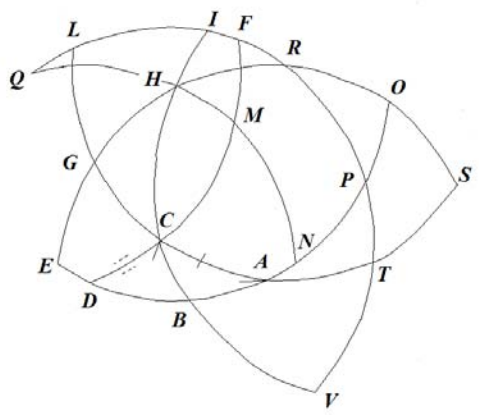
In sequente Triangulo Obliquangulo ACD quaeritur Angulus ADC.

				1.*Super.scheme.*	2.*Infer.schem.*
Datis	Angulis	DAC	103 999307	36 131235	
		DAC	36 131235	46 302020	
	Latere	AC	30 000	42 146646	

Termini rationum.

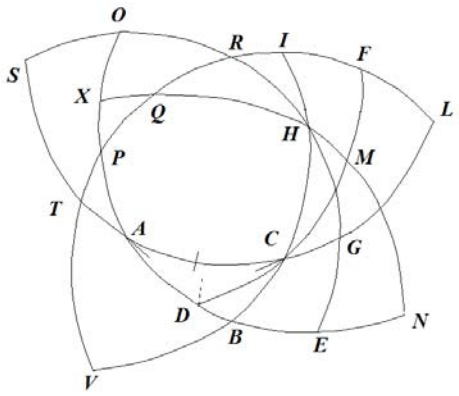
I.Pro segmento Anguli verticalis. *Per Probl.*6.

Proport.
- *Radius.*
- *Tangens anguli ad Basim.*
- *Sinus complem lateris dati.*
- *Tangens Complem. segmenti anguli verticalis.*



II. Pro Angulo quaesito. *Per Consect.4.*

Proport. { *Sinus segmenti anguli verticalis ultimo inventi.*
Sinus reliqui anguli verticalis.
Sinus complementi anguli ad Basim.
Sinus complementi anguli quaesiti.



Illustratio Arithmetico.

1.

		I. *Sin.*&*Tang.*	*Log.Sin.*&*Tang.*
Proport. Radius	AS 90 000000	. 100000,00000	. . 10,00000,00000
Tangens anguli . . .	CAD vid. SO 36 131235	. 73004,79176	. . 9,86335,13634
Sin.compl. lateris . .	CA vid. AT 60 000000	. 86602,54037	. . 9,93753,06317
Tang.segment. angulus vert.	TP vid TV 32 302713	. 63224,00405	. . 19,80088,19951

Est ergo anguli vertical.segmentum 57 697287 vid. ACB.

		II.	*Sin.*	*Logar.Sin.*
Proport.	Sinus IL	57 697287	. 84523,65276 . .	9,92697,82551
	Tangens anguli . . . IF	46 302022	. 72299,15012 . .	9,85913,31911
	Sinus compl. EG vid. HG	53 808765	. 80766,85559 . .	9,90723,31753
				19,76636,63664
	Sinus compl. MN vid HM	43 697979	. 69085,69203 . .	9,83938,81113
	Est ergo angulus ADC	40 302021	angulus quaesitus.	

Eadem requiritur praxis in Triangulo inferioris schematis.

2.

		I.	*Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . . . . AS	90 000000	. 100000,00000 . .	10,00000,00000
	Tangens . . . SO	46 30201	. 104651,41007 . .	10,01974,50864
	Sin.compl. CA vid. AT	47 853354	. 74142,97807 . .	9,87008,00249
	Tangens TP	37 808484	. 77591,67097 . .	19,88981,51113
	Complement est TV=IL	52 191526		

		II.	*Sin.*	*Logar.Sin.*
Proport.	Sinus IL	52 191516	. 79006,43467 . .	9,89766,24083
	Sinus . . . . . IF	16 060281	. 27664,85382 . .	9,44192,83946
	Sinus compl. EG vid. HG	43 697979	. 69085,69203 . .	9,83938,81107
				19,28131,65053
	Sinus compl. MN vid HM	13 999307	. 24191,01595 . .	9,38365,40970
	Quo addito Quadranti HX	90 000000		
	Conflatur arcus MX	103 999307	mensura Anguli ADC quaesiti.	

PROBL. 8.

Datis Lateribus duobus &Angulo alteri datorum opposito, Quaeritur ANGULUS ab iisdem comprehensus.

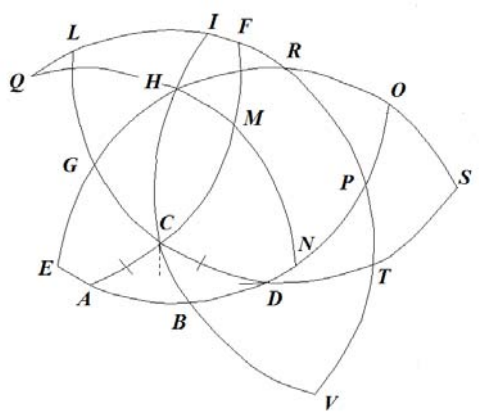
In Triangulo Obliquangulo ADC quaeritur Angulus ACD.

				1.*Super.scheme.*	2.*Infer.schem.*
Datis	Lateribus	AC		24 065185	30 000
		CD		30 000	42 146646
	Angulo	ADC		36 131235	46 302020

Termini rationum.

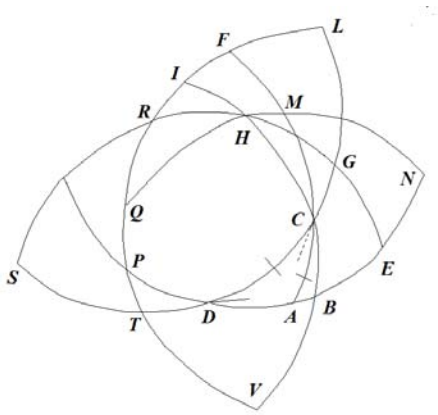
I. Pro segmento Anguli verticalis. *Per Probl.*6.

Proport.
- *Radius.*
- *Tangens anguli dati.*
- *Sinus complem. lateris dato contermini.*
- *Tangens Complem. segmenti anguli verticalis.*



II. Pro Angulo quaesito. *Per Consect.7.*

Proport.
- *Tangens lateris angulo dato oppositi.*
- *Tangens reliqui lateris.*
- *Sinus Complementi segmenti anguli verticalis ultimo inventi.*
- *Sinus Compl. reliqui anguli verticalis.*



Si Perpendicularis cadit intra, angulorum verticalium summa; Sin extra, differentia eorundem est angulus quaesitus.

Illustratio Arithmetica.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius	DS 90 000000	. 100000,00000 .	. 10,00000,00000
	Tangens	SO 36 131235	. 73004,79176 .	. 9,86335,13634
	Sinus compl.	CD vid. DT 60 000000	. 86602,54037 .	. 9,93753,06317
	Tang.	TP 32 302713	. 63224,00405 .	. 19,80088,19951

Complement est TV=LI 57 697287 mensura segmenti Anguli DCB.

			II. *Sinus.*	*Logar.Sin.&Tang.*
Proport.	Tang.lateris	AC=FM 24 065185	. 44659,25969 .	9,64991,15077
	Tangens lateris	DC= LG 30 000000	. 57735,02692 .	. 9,76134,93726
	Sinus complem. LI	vid. IR 32 302713	. 53939,23708 .	. 9,72786,02462
				19,48929,96188
	Sinus compl. IF	vid. IQ 43 697980	. 69085,69203 .	. 9,83983,81111

Est ergo arcus IF 46 302021
Et arcus primo inventus LI 57 697287
Summa angulorum verticalium 103 999308 Angulus quaesitus ACD.

In Triangulo inferioris schematis.

2.

				I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius	DS	90 000000	. 100000,00000 . .	10,00000,00000
	Tangens . . .	SO	46 302021	. 104651,41007 . .	10,01974,50864
	Sin.compl. CF vid.	DT	47 853354	. 74142,97807 . .	9,87008,00249
	Tangens	TP	37 808484	. 77591,67097 . .	19,88981,51113
	Complement est TV=LI		52 191526		

II.

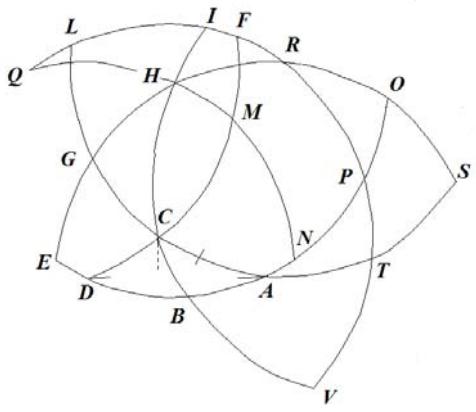
				Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Tangens lateris AC=FM		30 000000	. 57735,02682 . .	9,76143,93726
	Tangens lateris DC=LG		42 146646	. 90504,92470 . .	9,95667,22064
	Sinus complem. LI vid.LR		37 808484	. 61302,45434 . .	9,78747,75192
					19,74414,97256
	Sinus complem. IF vid. IQ		73 939719	. 96097,10775 . .	9,98271,03530
	Ergo est arcus	IF	16 020681		
	At inventus Arcus	IL	52 191516		
	Differentia	FL	36 131235	mensura Anguli DCA.	

PROBL. 9

Datis Angulis duobus & Latere alteri datorum opposito, Quaeritur ANGULUS reliquus.

In Triangulo Obliquangulo ADC quaeritur Angulus ACD

				1.*Super.scheme.*	2.*Infer.schem.*
Datis	Angulis	DAC	36 131235	46 302020	
		ADC	46 302021	103 999307	
	Latere	AC	30 000000	42 146646	

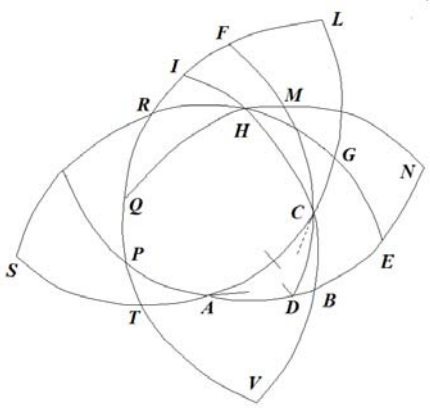


Termini Rationum.

I. Pro segmento angulo verticalis. *Per Probl.6.*

Proport.
- *Radius.*
- *Tangens anguli lateri dato contermini.*
- *Sinus complementi lateris angulo dato contermini.*
- *Tangens segmenti anguli verticalis.*

II.Pro Angulo verticali quaesico. *Per Consect. 4.*



Proport.
- *Sinus complementi anguli lateri dato contermini.*
- *Sinus compleminti reliqui anguli dati.*
- *Sinus segmenti anguli verticalis ultimo inventi.*
- *Sinus reliqui anguli verticalis.*

Si perpendicularis cadit intra, angulorum verticalium summa; Sin extra, differerenta est Angulus quaesitus.

Illustratio Arithmetica.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport. Radius	AS	90 000000	. 100000,00000 . .	10,00000,00000
Tangens	SO	36 131235	. 73004,79176 . .	9,86335,13634
Sinus compl. AC vid.	AT	60 000000	. 86602,54037 . .	9,93753,06317
Tang.	TP	32 302713	. 63224,00405 . .	19,80088,19951

Complement est TV=LI 57 697287 mensura segmenti Anguli ACB.

			II. *Sin.*	*Logar.Sin.*
Proport. Sinus compl. EG vid.	HG	53 808765	. 80766,85559 . .	9,90723,31753
Sinus compl. NM vid.	HM	43 697979	. 69085,69203 . .	9,83938,81107
Sinus angulus verticalis	IL	57 697287	. 84523,65276 . .	9,92697,82551
				19,76636,63658
Sinus reliqui anguli vert.	IF	46 302020	. 72299,15012 . .	9,85913,31905

Arcus IL est 57 697287

Arcuum summa est 103 999307 mensura anguli quaesiti ACD.

Praxis pro Angulo ACD Trianguli inferioris schematis.

2.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport. Radius	AS	90 000000	. 100000,00000 . .	10,00000,00000
Tangens . . .	SO	46 302021	. 104651,41007 . .	10,01974,50864
Sin.compl. AC vid.	AT	47 853354	. 74142,97807 . .	9,87008,00249
Tangens	TP	37 808484	. 77591,67097 . .	19,88981,51113

Complement est TV=LI 52 191516

				II. *Sinus.*	*Logar.Sin.*
Proport.	Sinus compl. EG vid.	HG	43 697979	. 69085,69203 . .	9,83938,81107
	Sinus compl. NM vid.	HM	13 99907	. 24191,01595 . .	9,38365,40970
	Sinus	IL	52 191516	. 79006,43467 . .	9,89766,24083
					19,28131,65053
	Sinus reliqui anguli vert.	IF	16 060281	. 27664,85482 . .	9,44192,83946

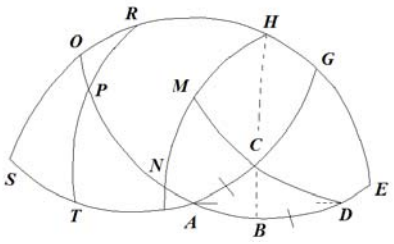
Est autem arcus IL 52 191516

Differentia est arcus LF 36 131245 mensura Anguli quaesiti ACD.

PROBLEMA 10.

Datis Lateribus duobus cum Angulo ab iisdem comprehenso, Quaeritur ANGULUS *alteruter.*

In Triangulo Obliquangulo ACD quaeritur Angulus ADC.

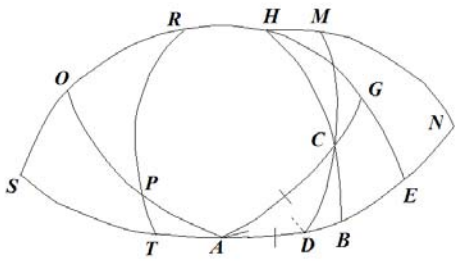


				1.*Superior.scheme.*	2.*Infer.schem.*
Datis	Lateribus	AC	24 065185	42 146646	
		AD	42 146646	30 000000	
	Angulo	CAD	46 302020	36 131235	

Termini Rationum.

I. Pro segmento Basis. *per Probl.*6.*Cap.*3.

Proport.
- *Radius.*
- *Tangens Hypotenusae.*
- *Sinus compleminti anguli dati.*
- *Tangens segmenti Basis angulo dato contermini.*



II. Pro angulo quaesito. *Per Consect*.6.

Sinus segmenti Basi angulo quaesito contermini.
Sinus segm. Basis angulo comprehenso contermini.
Tangens anguli comprehensi.
Tangens anguli quaesiti.

Illustratio per numeros.

I.

1.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Radius . . . RS	90 0000	. 100000,00000	. . 10,00000,00000
	Tang. Hypot. AC=ST	24 065185	. 44659,25969	. . 9,64991,15077
	Sin.compl. SO vid.RO	43 697980	. 69085,69203	. . 9,83938,81107
	Tang.segment. OP=AB	17 146646	. 30853,15726	. . 9,48929,96184

Ergo reliquum segment. DB 25 000000

II.

			Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Sinus segmenti Basis DB	25 000000	. 42261,82617	. . 9,62594,82594
	Sinus reliqui segmenti AB	17 146646	. 29481,83629	. . 9,46955,45148
	Tang.anguli EG	46 302020	. 104651,41007	. . 10,01974,50890
				19,48929,96032
	Tangens anguli quaesiti.NM	36 131235	. 73004,79176	. . 9,86335,13418

Praxis pro Angulo ADC Triangulo inferioris schematis.

2.

			I. *Sin.&Tang.*	*Log.Sin.&Tang.*
Proport.	Radius . RS	90 0000	. 100000,00000 .	.10,00000,00000
	Tangs. AC=ST	42 146646	. 90504,92470 .	. 9,95667,22064
	Sin.compl. SO vid.RO	53 868765	. 80766,85559 .	. 9,90723,31753
	Tang.segm. OP=AB	36 166052	. 73097,96633 .	. 19,86390,53817

II.

				Sin.&Tang.	*Log.Sin.&Tang.*
Proport.	Sinus segmenti Basis	DB	6 166050	. 10741,02629 .	. 9,03104,58364
	Sinus segmenti	AB	36 166052	. 59012,73216 .	. 9,77094,58190
	Tang.anguli dati	EG	36 131235	. 73004,79176 .	. 9,86335,13634
					19,63429,71824
	Tang.anguli	NM	76 000693	. 401098,77321 .	. 10,60325,13460

Compl. ad semicirculum est 103 99907 Angulus quaesitus ADC.

Non minore molestia reliqui duo Anguli simul investigari poterunt, eodem prorsus modo quo ad Problema quantum reliqua latera venati sumus.

1.		2.	
Latus AC	24 065185	Latus AC	42 146646
Latus AD	42 146646	Latus AD	30 000000
Summa Laterum	66 211813	Summa Laterum	72 146646
Semmissis summae	33 1059155	Semmissis summae	36 073323
Differenta Laterum	18 081461	Differenta Laterum	12 146646
Semissis differentae	9 0407305	Semissis differentae	6 073325

1. Operatio I.

			Logar. Sin.&Tang.	
Proport.	Sinus semissis summae laterum	33 1059155	. 9,73734,24996	
	Sinus semissis differentae laterum	9 0407305	. 9,19627,71847	
	Tangens compl.semissis anguli comprehensi	66 848990	. 10,36897,36696	
			19,56525,08543	sum.
	Tang. $\frac{1}{2}$ differentiae reliquorum angulorum	33 934033	. 9,82790,83547	differ.

Operatio II.

			Logar. Sin.&Tang.	
Proport.	Sinus compl.semmissis summae laterum	56 894085	. 9,92306,89855	
	Sinus compl.semissis differentae laterum	80 9592695	. 9,99457,09124	
	Tangens compl. simissis anguli comprehensi	66 848990	. 10,36897,36696	
			20,36354,45820	sum.
	Tangens simissis summae angulorum	70 065270	. 10,44047,55965	differ.
	Semissis differentiae reliquorum angulorum	33 934033		
	Summa	103 999303	Angulus ACD	
	Differentia	36 131237	Angulus ADC.	

2. Operatio I.

			Logar. Sin.&Tang.	
Proport.	Sinus semissis summae laterum	36 073323	. 9,76998,26167	
	Sinus semissis differentae laterum	6 073323	. 9,02449,00297	
	Tangens compl.semissis anguli comprehensi	71 934825	. 10,48653,42647	
			19,51102,42944	
	Tang. $\frac{1}{2}$ differentiae reliquorum angulorum	28 848643	. 9,74104,16777	

Operatio II.

		Logar. Sin. & Tang.
Proport.	Sinus compl.semmissis summae laterum 53 926677	. 9,90755,33018
	Sinus compl.semissis differentae laterum 83 926677	. 9,99755,55732
	Tangens compl. simissis anguli comprehensi 71 9343825	. 10,78653,42647
		20,78408,98379
	Tangens simissis summae reliquorum angulorum 75 150664	. 10,57653,65361
	Semissis differentiae angulorum 28 848643	
	Summa 103 999307	Angulus ADC
	Differentia 46 302021	Angulus ACD.

PROBL. 11

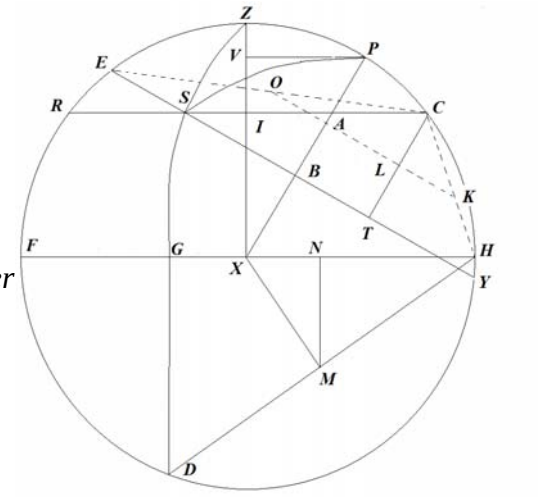
Datis singulis Lateribus, Quaeritur ANGULUS *quilibet.*

In Triangulo Obliquangulo ZPS quaeritur Angulus PZS

Datis Lateribus
- PS 42 146646
- PZ 30 000000
- ZS 26 065185

Termini Rationis.

Proport.
- *Rectangulum e Sinubus laterum angulum quaesitum comprehendentium.*
- *Quadratum Radii.*
- *Rectangulum e* $\frac{1}{2}$ *Sinibus summae* & $\frac{1}{2}$ *differ*
- *Basis* & *differentiae laterum eorundem.*
- *Quadratum Sinus* $\frac{1}{2}$ *anguli quaesiti.*



Illustratio Arithmetica.

1. Sumantur Sinus datorum laterum angulum quaesitum comprehendentium; eorumque Sinuum Logarithmi.
2. Sumantur quadratum Radii; eiusque Logarithmus.
3. Conferatur Basis, cum differentia laterum sive crurum, & sumutur semissis summae & semissis differentiae, earumque Sinus; & Sinuum Logarithmi.
4. Si factus primi, reliquorum factum diviserit ; quoti latus est Sinus semissis anguli quaesiti; vel si summa Logarithmorum primi, e reliquis auferatur; differentiae semissis est Logarithmus Sinus semissis anguli quaesiti.

Sint datorum Laterum { PZ 30 000000 ; ZS 26 065185 } Sinus { 50000,00000 ; 40777,57121 } Logar. { 9,69897,00043 ; 9,61042,13420 }

1. Rectangulum Sin.Lat.	203887856050000000000	Logar.summa .	19,30939,13473 A
2. Quadratum Radii	10000000000000000000	Log.Quadr.Radii	20,00000,00000 B

Basis	PS 42 146646
Differentia Crurum .	PC 5 934815
Summa Basis & differ.	EPC 48 081461
Diff.Basis & diff, Laterum	CY 36 211831

{ Semissis summae . . CO 24 040730 ; Semissis differentiae . CK 18 105915 } Sinus { 40738,59542 ; 31077,45544 } Log. { 9,61000,60492 ; 9,49244,54374 }

3. Rectangulum $\frac{1}{2}$ Sum. & $\frac{1}{2}$ diff.	126605188385323808480000 & c.	summa	19,10245,14866 C
4. Quotus est	62095023207836651 73 & c.	diff.	19,79306,01393 D

Quoti Latus est 7880069944 Sinus 51 999650 $\frac{1}{2}$ differ. 9,89653,00696

Aio itaque

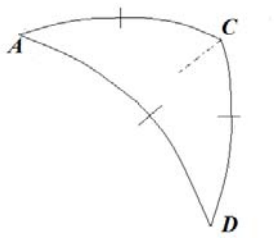
		Logar.Sinuum.
Proport. *Rectangulum Sinuum Crurum*	20388785605000 & c.	19,30939,13473 A
Quadratum Radii.	10000000000000 & c.	20,00000,00000 B
Rectangulum $\frac{1}{2}$ *sum.* & $\frac{1}{2}$ *differ.*	12660518838532380 & c.	19,10245,14866 C
Quadratum Sinus $\frac{1}{2}$ *anguli quaesiti*	620950232078366 & c. & diff.	19,79306,01393 D.

Quadrati latus est 788006944. Sinus 51 999650 . . . . .; $\frac{1}{2}$diff. 9,89653,00696
Huius arcus duplum videlicet 103 999300 est Angulum quaesitus PZS.

Quale ac quanti pretii sit compendium istud Logarithmicum, malim ut ex pro prio sensu quam meis verbis aestimet Trigonometer.

Aliter 2.

Subtrahantur logarithmi Crurum anguli quaesiti, e Logarithmi Quadrati Radii & semissis summae trium laterum & semissis differentiae Basis & summae Crurum : Reliquus erit Logarithmus Quadrati Sinus complimenti semissis anguli quaesiti ad Quadrantem.



Praecepti Illustratio Arithmetica.

In Triangulo Obliquangulo ADC quaeritur Angulus ACD

Datis Basi	AD	42 146646	*Logar.Sin.*
Cruribus	AC	30 000000	9,69897,00043
	CD	24 065185	9,61042,13430
			19,30939,13473 B Summa Logar.
			Radii dupl.Logar.
Summa Laterum		96 211831	. 20,00000,00000 E
Semissis summae		48 105915	. 9,87179,49769
Diff.Crurum & Basis		11 918539	
$\frac{1}{2}$Diff.Crurum & Basis		5 959269	. 9,01628,70114
			38,88808,19883 F summa.
			19,30939,13473 B
			19,57869,06410 Differentia B & F.
Logarithmus Sinus Gra.		38 000344	. 9,78934,53205 Semissis differentiae.

Huius arcus Complem. 51 999656.
Complem.arcus duplus 103 999312 est Angulus quaesitus ACD.

Aliter 3.

De dimidio collectorum laterum, latera Trianguli sigillatim subducantur, summaque Logarithmorum Sinuum semissis summae laterum & differentiae lateris angulum quaesitum subtendentis, auferatur e summa Logarithmorum Sinuum reliquarum differentiarum & duplicato Radii Logarithmo : semissis reliqui erit Logarithmus Tangentis semissis anguli quasiti.

Illustratio Praecepti Arithmetica.

Retineantur data cum quaesito superioris schematis.

Latera { AD . 42 146646 ; AC . 30 000000 ; CD . 26 065185 }

Laterum summa . . . 96 211831 *Logar.Sin.*

Semissis summae . . . . . 48 105915 . 9,87179,49769 }
Diff.1Basis AD & $\frac{1}{2}$summae 5 959269 . 9,01628,70114 } 18,88808,19883 summa.

Diff.2lateris AC & $\frac{1}{2}$summae 18 105915 . 9,49244,54374 }
Diff.3lateris CD & $\frac{1}{2}$summae 24 040730 . 9,61000,60492 } 19,10245,14866 }
Radii duplicatus Logar. 20,00000,00000 } summa.

39,10245,14866
18,88808,19883

Logarithmorum differentia 20,21436,94983
Semissis differentiae . . . 10,10718,47491

est Logarithmus Tangentis 51 999653.

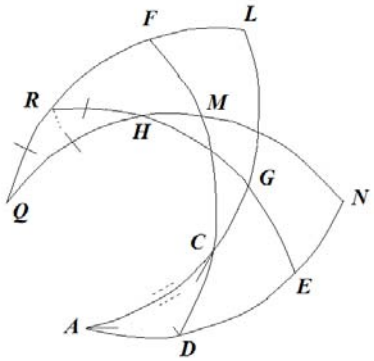
Huius arcum duplum 103 999306 est angulus quaesitus ACD.

PROBL. 12

Datis Angulis, Quaritur LATUS *quodlibet.*

In Triangulo Obliquangulo ADC quaeritur Latus AC

Datis Angulis
ADC . 103 999307
DAC . 36 131235
ACD . 46 302020



Problema istud conversum est undecimi, eundemque in modum solvitur, si modo anguli in latera permutentur. Duo enim Anguli minores semper aequantur duobus lateribus Trianguli comprehensi ab arcubus maiorum circulorum a polis eorundem ductorum. Tertius autem angulus esse potest maior quadrante, & idcirco complementum eius ad semicirculum sumi potest commodissime pro tertio latere. Angulus autem ubi inventus fuerit, erit unus e tribus quaesitis lateribus ; Inventis autem ex iisdem uno, reliqua per proportionis regulam *juxta Probl.* 1. invenientur.

Ut in triangulo ACD, horum arcuum poli sunt HRQ, & illius latera aequantur huius Angulis; AD aequalis angulo ad H vel arcui EN. DC angulo Q vel arcui MF. Et AC angulo HRF vel arcui GL. Idcirco si dati sint anguli ADC dantur latera QR, QH, RH. Angulus autem CDE vel MN aequatur lateri QH. Resolvatur itaque triangulum QRH, secundum praeceptum Problematis 11.

		Logar.Sin.	
Crura	RQ 46 302020	9,85913,31911	
	RH 36 131235	9,77058,45404	
Differentia Crurum . . .	10 170785	+ 19,62971,77315	Summa Logar.
Basis	QH 76 000693		
Summa Differentiae Crurum & Basis	86 171478		
Diff.Basis & differentiae Crurum	65 829908		
Semissis summae diff. Crurum & Basis	43 085739	9,83447,92046	
Semissis differ. Basis & differ. Crurum	32 914954	9,73511,44888	

19,56959,36934 sum.Logar.

Logarithmus duplicatus Radii 20,00000,00000

\+ 19,62971,77315

19,93987,59619 Diff.Logar.

Logarithmus Sinus $\frac{1}{2}$ Anguli HRQ 68 926676 9,96993,79809 Demiss diff.

Huius anguli duplum est 137 853352

Et anguli duplicati compl.ad semicirculii 42 146648 est Angulus GRL, cuius mensura est GL=AC Lateri quaesito.

Aliter 2.

Sunto data & quaesita ut supra. Aio

Proport.
- *Rectangulum e Sinubus crurum anguli quaesiti.*
- *Quadratum Radii.*
- *Rectangulum e* $\frac{1}{2}$ *Sinibus summae laterum & differentiae Basis & semisummae.*
- *Quadratum Sinus complementi semissis anguli quaesiti.*

Logar.Sin.

Crura
- RQ 46 302020 9,85913,31911
- RH 36 131235 9,77058,45404

Logar.Sin.

Crura
- RQ 46 302020 9,85913,31911
- RH 36 131235 9,77058,45404

Basis QH 76 000693 + 19,62971,77315 Summa Logar.

Summa Crurum & Basis 158 433948

Semissis summae crurum & Basis 79 216974 9,99226,30294

Differ. Basis & semissis summa 3 226281 8,74900,27530

8,74126,57824 sum.Logar.

Duplicatus Radii Logarithmus 20,00000,00000

\+ 19,62871,77315

Logarithmus Sinus anguli 21 073312 9,55577,40254

Complementum huius anguli 68 926688

Cuius duplum est QRH 137 853376

Et huius compl.ad semicirculum est 42 146624. Latus quaesitum AC.

Latera	QH .	76 000693		
	RQ .	46 302020		
	RQ .	36 131235		
Summa Laterum . . .		158 433948	*Log.Sinuum.*	
Semissis summae		79 216974	. 9,99226,30294	18,74126,57824 summa Log.
Diff.1lateris QH		3 216281	. 8,74900,27530	20,00000,00000 Radii dup.Log.
Diff.2lateris RQ		32 914954	. 9,83447,92046	
Diff.3lateris RH		43 085739	. 9,73511,44888	19,56957,36934 Summa Logarith.
				20,82832,79110 Differentia
				10,41416,39555 Differ. semissis est

Logarithmus Tangens $\frac{1}{2}$ anguli HRQ 68 926686

Cuius duplum est totus angulus 137 853372

Et huius Compl. ad semicirculum est 42 146628 cuius mensura LG=AC.

CAPUT V.

1. Ut omnia minimo cum labore fiant.

Si primus trium datorum proportionalium sit Sinus Totus vel Radius, addantur medii duo Logarithmi amputata prima versus sinistram nota; reliquus erit Logarithmus quaesitus.

Revocetur illustratio Probl.3.Cap.4.Planorum: & Probl.1.Cap.3 Sphaericorum.

		Logarithmi.			*Logarithmi.*
Prop.	*Radius* 90 0000	10,00000,0000	*Sinus Totus*	90 000 .	10,00000,00000
	Tangens 283300	9,73168,5536	*Sinus*	30 000 .	9,69897,00043
	Crus 11237943	3,05068,6815	*Sinus Hyp.*	51 076287 .	9,89097,02062
	Crus 6058601	12,78237,2351	*Sinus*	22 891768 .	19,58994,02104

2. Si primus datorum sit Sinus alius quilibet vel latus; Pro Logarithmo primi sumatur eius complementum Arithmeticum, quemadmodum praecepit doctissimus *D. Briggius* ad Cap. 15 Arithmeticae Logarithmicae ; & facta trium additone, auferatur unitas ad sinistram emergens.

Exempla mutuentur Prob l.Cap.4 Planorum, & Prob.2.Cap.3.Sphaericorum.

Prop.	*Crus*	1123$\underline{7943}$	3,05068,6815 *Log.* 6,94931,3185 *c.Ar.*		*Sinus*	67 $\underline{108232}$	9,96437,34001 *Log.* 0,03562,65999 *c.Ar.*
	Crus	605$\underline{8601}$	2,78237,2352		*Sin.Tot.*	90 $\underline{000000}$	10,00000,00000
	Radius	90 $\underline{0000}$	10,00000,0000		*Sinus*	38 $\underline{923713}$	9,79815,67532
	Tangens	28 $\underline{33}$	9,73168,5537		*Sinus*	43 $\underline{00000}$	9,83378,33531

Vel si primo loco ponatur Logarithmus Secants complementi arcus quartus eveniet : Quia Radius est medius proportionalis inter Sinuum & Secantem complementi : Et idcirco si e duplicato Radii Logarithmo auferatur Logarithmus dati arcus, prodibit Logarithmus Secantis complementi ; qui cum complemento Arithmetico congruit, si unitatem ad sinistram sitam excipias. Idcirco si Secantis Logarithmo utamur, post peractam additionem auferendus est binarius, ut patet

10,03562,65999	*Logar.Secantis*	22 $\underline{891768}$
0,03562,65999	*Compl.Arith.Log.*	67 $\underline{108232}$

3. Si primus trium datorum sit Tangens, substituatur eius complementum Arithmeticum ut supra, quemadmodum hic vides Exemplo Problematis. Cap.3 Sphaericorum.

Proport.	*Tangens*	30 $\underline{000000}$	9,76143,93726 *Log.Tang.* 0,23856,06274 *Compl.Arith.Log.Tang.*
	Radius	90 $\underline{000000}$	10,00000,00000
	Tangens	22 $\underline{891768}$	9,62556,69364
	Sinus	47 $\underline{000000}$	9,86412,74638

Vel sumatur Logarithmus Tangentis complemeti, qui ut ante fere idem est cum complemento Arithmetico, ut

Tangens Complementi arcus	60 $\underline{000000}$	10,23856,66274
Complementum Arithmeticum prius positum		0,23856,66274

Quia Radius mediam obtinet rationem inter Tangens arcus & complementi. Et idcirco si Logarithmus Tangentis auferatur e duplicato Radii Logarithmo, restabit Logarithmus Tangentis complementi.

4. Quod si numeri quatuor proportionales non exprimant lineas sed rectangular, ut cum datis tribus lateribus quaeritur angulus aliquis, vel contra ; sumi poterunt complementia Arithmetica pro utroque Logarithmo primi rectanguli ; quod si fiat, omnia per solam additionem perficiuntur. Examplis utamur Problematis 11. Cap.4.

Crura	*PZ*	30 000000	*Log.Sin* 9,69897,00043	*Compl.Arith.*	0,30120,99957
	ZS	26 067185	*Log.Sin* 9,61042,13430	*Compl.Arith.*	0,38957,86570
		Semissis summae	24 040730		9,61000,60492
		Semissus differentiae	18 105915		9,49244,54374
					19,79306,01393
		Semissis summae, ut supra			9,89653,00696

Log.Sinuum.

Semissis summae laterum	48 105915	9,87179,49769	*Compl.Arith.*	0,12820,50341
Differentia prima	5 959269	9,01628,70114	*Compl.Arith.*	0,98371,29886
			Differentia secunda	9,49244,54274
			Differentia tertia	9,61000,60492
			Summa	20,21436,94983
			Semissis summae, ut supra	10,10718,47491

Hic sumantur Complementa Arithmetica pro duobus primis Logarithmis; Quia hi duo inserviunt primo Rectangulo e quatuor proportionalis, atque omittitur Logarithmus duplicati Radii pro substractione binarii e summa quae proveniret ex additione quinque Logarithmorum : quemadmodum admonuit D.Briggius, nosque in publicis nostris praelectionibus Astronomicis saepissimc ostendimus.

lntegram Eclipsium doctrinam quam in apparatu habeo, coronidis loco subnectere statuissem, qui usum Triangulorum tam Planorum quam Sphaericorum copiose exhibeo, si modo per Typographi festinationem ac temporis angustias ultimam manum imponere licuisset. De istis autem (si DEUS volet) in sequentibus.

FINIS.