$$s = 40^\circ$$
eritque
$$\begin{array}{rcl} l.\,40 & = & 1,6020600 \\ \text{fubtrahe} & & \underline{1,7581226} \\ l.\,Arc.\ 40^\circ & = & 9,8439374 \\ & \text{at eft} & \\ l.\,cof.\,40 & = & 9,8842540 \end{array}$$

hinc intelligitur Arcum quæfitum aliquanto majorem effe quam 40°, hancque ob rem fingamus $s = 45^\circ$, erit

$$\begin{array}{rcl} l.\,45 & = & 1,6532125 \\ \text{fubtrahe} & & \underline{1,7581226} \\ l.\,Arc.\,45^\circ & = & 9,8950899 \\ & \text{at eft} & \\ l.\,cof.\ 45^\circ & = & 9,8494850 \end{array}$$

continetur ergo angulus quæfitus inter 40°, & 45°: atque adeo hinc proxime definiri poterit. Nam, pofito $s = 40^\circ$,

$$\begin{array}{rl} \text{eft error} = & + 403166: \\ \text{pofito autem } s = 45^\circ, & \\ \text{eft error} = & -\underline{456049}, \\ \&\ \text{differentia} = & 859215, \end{array}$$

Fiat ergo ut 859215 ad 403166 ita differentia hypothefium 5° ad exceffum Arcus quæfiti fupra 40°, unde Arcus quæfitus major fit quam 42°, limites enim illi nimis funt remoti, quam ut exactius definire queamus. Sumamus ergo limites propiores

LIB. II.

	$s = 42°$	$s = 43°$
$l.s =$	1,6232493	1,6334685
subtrahe	1,7581226	1,7581226
$l.s =$	9,8651267	9,8753459
	& est	& est
$l.\,Cos.s =$	9,8710735	9,8641275
	+ 59468	— 112184
	112184	

$$171652 : 59468 = 1° : 20', 47''.$$

Arctissimos ergo obtinuimus limites $42°, 20'$, & $42°, 21$ intra quos verus ipsius s valor contineatur. Hos angulos ad minuta prima revocemus

	$s = 2140'$	$s = 2541'$
$l.s =$	3,4048337	3,4050047
subtrahe	3,5362739	3,5362739
$l.s =$	9,8685598	9,8687308
$l.\,cos.s =$	9,8687851	9,8686700
	+ 2253	— 608
	608	

$$2861 : 2253 = 1' : 47'', 14'''$$

Hinc concludimus Arcum quæsitum, qui suo Cosinui sit æqualis, fore $= 42°, 20', 47'', 14'''$, hujusque Cosinus, seu ipsa longitudo, erit $= 0,7390847$. Q. E. I.

TAB. XXVIII Fig. 112. 532. Sector Circuli ACB a Chorda AB in duas partes secatur, Segmentum AEB & triangulum ACB, quorum illud hoc minus est si angulus ACB fuerit exiguus, majus autem si angulus ACB sit admodum obtusus. Dabitur ergo casus, quo Sector ACB per Chordam AB in duas partes æquales secatur, unde nascitur.

PROBLEMA II.

Invenire Sectorem Circuli ACB, *qui a Chorda* AB *in duas partes æquales secetur, ita ut Triangulum* ACB *æquale sit Segmento* AEB.

SOLUTIO

SOLUTIO.

Poſito Radio $AC = 1$, ſit Arcus quæſitus $AEB = 2s$, ut ſit ejus ſemiſſis $AE = BE = s$: ducto ergo Radio CE, erit $AF = \mathit{ſin}.s$, & $CF = \mathit{coſ}.s$: Unde fit Triangulum $ACB = \mathit{ſin}.s.\mathit{coſ}.s = \frac{1}{2}.\mathit{ſin}.2s$; & ipſe Sector ACB eſt $= s$, qui cum æquari debeat duplo Triangulo, erit $s = \mathit{ſin}.2s$; ideoque Arcus quæri debet, qui æqualis ſit Sinui Arcus dupli. Primum quidem patet angulum ACB recto eſſe majorem; ideoque s ſuperare $45°$, unde ſequentes faciamus hypotheſes

	$s = 50°$	$s = 55°$	$s = 54°$
$l.s =$	1,6989700	1,7403627	1,7323938
ſubtrahe	1,7581226	1,7581226	1,7581226
	9,9408474	9,9822401	9,9742712
$l.\mathit{ſin}.2s =$	9,9933515	9,9729858	9,9782063
	+ 525041	− 92543	+ 39351
	92543		
	617584 : 525041 = 5° : 4°, 15′		

Erit ergo propemodum $s = 54°, 15'$: unde ad ſuperiores hypotheſes addamus $s = 54°$, & ex erroribus concludetur $s = 54°, 17', 54''$, qui valor a vero minuto integro non diſcrepat: faciamus ergo ſequentes poſitiones minuto tantum diſcrepantes

$s =$	54°, 17′	54°, 18′	54°, 19′
	ſeu	ſeu	ſeu
$s =$	3257′	3258′	3259′
	&	&	&
$2s =$	108°, 34′	108°, 36′	108°, 38′
compl. =	71°, 26′	71°, 24′	71°, 22′
$l.s =$	3,5128178	3,5129511	3,5130844
ſubtrahe	3,5362739	3,5362739	3,5362739
$l.s =$	9,9765439	9,9766772	9,9768105
$l.\mathit{ſin}.2s =$	9,9767872	9,9767022	9,9766171
	+ 2433	+ 250	− 1934
		1934	
		2184	

fiat ergo $2184 : 250 = 1' : 6'', 52'''$

 Hinc erit $s = 54°, 18', 6'', 52'''$. Si hunc angulum accuratius determinare velimus, majoribus tabulis uti oportet; unde faciamus ſequentes hypotheſes $10''$ differentes

$$\begin{array}{rl|rl}
s = & 54°, 18', 0'' & s = & 54°, 18', 10'' \\
 & \text{ſeu} & & \text{ſeu} \\
s = & 195480'' & s = & 195490'' \\
2s = & 108°, 36', 0'' & 2s = & 108°, 36', 20'' \\
compl. = & 71°, 24', 0'' & compl. = & 71°, 23', 40'' \\
l.s = & 5,2911023304 & & 5,2911245466 \\
\text{ſubtrahe} & 5,3144251332 & & 5,3144251332 \\
\hline
 & 9,9766771972 & & 9,9766994134 \\
l.ſin.2s = & 9,9767022291 & & 9,9766880552 \\
\hline
+ & 250319 & - & 113582 \\
 & 113582 & & \\
\hline
 & \multicolumn{3}{l}{363901 : 250319 = 10'' : 6'', 52''', 43'''', 33'''''.}
\end{array}$$

Erit ergo $s = 54°, 18', 6'', 52''', 43'''', 33'''''$;
ideoque angulus $ACB = 108°, 36', 13'', 45''', 27'''', 6'''''$,
ejuſque complementum $= 71, 23, 46, 14, 32, 54$,
cujus ſinus Logarithmus, ſeu

$l.\,ſin.\,2s = 9,9766924791$,

& ipſe

ſinus $= 0,9477470$.

Deinde erit

$ſin.\,s = AF = BF = 0,8121029$,

ideoque ejus duplum, ſeu

Chorda $AB = 1,6242058$.

Præterea vero erit

Coſinus $CF = 0,5335143$.

Sicque vero proxime Sector quæſitus conſtrui poterit. Q. E. I.

533. Simili modo determinari poteſt Sinus, quo Circuli quadrans in duas partes æquales ſecatur.

Problema III.

Tab. XXVIII Fig. 113. *In quadrante Circuli* ACB *applicare Sinum* DE *qui Aream quadrantis in duas partes æquales biſecet.*

Solutio

SOLUTIO.

Sit Arcus $AE = s$; erit $BE = \frac{\varpi}{2} - s$, ob $AEB = \frac{\pi}{2}$; & Area quadrantis $= \frac{1}{4}\pi$. Jam Area Sectoris ACE est $= \frac{1}{2}s$, a qua Triangulum $CDE = \frac{1}{2}.\mathit{fin.s.cof.s}$ subtractum relinquet spatium $ADE = \frac{1}{2}s - \frac{1}{2}.\mathit{fin.s.cof.s}$, cujus duplum dare debet quadrantem: ex quo erit $\frac{1}{4}\pi = s - \frac{1}{2}.\mathit{fin.}2s$: ergo $s - \frac{1}{4}\pi = \frac{1}{2}.\mathit{fin.}2s$. Ponatur Arcus $s - \frac{1}{4}\varpi = s - 45° = u$: erit $2s = 90 + 2u$; ideoque esse oportet $u = \frac{1}{2}.\mathit{cof.}2u$, & $2u = \mathit{cof.}2u$. Cum ergo Arcus requiratur, qui suo Cosinui æquetur, cumque problemate primo invenerimus, erit $2u = 42°, 20', 47'', 14'''$, & $u = 21°, 10', 23'', 37'''$. Quocirca erit Arcus $AE = s = 66°, 10', 23'', 37'''$, & Arcus $BE = 23°, 49', 36'', 23'''$. Hinc erit Radii pars $CD = 0\ 4039718$, & $AD = 0{,}5960281$, atque Sinus $DE = 0{,}9147711$. Hoc ergo modo, quo Circuli quadrans bisecatur, totus Circulus secabitur in 8 partes æquales. Q. E. F.

534. Quemadmodum Circulum omnis recta per Centrum ducta bifariam secat, ita ex quovis Peripheriæ puncto rectæ educi poterunt, quæ Circulum in tres pluresve partes æquales secent. Inquiramus in quadrisectionem, ac resolvamus.

PROBLEMA IV.

Proposito semicirculo AEDB *ex puncto* A *educere Chordam* AD *quæ Aream semicirculi in duas partes æquales secet.* Tab. XXVIII Fig. 114.

SOLUTIO.

Sit Arcus quæsitus $AD = s$; ductoque Radio CD, erit area