IO. BAPTISTAE PORTAE NEAPOLITANI

ELEMENTORVM CVRVILINEORVM LIBRI TRES.

In quibus altera Geometriæ parte restituta, agitur de CIRCVLI QVADRATVRA.

Ad Illustrissimum Principem ac D.

D. FEDERICVM CAESIVM

MONTIS CAELII MARCHION. II. &c.

BARONEM ROMANVM.

ROMAE,

Apud Bartholomæum Zannettum. M. DC. X.

SVPERIORVM PERMISSV.

Imprimatur si videbitur R. P. M. Sac. Pal. Apost.
Cæsar Fidelis Vicesg.

Libri tres Elementorum Curuilineorum Perillustris & Excellentissimi D. Ioannis Baptistæ Portæ Neapolitani, ex ordine Reuerendissimi P. Magistri F. Ludouici Ystella Sacri Palatij Apostolici Magistri perlegi, eosque cum nihil fidei, vel moribus aduersum continere inuenerim typis dignos existimaui. Romæ Die 20. Iulij 1610.

Antonius Butius Faventinus Ciuis Romanus Philosophiæ & Medicinæ Doctor.

Imprimatur. Fr. Damianus à Fonseca magister, & Socius Reuerendissimi P. Magistri Fr. Ludouici Ystella, sacri Palatij Apostolici Magistri, Ordinis Prædicatorum.

In Clarissimum ac Doctissimum Virum

IO. BAPTIST. PORTAM NEAP. LYN.

& in librum de Circuli Quadrato.

Ioannis Demisiani Cephalleniensis D. Philosophi ac Theologi.

ΗΜΟΣ ἐοῖς ἐπέεσσι πολύχροα Δαίδαλα ΠΟΡΤΗΣ
Φαίνει, τοῖς θαλέθει γαῖα πυκαζομένη.
Οὔατι θαμβαίνουσα βιαρκεῖ μῦθον ἀκούει,
Καὶ σφετέρης γ' αἰεὶ φέγγεσιν ἀγλαΐης.
Ἀτρυγέτου βάζοντος ἀπείριτα θαύματα πόντου,
Σιγαλέη πόντος νηνεμίῃ γελάᾳ.
Ἠέρος αἰγλήεντος ὅταν χύσιν αὐτῆς ἐνίσπει,
Ἶσον ἀπαστράπτει δώμασιν οὐρανίων.
Αἰθέρος ἀστροχίτωνος ἀτειρέα νῶτα πιφάσκει,
Καὶ Πόλος ἠρεμέων οὐδ' ἑτέρωσε θέει.
Κύκλα δέ, καὶ Τετράγωνα, Τρίγωνά τε, Πρίσματα, Κώνους,
Καὶ γραμμὰς μετρεῖ, κέντρα τε πυραμίδων.
Ὅσσα τε πὰρ Νείλου προχοῆς μητίσατο τέχνῃ
Ἀΐα δαιτρεύων Ἠερίης ναέτης.
Αὐτὴν νῦν Σοφίη πολυμήχανα δήνεα τεῦ,
Ὕδωρ πρηῢ ῥέον Νεῖλος ἐρυκακέει.
Ἔδρακε γὰρ Τετράγωνα πάρος πολεμήϊα Κύκλοις,
Ὅρκια συνθεσίης, καὶ φιλίης ταμέειν.
Ἔδρακε, καὶ θάμβησεν ὅπερ χρόνος ὀψὲ φαείνειν
Ἤμελλε, ζαθέων ἠΰ τέκος πραπίδων.
Ἄλλον ἐγὼ Κρονίδη δώσω πολυΐδμονα ΠΟΡΤΗΝ,
Ἢν ἡμῖν ἄλλην Παρθενόπην ὀπάσῃς.

FRANCISCI STELLVTI
FABRIANENSIS.
LYNCÆI.

Vidimus innumeras mutantem Protea formas,
Credite, nam veri Nuncia Fama canit.
Tortilis en Orbis species se vertit in omnes,
Et QVADRVM teretes efficit arte rotas.
Dicite Pierides quo tandem munere factum?
Aut nostro, aut PORTÆ. visq. laborq. pares.

ILL.

ILL.^MO^ PRINCIPI AC D. D.

FEDERICO CAESIO
MONTIS CAELII
MARCHIONI II.

Io. Baptista Porta Neapolitanus. S.

CERTAMVS inter nos, Illustrissime Vir, tu beneficijs, ego officijs; quibus ęquo animo vel vincar abs te, vel, si fieri posset, vincam te. Et sanè grauis ista contentio nullum vnquam finem habitura videtur. Summis me ornas laudibus, meos libellos plausu, nedum honore prosequeris, &, quod caput est, iacentes aliquando, ac mox improborum impetu proterendos, erigis & defendis; quæ quidem merita ita in memoria insederunt mea, vt mei ipsius potiùs, quam illorũ erga me magnitudinis obliuio capiat. Ego verò si titulos percensere velim, quibus tuũ animum virtus cohonestauit, splendorem domus, quam

„ Bellipotens illustrat Auus, Tu fulcis, & ornas.

aliaq. ornamenta, quibus te natura mirificè cumulauit; & vires, & vita me deficeret. quid? ipsam Inuidiam ad maxima quæque, ac pulcherrima labefactanda natam, virtute superasti.

„Est

„ Eſt aliquod meriti ſpatium, quod nulla furentis
„ Inuidiæ menſura capit.

Sed non eſt animus in præſentia laudes enumerare tuas. maioris id molis eſt. leuiter, at amanter tetigiſſe ſatis; neque enim qui Cœleſtium Orbium ornatum in parua deſcribunt tabella, de illorum pulchritudine quicquam demunt; parua, vt ita dicam, ſed concinna magnitudo. Quid igitur mirum ſi certos fines, terminosq. huic ſuauiſsimæ concertationi non conſtituo? Non patitur mea in te obſeruantia Victoriam. Tu, quæ tua eſt magnanimitas, cedere neſcis. Eſto lis ſub te Iudice. Tu te vince

„ Inq. animis hominum pompa meliore triumpha.

meum certè quidem tibi deuinxiſti, ac deuiciſti. Non excitabo teſtes ex monumentis, quæ in manus peruenerunt Sapientum. Sit hic liber tuo inſignitus nomine, amoris, ac venerationis in te meæ pignus ſempiternum. Circulum quadrare conatus rem ſcilicet aggreſſus in eruditorum identidem commemoratam comitijs, in Philoſophorum agitatam ſcholis, in Mathematicorum iactatam iudicijs. Multos in hoc Theoremate me labores exantlaſſe, curas, & cogitationes euigilaſſe meas, ac pertinaci induſtria deſudaſſe, non inficias iuerim. An verò modum quadrandi Circuli inuenerim, ſicq. præmium, & fructuum meorum cœperim laborũ, non facile ſtatuerim. Id ſaltem aſſecutus mihi videor. Latiſsimum aperuiſſe campum ad meliora vel inueſtiganda, vel inuenienda. Verecundè tamen dixerim, plurima nos excogitaſſe, multa in diſquiſitionem vocaſſe, ſuisq. examinaſſe ponderibus, quæ nemo vſque in hodiernum diem odoratus quidem eſt. Immo, vt id quod ſentio, aperiam, opus magnis viris tentatum, ac tandem deſperatum, aut inchoauimus, aut perfecimus. nihil tamen in tanto, ac tali negocio pro certo affirmarim, te, non aſſentiente, tuæ enim Παλλάδος ὑπὸ πτεροῖς ὄντα ἄζονται βροτοί. tuo iudicio, ac patrocinio fultus, non inmorabor τοὺς γεφυριστάς. Tenes, opinor, memoria, incomparabilis vir, Epheſiorum factum. Illi dum hoſtili vexarentur bello, de rei euentu conſuluerunt Oraculum. datum reſponſum, ſi Rempublicam ſartam tectam cuperent, ad Tutelaris Numinis Templum Vrbẽ alligarent; quo peracto, hoſtes in fugam verterunt, Epheſumq. obſidione, ac metu liberarunt. Multi iam cogitant noſtra obſidere inuenta, machinas admouent, ac penè labefactant: ſed meus Apollo dudum me commonefecit, vt me meaq. tui Genij vinculis obſtricta, aduerſariorum impetus reprimam, ac frangam. Tuere igitur, Heros, litterarum, ac litteratorum Cenſor, quæ tibi dicata ſunt, eo vultu, quo intuentium allicis animos. Habes à Philoſophia non minora clementiæ, quam iudicij præſidia; vt illa nouos hoſce foueas conatus, hoc vt defendas. Vale, tecumq. creſcat tuæ Gentis ſpes, Patriæ columen, litterarum decus, meæ Neapoleos amores, Italiæ gloria. Kal. Iulij M.DC.X.

AD

AD LECTOREM
PRAEFATIO.

NON immeritò, Candide Lector, admirari satis non possumus de viris quibusdam omni doctrinæ genere cumulatis, qui, cum mathematicas tractationes sibi assumpserint, atque in ijs cum laude versati, sint, de illa parte, quæ curuas complectitur lineas, nihil ferè commentati, aut meditati sint. In quadrando quidem certè Circulo (re scilicet æquè decantata, atque ardua) plerique ingeniosi viri desudarunt, & elaborarunt rectè ne, an secus, ipsi viderint. Ego qui noui aliquid moliri, non aliorum labores veluti fucus surripere studeo, eandem quidem subiui aleam. Sed ut legitimè & expeditius id præstarem, multa ex Euclideis elementis ad propositum argumentum transtuli, ac plurimas confeci demonstrationes, ex quibus, aliquas, quæ ad rem facere videntur se legi, easq. vti curuilinearum figurarum elementa proposui. Hinc ad perdifficilè Theorema de quadrando Circulo, progressus sum. quid vero effecerim in re multis circunfusa tenebris, & in quà summorum virorum ingenia errare potius, quam hærere visa sunt, aliorum esto iudicium. si perfectionem non sum omnino assecutus, conatus certè, & adumbratio tanti Theorematis laudandus.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Primus.

DEFINITIONES.

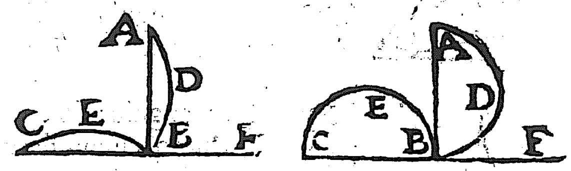
PRIMA.

LINEA curua est, quæ inter sua nō æquè fluit puncta, sed facto sinu flectitur.

II.

Angulus flexilineus est flexarum linearum retusio suo nutu sibi coincidentium.

III.

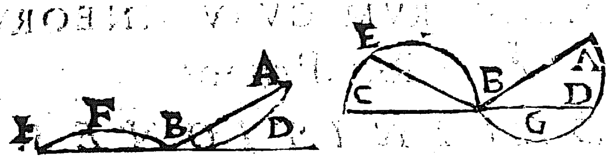


Angulus flexilineus rectus, qui rectilineo respondet.

Exempli causa sit A.B. insidens linea iacens FBC. vtrobiq. sibi æquales constituens angulos ABF, ABC. sitq. AB. ipsi B.C. æqualis & ipsi AB. hemicyclium circumscribatur ADB. vel circuli portio, & ipsi BC. alter B. E C. vel æqualis circuli portio. Cyclogoni ergo DBA. CBE. sunt æquales, & quanto angulus AD.B.F. maior est recto ipso contingentiæ angulo DBF. tanto ABE. superat ipsum ABC. altero contingentiæ angulo ABE.

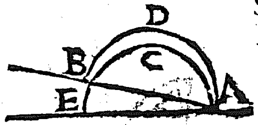
totus igitur ADBEC. toti ABC. recto æqualis, vt probauit Proclus in Eucl.

IIII.



Obtusus curuilineus, qui obtuso rectilineo fit quando à recto resupinata in maiorem angulum abit.

Eodemq. modo angulū ADB. FE. flexilineum, rectilineo ABE, esse æquale flexilineus angulus FBE. est æqualis flexilineo DBG. nàm æquales sunt circulorum portiones, si angulum DBG. abstuleris, & reposueris supra EB. erit rectilineus DBE. æqualis flexilineo DGBFE.



Sic etiā semicirculus ADB. æqualis est ACE, dematur portio communis ABC. remanet angulus CAD. æqualis rectilineo BAE.

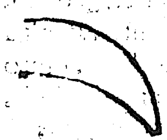
V.

Xystroides angulus siue concauus quando vtrarumq. circumferentiarum caua extra fuerint, & intus se respiciens conuexitatibus suis.

VI.

Contra conuexus angulus quando circumferentiarum conuexa vtrinq. extra fuerint, & inter se suis finibus aspexerint.

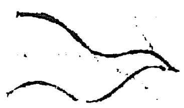
VII.



Angulus μηνοειδής. siue lunaris, qui ex caua conuexavè circumferentia fuerit, vt conuexum vnius alterius conuexitatem aspiciat.

Cys-

VIII.

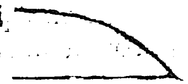


Cyssoides Angulus ex hederæ folijs nomen indeptum ex gibbosis, cauisq. lineis constat ad punctum vnum conuenientibus, vndatim contra se discurrentibus veluti Vndulatus.

IX.

Mixtus angulus, qui ex rectis circulosisq. lineis componitur.

X.



Cyclogonus, qui à Caua, & recta circuli circumferentia constat.

XI.

Κερατοειδής. siue in cornua falcatus, quando rectæ opponitur conuexa nostri contingentiæ vocant.

XII.

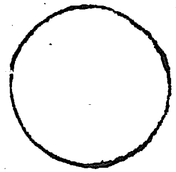
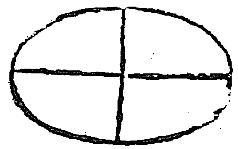


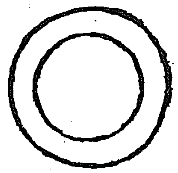
Figura vel angulosa, vel agonia, agoniarum figurarum circulus princeps, lineæ partem, quæ ambitiosè circumuoluitur, & aream obambit concauum dicimus, quæ extorsum inuehitur conuexum.

XIII.



Sphærois siue Ellipsis ex ambienti linea in se recursa describitur vnius duæ diametri, longitudinis vna longior, latitudinis altera ad rectum in medio se secantes.

XIIII.

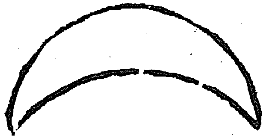


Vertex. siue corona est duorum circulorum concentricorum circumcursus.

XV.

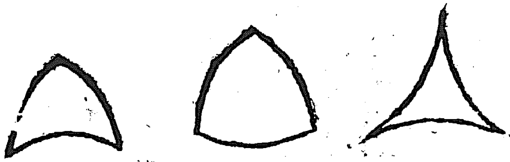
Angulosarum figurarum metriscus siue

A 2 lu-



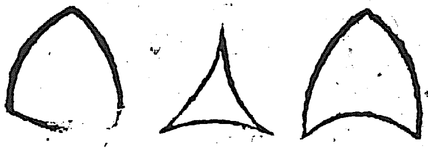
lunula prior, estq. in easdem partes caua habentibus comprehensa circumferentijs figura.

XVI.

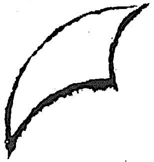


Trilaterarum figurarum flexilinearum triangulum primum est, quod tribus constat ijsdem æqualibus circumferentijs circuli, idq. conuexum, concauum, vel mixtum.

XVII.



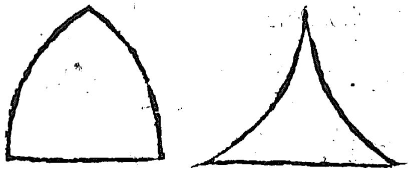
Isoscele triangulum curuilineum, quod duabus tãtum æqualibus circuli circumferentijs continetur, idq. etiam conuexum, vel concauum, vel mixtum.



XVIII.

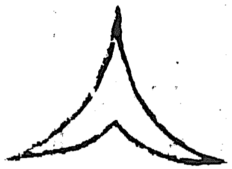
Scalenum flexilineum est, quod tribus inæqualibus circuli circumferentijs clauditur, ijsq. cauis conuexis, & mixtis.

XIX.



Semicuruilinea triangula sunt, quæ ex rectis, curuisq. circumferentijs continentur.

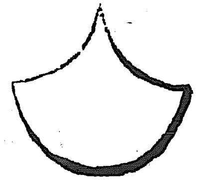
XX.



Tricuspidatum triangulum, siue acioidea quadrilaterum est triangulum quod tres habet acutos angulos.

XXI.

Inter triangulares figuras πελεκοειδής. Figura est, quæ securis vel bipennis formã habet.



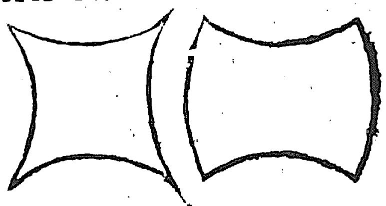
Eius Theocritus meminit. Nicandri Scholiastes sutorium scalprum. Τὰ κυκλοτερῆ σιδήρεια, οἷς οἱ σκυτοτόμοι τέμνουσι καὶ ξύουσι τὰ δέρματα. Idest circularia ferramenta quibus pelles incidunt, & deradunt.

XXII.

Arbilones ex tribus circumferentijs compræhensi; Horum meminit Pappus spatium illud inter circumferentias interiectum ἄρβηλον vocans.

XXIII.

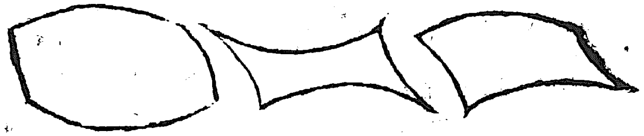
Quadrilaterarum quidum figurarum curuilinearum quadratum quidem flexilineũ est, quod rectis angulis, & æqualibus circumferentijs perscribetur.



XXIIII.

Rhombus flexilinea æquilatera quidem, sed non rectangula, aduersos tamen angulos æquales habet, eorumq. aliquos concauos, conuexos, & mixtos.

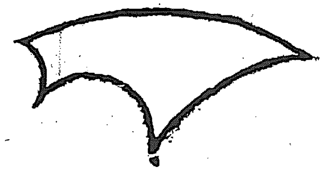
XXV.



Rhomboides vero neutrum horum habet neque laterum, neque angulorum æqualitatem, ſed contrarias circumferentias, & angulos æquales habet ſimiliter etiam concauus, conuexus, & mixtus.

XXVI.

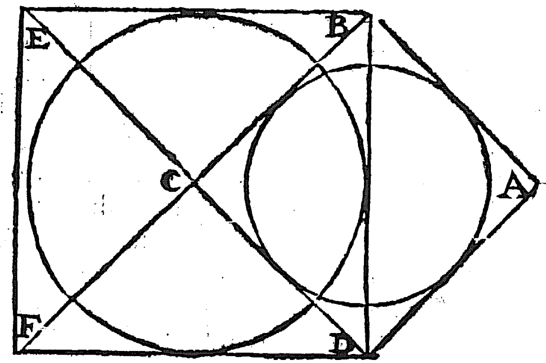
Trapezoides curuilineum, quod quatuor inæqualia latera ex diuerſis circumferentijs habet.



PROBL. I. PROP. I.

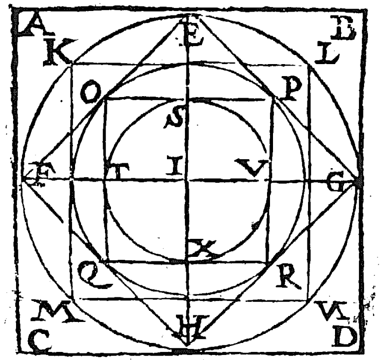
Datum circulum duplare.

SIT datus circulus A B C D. cuius oportet duplum inueſtigare. Deſcribatur quadratum per 7. 4. Eucl. & ſit A B C D. ducto Diagonio B D. ſecundum datum B D. deſcribatur quadratum per 48. 1. Euclidis, & ſit B E D F. cui circulus inſcribatur per 6. 4. dico circulũ. BDFE. eſſe dati duplum. Hanc



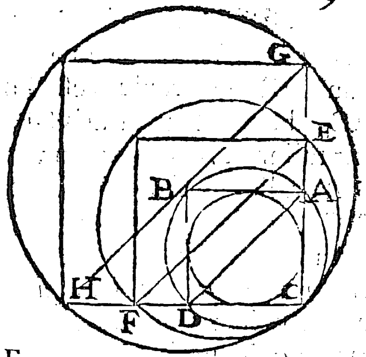
conſtructionem demonſtratione fulciendam rati ſumus. quoniam B C D. rectus eſt angulus proinde cum quadrata lateris B C. C D. æqualia ſint quadrato ex B D. ex 47. 1. ergo quadratum ex B D. duplum quadrati A B C D. ſed ex B D. deſcriptum quadratum eſt D B F E, ergo quadratum BDEF. duplum ipſius A B C D. ſed circulus ad circulum eandem rationem habet, quam quadratum inſcriptum, aut circumſcriptum, vt ex Euclidea demonſtratione ratum eſt duodecimi elementorum ſecunda, ergo circulum ABCD. duplauimus per circulum BEFD.

Plato ita quadratum duplat vt à Vitruuio annotatur. Dimidium quadrati B D C. eſt quarta pars quadrati BEF. ergo quadratum BEDF. duplum eſt ABCD.



Poſſumus, & alio modo circulos duplare, ſi circa datum circulum quadratum induxeris, & poſt circa quadratum circulum, & circa circulum aliud quadratum eodem modo alios circulos ſemper duplicabis. Sed quo iuuenes rectius imaginari, & capere poſſint exemplo duximus declarandum. Eſto datus circulus STVX. quem oportet conduplicare, huic quadratum circumſtruemus OPQR. cuius latera duabus diametris ſe ad centrum I, decuſſantibus bipartiemur, & circa quadratum OPQR. circuculus alter deſignetur mox aliud quadratum. K. L. M. N. & alter circulus, ac demum aliud quadratum ABCD. quod poſtremum circulum KLMN. intercludat. His perſtructis aio aream inter circuli KLMN. finitionem concludam proximè ſepientis arctioris ſui circuli OPQR. duplam eſſe, vt laxior poſtremi area eius, qui minimum intercludit quadrupla ſit, & ſic in infinitum duplare poſſumus cuius veritas hac demonſtratione repræſentabitur. Quoniam linea AB. bifariam diuiſa eſt in E, quadratum ABCD. quadruplum eſt ipſius AE, & ſic in quatuor quadrata æqualia AI, EG, FH, ID. & hæc à quatuor diagonijs bifariam diuiſa ſunt EF, FH, HG, GE, quatuor igitur triangula extrinſeca FAE, EBG, GDH, HCF. quatuor interioribus æqualia ſunt; ergo totum quadratum ABCD. quadrati E. F. G. H. duplum erit, eademq. ratione quadratum EFHG. ipſius O. P. Q. R. duplum erit, & primum A. B. C. D. huius quadruplum.

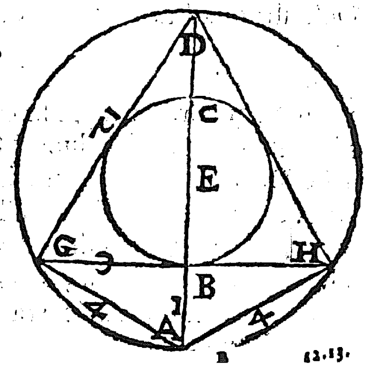
Anni-



Annitemur etiam per quadrata dupla ambientia idem rimari, & abſoluere. Eſto datus circulus ABCD, cui quadratum ABCD. circumſtruimus: mox ab oppoſitis angulis ducto diagonio AD & à puncto C, ſuperne verſus A, ſigna lineam eiuſdem longitudinis ipſius AD, & ſit CE, & ex parte inferiori ſit CF, mox trahe diagonium EF; & iterum quanta EF, figura in linea CG, & inferne linea CH, & id toties repetendum quoad ſatis videbitur. Sic quadratum ex GH, duplum eſt quadrati EF, & quadratum EF, duplum AD, & AD, duplum AC. Sed quod exprimit figura, demonſtremus. Quoniam quadratum AD, eſt æquale quadratis AC, CD, & AC, CD, latera æqualia ſunt, ergo quadratum ex A, duplum eſt quadrati AC, ſed AD, eſt æquale EC, ergo quadratum EC, eſt duplum AC. Sed quia EF, eſt æquale duobus quadratis EC, CF, & EC, CF, æqualia ſunt, ergo quadratum ex EF, duplum eſt EC. Eodem modo GH, duplum ipſius AC, & ſi idem varijs modis aſſequi poſſet, tanquam ſuffecturos reliquos cenſuimus miſſos facere.

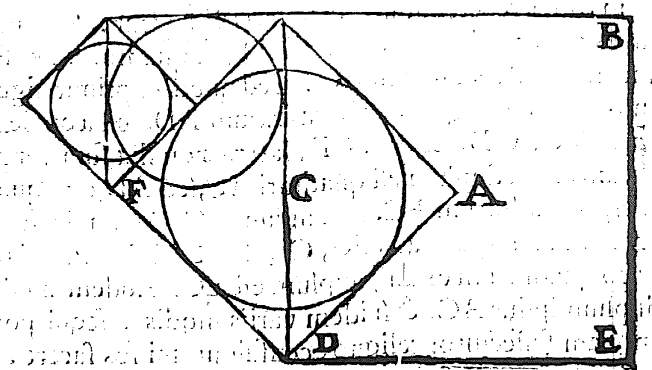
Libet non prætermittere, alium quadruplandi modū.

Sic circulus BC, quem intendimus quadruplare circa quem æquilaterum triangulum per tertiam quarti deſcribamus, & circa illud alium circulum per quintam eiuſdem quem quadruplum pronunciamus. Quoniam DG, tripla eſt ipſius GA. ex



B 12.13.

12. 13. si quadratum D G, erit duodecim partium talium GA, erit 4. & quadratum G B, erit talium 3. nam quadratum G D, quadruplum est G B, suæ dimidiæ, sed quadratum AG, est æquale quadratis GB, BA, igitur si quadratum G A, erit talium 4. & quadratum GB, talium 3. erit quadratum B A. talium I, sed A E, erit quatuor, quoniam est æqualis A G. & quando quadratum totum 4. est, & sui pars 1. erit linea per medium diuisa ergo AB. ipsius AE. dimidium erit, ergo tota AD. ipsius EB. quadrupla est. Si vero circulum diuidere voluerimus, poterimus conuersa vti operatione; Et si facilia quidem sint, quo tyrones iuuemus alium modum apponere non pigebit.



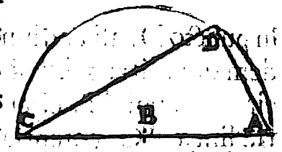
Describe quadratum tantæ quantitatis quantæ duplarem circulum diuidẽdum fieri cupis, & sit ABCDE. cuius medio fige punctum A. super quo ambitiosa linea circumducatur, quæ omnia quadrati tangat latera, deinde annecte literas rectas à centro ad angulos duos AC. CD. & constitue triangulum ACD. & aliud priori par triangulum constitue cuius angulus F. erit rectus est igitur ACDF. secundum quadratum primi dimidium. In medio puncto huius diagonij CD, qui sit G. pone pedem circini, & reliquo vago describe circumferentiam tangentem sui latera quadrati ACDF. & hoc modo

do in infinitum poteris circulos dimidiare. Demonstratio ex superiori pendet.

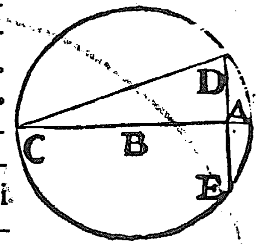
Datum circulum triplicem quintuplicem, & septuplicem reddere.

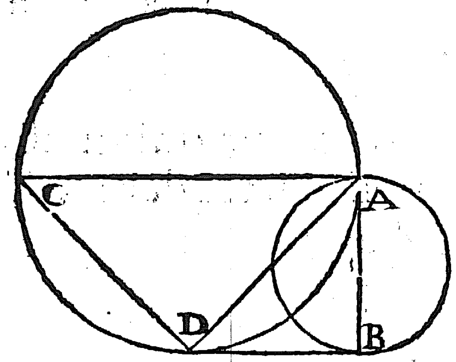
Prob. 2.

SIT dati circuli diameter AB. quem volumus triplare elongetur AB. in C. & sit AB. æqualis BC. & fiat circulus ex diametro A C. & sit AB. æqualis A D. quæ in circulo locetur per primam 4. Euclid. & ducatur DC. dico circulum ex DC. diametro circuli ex AB. tripli esse. cuius demonstratio ex 12. 13. lib. Eucl. pend.

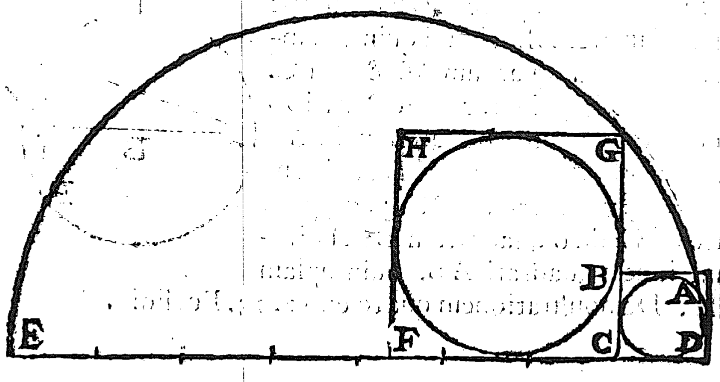


Si vero quintuplare voluerimus sit data diameter AB. circuli quintuplandi. Elongetur quantum AB. & sit BC. circumducatur ei circulus A D C. in quo pentagonum æquilaterum inscribatur per 9. 4. Eucl. & sit linea subtendens duobus lateribus DC. pentagoni latus AC. dico quadratum DC. DE. simul iuncta quadrati A B. quintuplam esse. Demonstrationem quære ex 12. 13. Euclidis.





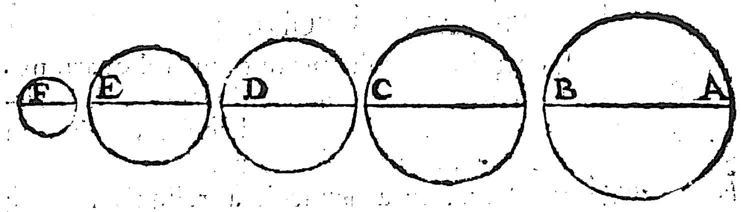
At is modus, vniuersalior, & commodior visus. Sit datus circulus A B. dimetiente descriptus, volo tergeminum reddere. Puncto igitur B. ipsius lineæ A B. ad rectos angulos adiungatur D B. paris quantitatis. Mox trahatur AD. dein ipsius lineæ DA. in puncto D. alia adiungatur DC. ad rectos angulos, & eiusdem quantitatis AB, & ducatur CA, & dimetiente CA. fiat circulus, qui AB. circuli tergeminus erit. Quoniam potentia lineæ AC, potentia linearum AD. DC. sibi vendicat, & AD. ipsius AB. BD, igitur AC. valet tres circulos, cuius inest A B. Quod si quintuplare, aut per alios impares numeros multiplicem reddere voluerimus: Addemus puncto C. lineam alteram ad pares angulos quantitatis AB. & erit quintupla ipsius AB.

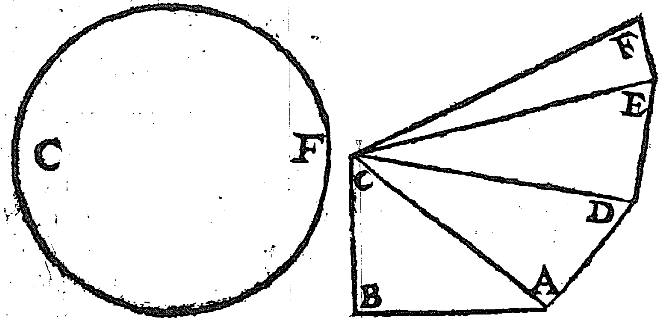


Possumus etiam si velimus alio modo idem exquirere.

Sta-

Statuatur circulus A B C D. septies multiplicandus cui circumducatur quadratum, & latus eius producemus, illudque in octo partes diuidemus, cuius principium D. finis E. mox DE. per medium diuidatur in F. positoq. circini pede in F. & alio DF. circumducatur quousq. semicirculum absoluat DE. & latus C. B. quadrati producatur vltra B. in continuum, rectumq. ad arcum DE, & vbi eum contingit, illic scribe literam G. & ex CG. fiat quadratum CGHE. in quo circulus inscribatur, qui continebit septies ipsum BACD. Quoniam CG. est media proportionalis inter EC. CD. igitur per. 13. 6. Euclid. vt EC. prima ad tertiam CD. ita GH. quadratum secundæ ad BD. quadratum tertiæ per 20. 6. Est autem E C. per constructionem septupla ipsius C D. igitur quadratum HC: septuplum ipsius quadrati BD. quod probandum assumpsimus.





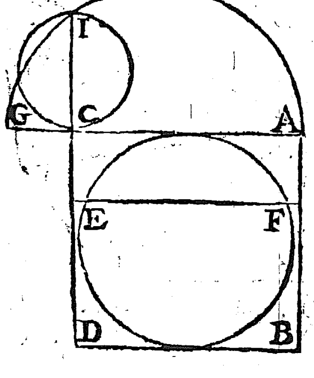
Sint positi quini circuli diuersæ capacitatis AB. C.D.E.F.

quo-

quorum quantitates volumus singulari circulo compræhendere, quod ita propemodum faciendum existimamus. Esto enim circuli diameter AB. constituatur ad rectos angulos ei BC. mox ducatur linea ab A. ad C. & hæc dimetiens potest binos circulos AB. C. Porrò puncto A. lineæ AC. recta linea erigatur ad rectos angulos, quæ sit AD. & à puncto D. trahatur linea D.C. & hæc dimetiens est capiens tres circulos AB. C. D. ipsi demum CD. recta linea ad rectos erigatur DE. quarti circuli dimetiens potens quatuor circulos. Postremo ei lineæ EC. ad rectos iterum excitetur quinti circuli EF. trahaturq. per FC. dimetiẽs, capiẽs iam cunctos circulos; & hoc modo omnes licet quotquot volueris compræhendere. Demonstratio habetur ex penultima 1. libri Euclidis.

Ex dato circulo datam partem subtrahere. Probl. 3.

SI dati circuli volumus tertiam, vel quartam partem extrahere, hoc modo facito. Esto circulus ABCD. circa eum describe quadratum ABCD. cuius abscinde partem tertiam, ac transuersa linea conuenit à reliquis supernè distinguere FE.

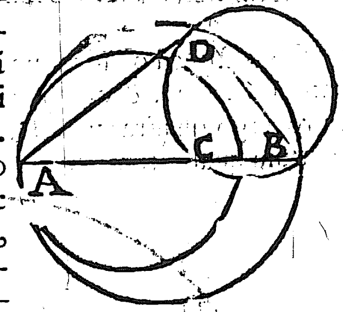


Procurrat igitur AC. in G. & fiat CG. æqualis CE. supra lineam AG. dimidium rotunditatis arcum excurrat, & linea DEC. eousque producenda erit, quo circumferentiam in I offendat. Linea CI. potest quantum paralellogrammum ACEE. sic de quinta & septima parte cuius demonstratio ex vltima secũdi depẽdet Eucl.

Datis

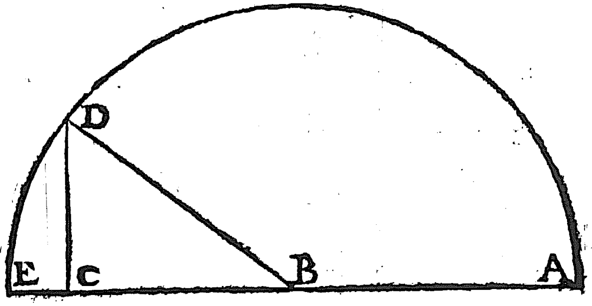
Datis duobus circulis inæqualibus à maiori minorem subducere, & circulum dare reliquo æqualem spatio. Probl. 4.

SVbducitur etiam circulus minor à maiori, & circulus etiã formari potest, qui vtriusque diferentiam capiat. Esto maior circulus ABD. volo ab eo circulum subducere, ac mox alium circulum formare, qui lunulam ADBC. inter vtrũque relictam capiat. Subducẽdus circulus AC. hæreat in fine diametri AB. in A. positoq. circini pede in A. altero ad C. vagum ad circumferentiam traducito, & vbi eam incidit, ibi locetur D. Mox ex B. ad D. transuersa ducatur linea DB. Dico lineam DB. esse eius circuli dimetientem capientem inter AB. AC. differentiam. Quoniam trianguli ADB. angulus D. ad circumferentiam rectus est; subtensa AB. potest, vt AD. DB. Si igitur ex AB. subducatur AD. circulus, remanet alter DB. differentiam capiens vtriusq.

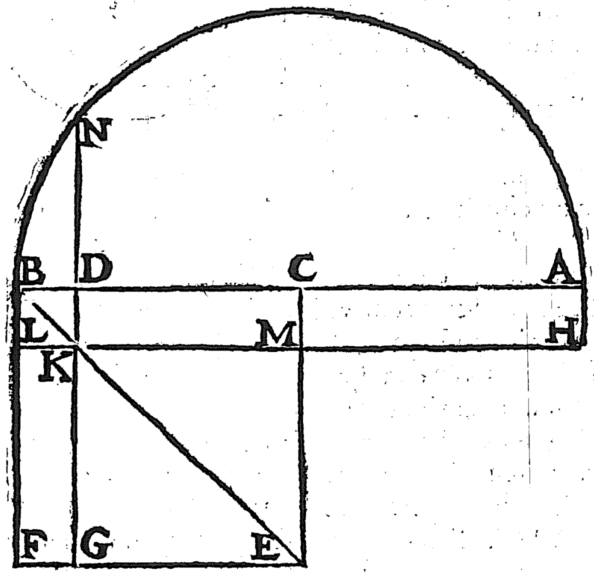


Possumus, & aliter demonstrare. Extendatur linea AB. diameter circuli AB, cui adiungatur linea BC. diameter circuli AC. positoq. B. centro internallo AB. facito semicirculum ADE. Tum supra C. erigo perpendicularem CD. quousq. tangatur circumferentia in puncto D. & connecto BD. Dico CD. esse quesiti circuli diametrum. Quoniam C.

angu-



angulus rectus est quadratum subtensæ BD. æquale est quadratis BC. CD. & quadratum BD. est æquale AB. quia ex centro, ergo quadratum CD. tanto minus est quadrato BD. quantum quadratum BC.



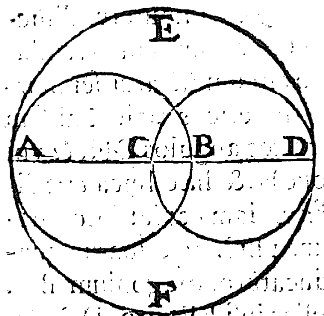
Quod si voles alio modo efficere hac ratione assequeris. Sit

Sit dimetiens maioris circuli CB. & ab ea amputetur dimetiens minoris circuli CD, & linea BC tantundem extendatur ad A, & puncto C facto centro circumducatur semicirculus ANB. & à puncto D, vbi minor dimetiens maiorē abscindit, erige super transuersam AB ad rectos angulos DN. & vbi DN periferiam secat ANB. istic pone N. & hæc linea erit dimetiens circuli inueniendi, qui differentiam capiat inter maiorem, & minorem circulum. Ex linea BC. describatur quadratum per 46. p. E. & sit CEBF. ducaturq; diagonium BE. & per D punctum descendat paralellas ipsi BF. sitq. DG. secabitq. diagonium in K & per K signum excitetur alter paralellus ad AB, & sit HMKL. & ex A ad H. ducatur alter paralellus ipsi CM. Quoniam supplementum CK. supplemento KF. per 43. 1. est æquale, addatur commune quadratum DL. erit CL æquale DF. sed quia AM est æquale MB paralellogrammo, quia AC. & BC. sunt æquales, ergo AM paralellogrammum ipsi DF paralellogrammo est æquale, addatur commune CK. erit totum AL æquale gnomoni MLF. sed quoniam MLF est excessus maioris quadrati CBEF. super minorem MKEG. & quadratum lineæ DN est æquale quadrangulo AK. & ex consequenti gnomoni MBF quæ est differentia vtriusque quadrati; ergo DN circulus est differentia duorum inæqualium circulorum, quod erat demonstrandum.

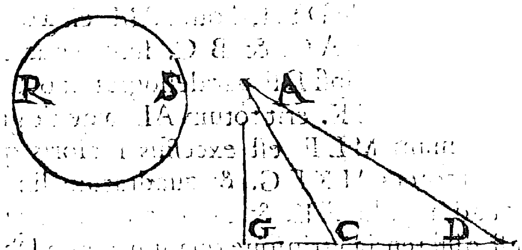
Datis tribus circulis, duos à maiori, qui duobus circulis laxior sit, subducere, & circulum dare reliquo spatio æqualem. Probl. 5.

SIT amplius qualem quis conficere velit circulus ADEF. sintq. pro arbitrio bini circuli A B. C D. quorum areæ

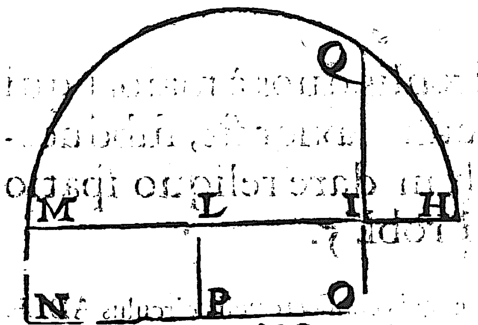
C totam



totam non contineant continentis amplitudinem, & ij vel in se ipsos flexi, vel mutuo intercisi, vt in exemplo; volo constringi circulũ, qui reliquum spatium contineat, scilicet interceptum vacuum. Ex tribus AD. DC. BA. fiat triangulum ACD. quod obtusum erit producaturq. alterutrius maioris circulatus, videlicet DC. eousque sit productionis meta, quousque à trianguli supercilio, quod prædictæ lineæ incumbit, linea

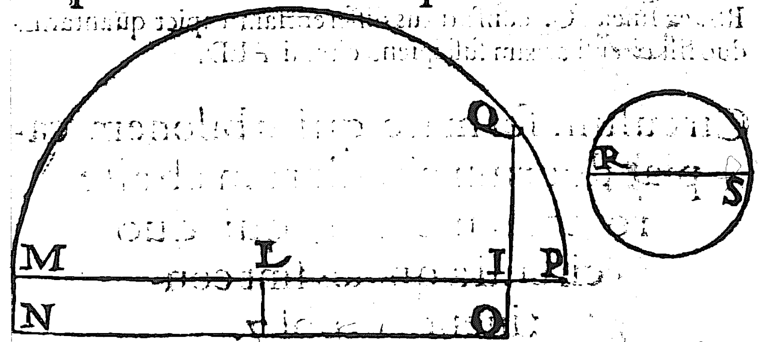


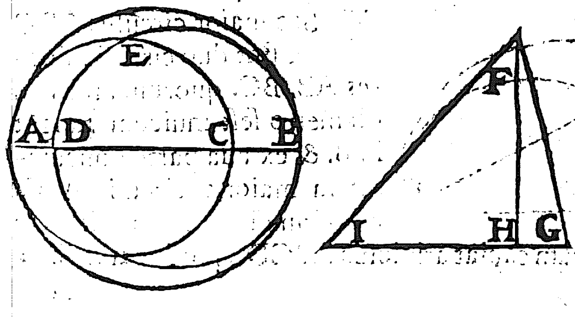
ad perpendiculum descendat, sitq. AG. His perfectis extruatur paralellográmum, cuius productus latus sit ex CD. geminata, & sit ML. LI. breuius ex CG. sitq. MN. IO. & producatur MI. donec æquetur IO. & sit IH. & extremæ lineæ lora terminentur per circuitionis arcum MQH. elongeturq. OI. inferaturque coeun-



coeunti lineæ cum arcu litera Q. sic ex linea IQ. fiat circulus RS. capiens iam dictam differentiam. Quoniam angulus ACD. est obtusus, quadratum lineæ AD maioris circuli superat quadrata DC, CA, minorum circulorum per rectangulum comprehensum ex DC. & CG. bis per 12. 2 Euclid. & ex his constitutum rectangulum MI, & diameter QI. capiet comprehensam aream, ex qua circulus RS. quæsitam differentiam continebit.

Datis tribus circulis duos à maiori, qui duobus circulis angustior sit, subducere, & circulum dare reliquo spatio deficienti æqualem. Probl. 6.

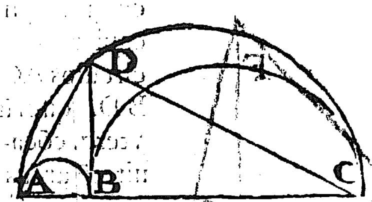




Esto AEB. circulus, qui capiet duos circulos AC BD. quorũ vterq. concauitate arcus capietis cõtigat, suisq. ar-

arcis continentis areã excellant, vestigandus est circulus, qui differentiam excellentis areæ excipiat. Fiat triangulum ex tribus lineis AB. AC. DB. per 22. 1. Euclid. & sit GFI. qui erit acutus, cadat ex apice F. trianguli in substratam basem GI. orthogonaliter linea FH. & vbi eam abscindit, illic fige literam H. Porrò ex geminata base GI. & linea GH. in se ductis, fiat paralellogrammum MO. & superior linea MI procurrat quousque sit æqualis IO. & sit P. Mox partire interuallum MP. per æqualia in D. & ex D centro describe semicirculum, elongeturq. linea IQ. quousq. attingat arcum MP. in Q. & IQ. dimetiens erit futuri circuli quæsitam differentiam capientis. Quoniam quadratum FI. minus est FG. GI. quadratis tantum, quantum rectangulum bis sumptum ex linea IG. GH. per 13. 2. Euclid. quod erit NI. & linea IQ. erit dimetiens continens aream NI. circulus igitur RS. ex linea IQ. constitutus differentiam capiet quantam duo illi circuli aream suscipient circuli AED.

Circulum formare, qui arbilonem capiat duorum circulorum ab altero contentorum, qui duo circuli æquales sint continenti. Probl. 7.



Esto maior circulus ADC & sint duo circuli minores AB. BC. quorum arcus in diametro sese inuicem tangãt in B. & ex alia parte concauitatem maioris circuli A. C. volo inuestigare dimetientem circuli, qui aream capiat arbilonis ABCD. producatur linea ex mutuo circulorum contactu B. donec rotundationis maioris circuli aream tetigerit BD. dico eam esse diametrum futuri circuli, qui arbilonis ABCD. aream continet. Hanc constructionem præsenti demonstratione suffulciemus. Quoniam linea AC. secta est in puncto B. quadratum, quod fit ex AC. æquale est quadratis, quæ fiunt ex AB. BC. & paralellogrammo, quod bis fit ex CB. BA. ex imperio 4. 2. Euclid. Sed paralellogrammum ex CB. BA. est æquale quadrato DB. circulus ergo ex DB. est æquale arbiloni ABCD. quod quadratum ex DB. æquale sit quadratis AB. BC. patet etiam ex 17. 6. Euclid. Vel quoniam circulus ex DC. æqualis est duobus circulis ex DB. BC. quia B. est angulus rectus, & circulus ex DA. circulis ex AB. BD. ergo circulus ex AC est æqualis duobus circulis AB. BC. & duobus circulis ex DB. qui in eo continentur, arbilon igitur ADCB. ex circulo DB. constat.

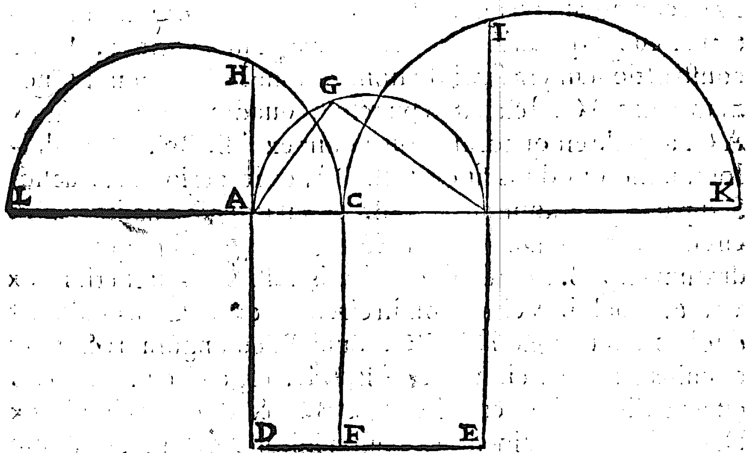
Corollarium.

Ex hoc prouenit dato arbilone posse illico dari circulum ei æquale, scilicet lineam erigendo ad duorum semicirculorum coniunctione ad circumferentiam.

Si diameter secetur vtcunque, circuli, qui fiunt ex tota, & singulis partibus continentur, æquales sunt ei, qui à tota fit circulo. Probl. 8.

Fiat quadratum ex linea AB. & extendatur AB vsque ad K. & sit æqualis AB. & supra CK fiat circulus CIK. & ex alia parte BA extendatur in L, & sit æqualis AB. & super

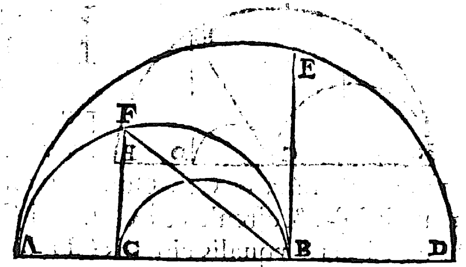
per



per CL. formetur circulus, & fit CHL. & supra AB fiat alter circulus AGB. & ex C extendatur parallelus ipsi AD. BE. & fit FCG. extendaturq. DA ad H. & EB ad I. ducanturq. ex G. GA. GB. Quoniam quadrangulum ex KB. BC. est æquale quadrato BI. & quadrangulum ex LA. AC. est æquale quadrato AH. coheant ipsæ BI. AH. in circumferentia AGB. in puncto G. quia in circumferentia ad rectum angulum: ergo quadratum ex AB. duobus quadratis AG. GB. æquale erit, & sic de circulis, vel aliter.

Quoniam per præcedentem diameter diuisa bifariam in C. quadratum ex AC. & CB. & rectangulum bis contentum ex BA. AC. est æquale quadrato AB. sed rectangulum bis contentum ex BA. AC. est æquale quadrato ex CG. sed quadratum ex BC. CG. & quadratum ex AC. CG. sunt æqualia quadratis ex AG. GB. & quadratam ex AG. GB. sunt æqualia quadrato ex AB. ergo ostendimus, quod intendebamus, & est secunda secundi Euclid.

Si diameter secetur vtrunq; circulus ex tota, & eius parte contentus æqualis erit circulo, qui ex partibus continetur, & eius quod ex prædicta parte fit circulus. Propos. 9.

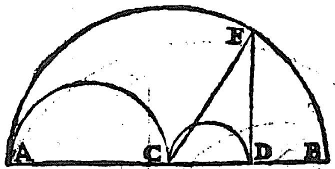


Sit diameter AB. secta vtcunq; in puncto C. dico circulum ex AB. BC. contentum æqualem esse circulo ex BC. CA. contento, & circulo CB.

Extendatur AB. in D. & fit BD. æqualis ipsi BC. & super ACBD. fiat circulus, & sit AED. & ex puncto B. eleuetur perpendicularis vsque ad E. Idem fiat ex altera parte. Supra AC. & CB. duo circuli, & ascendat ex C perpendicularis CF vsque ad semicirculum AFG, extendaturq. FB.

Quoniam quadrangulum, quod fit ex AB. BD. æquale est quadrato, quod fit ex BE. & quadrangulum, quod fit ex BA. AC. æquale quadrato ex CF. sed quadratum ex FG. æquale est quadratis FC, CB. quia C angulus est rectus ergo circulus ex AB. BC. quod est BF æquale est circulis ex CB. & qui fit ex BC. CA. & est 31. 1. Euclid.

Si diameter secta fuerit in partes æquales, & inæquales circulus ex inæqualibus partibus contentus vna cum eo, qui fit ex linea, quæ inter sectiones interijcitur æqualis est circulo, qui fit à dimidia. Prop. 10.

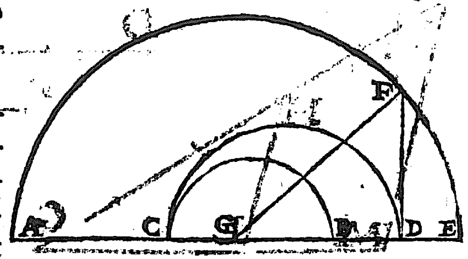


Describatur circulus ex Diametro CA. alter ex AB. alter vero ex CD. ex D. puncto erigatur perpendicularis vsque ad circumferentiam in E. & protrahatur CE. Quoniam circulus ex AD. DB. est æqualis DE. & circulus ex CD. ipsi CD. ergo circulus, qui fit ex CE. erit æqualis circulis CD. DE. sed CE. est æqualis CA. quia ex centro ad circumferentiam, ergo circulus ex duabus inæqualibus partibus compositus AD. DB. qui est DE. & circulus CD. vtrique æqualis est circulus ex dimidia CA. compositus, & est 5. 2. Euclid.

Si diameter bifariam secetur, eiq. in rectum adijciatur quædam recta linea, circulus ex tota diametro cum adiecta tanquam ex vno diametro, vna cum circulo dimidiæ æquales sunt circulo ex dimidia, & adiecta tanquam ex vna diametro descripto. Prop. 11.

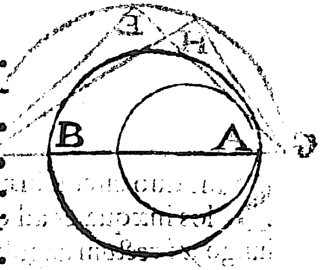
Sit diameter AB. secetur bifariam in C. & ei in longum adijciatur linea BD. dico circulus descriptus ex AD. DB. vna

DB. vna cum circulo CB. æquales esse circulo, qui fit ex CD.



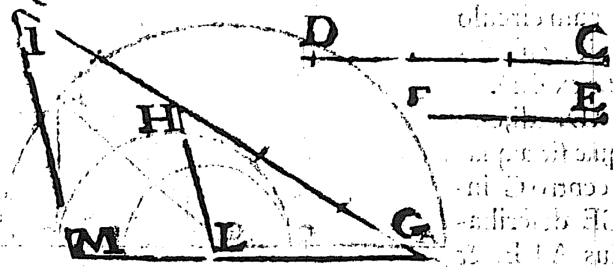
Lineæ AD. adijciatur DE, quæ sit æqualis DB, & centro G interuallo GE describatur circulus AFE. & ex puncto D linea ad rectum erigatur vsque donec circuli circumferentiam contingat, quæ sit DF. & erit quadratum æ quadranguli AD. DE. & puncto D. linea DC secetur CB æqualis, & erit GD. & connectantur puncta GF. linea GD est æqualis CB. ex constructione. Quoniam lineæ AC. est æqualis lineæ CB. & CB. ipsi GD. adijciatur ipsi AC. communis CG. & linea DE. est æqualis BD. ex constructione, ergo CD. ipsi GE. & angulus ad D. rectus est, valet ergo quadratum GF. quadrata GD. DF. ergo quadratum GF. valet quadratum CD. quod demonstrandum proposueramus & est 6. 2. Euclid.

A dato circulo alium in datam proportionem abscindere. Prop. 12.



ESTO datus circulus AB. volo alterum construere, vt ad eum datam proportionem habeat, sitq. data proportio CD. ad EF. scilicet sesquialtera. Iungantur angulo binæ lineæ, quarum vna GH. fit æqualis lineæ CD. protendanturq. quousque HI fit æqualis EF. Mox alteri lineæ æquetur diameter

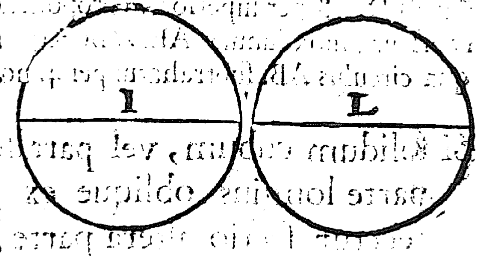
D



meter AB. quæ sit GL. iungaturq. HL. & GL. extendatur, & à puncto I. lineæ HL. parallelus excitetur IM. dico LM. diametrum esse quæsiti circuli AO. subsesquialteri, & erit quarta linea proportionalis inuenta. Quoniam proportio GH. ad HI. est sicut GL. ad LM. ex 2. 6. Eucli. & GH. ad HI. est sesquialtera, ergo GL. diameter ad AO. diametrum sesquialtera est.

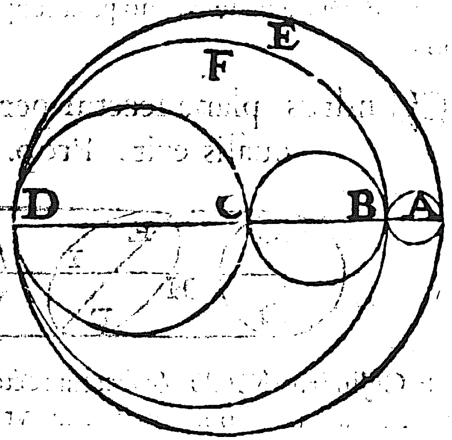
Ex duobus inæqualibus circulis duos æquales facere. Prop. 13.

Sint duo circuli inæquales AB. CD. volo hos duos circulos inæquales ad duos æquales reducere AB. DC. coniungo ad rectum angulum diametros, & sint GHF. & connecto GF. tunc super FG. facio semicirculum, qui per H rectum angulum trāsibit, mox diuido circumferentiā in E. bifariam, & pro-



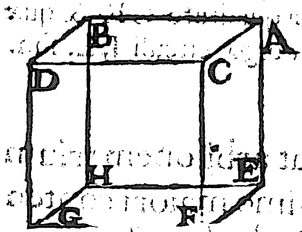
produco GE. EF. dico duos circulos duarum dimetientium GE, EF. esse æquales duobus dimetientibus GH, HF. & proinde circulis I, L. Quoniam angulus H est rectus, quia ad circumferentiam, ergo quadrata GH. HF. sunt æqualia quadrato GF. & quadratis GE, EF. etiam æqualia quadrato GF. & quæ æqualia vni tertio æqualia inter se, ergo circuli I, L. sunt æquales AB. CD.

Circulum formare, qui capiat arbilonem trium minorum circulorum, ab imo maiori contentorum, qui tres circuli æquales sint diametro continentis. Prop. 14.



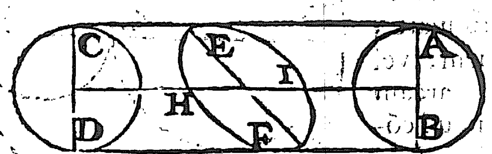
ESTO circulus AED. cuius dimetiens AD. tribus circulis diametris intercidatur DC CB, BA. postulamus circulum formare, qui arbilonem, vel interceptam aream à maioris circuli cōcauitate, & minorum conuexitate contineat. Ex BD Diametro circulus fiat BFD. & per ſuperiorem propoſitionem 7. arbilon BFDC capiatur, mox lunulæ AEDFBC quantitas cognoſcatur, à qua circulus AB. ſubtrahatur per 4. noſtram,& ſic de cæteris.

Si ſolidum cubum, vel parallelipedum altera parte longius oblique ex oppoſitis lateribus ſecetur, ſectio altera parte longius erit. Propoſ. 15.



ESto ſolidus cubus ABCDEFGH & ſecetur à plano BDEF. oblique ex oppoſitis cubi lateribus BD. EF. dico BDEF. eſſe altera parte longius. Quia DG, GF, æqualis eſt. DF autem ſubiacens linea eſt æqualis duobus quadratis DG. GF. ergo longior BD. quæ ipſi DG æqualis eſt, idem dicendum de altera parte BH. HE, quia BE, maior eſt BH. HE. Igitur BDEF. altera parte longior eſt. Idem quoque dicendum de ſolido parallelipedo altera parte longiori.

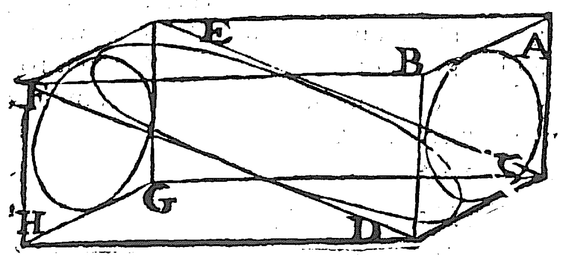
Si Cylindrus plana ſecetur per obliquum ſectio oualis erit. Prop. 16.



SIt Cylindrus ABCD. & ſecetur rectè ABG. ſectio AGB. circulus erit, ſi oblique ſecetur, vt in IEHF. ſectio ſphærois erit ex ea quæ Serenus probauit in ſuis Cylindricis.

Si

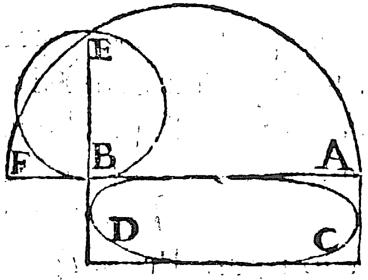
Si intra ſolidum paralleli pedum altera parte longius cylindrus inſcribatut tangens ſui circuli baſis latera eius quadrati, & parallelipedum ſolidum obliquè ſecetur ea proportio erit circuli quadrato, quam ſphærois figura ad ſuum altera parte longius. Prop. 17.



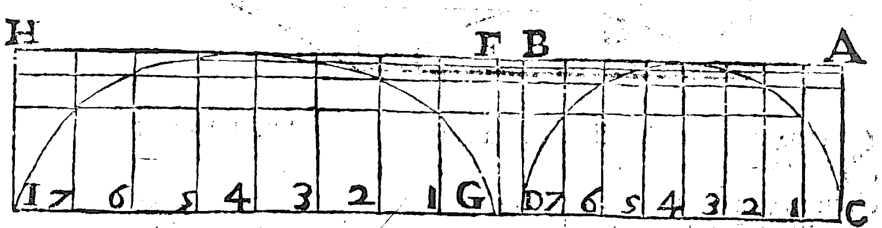
SIt parallelipedũ ſolidũ altera parte longius ABCDEFGH & ſint cylindri in eo deſcripti baſes ABCD. EFGH. circuli in ea deſcripti ABCD. EFGH. & planum obliquè ſecans illud ſit CDEF. & ſphærois in eo deſcripta CDEF. dico ſphæroidem intra ſe deſcriptam eandem habere proportionem ad ſuam figuram altera parte longiorem, quàm circulus ABCD. ad ſuum quadratum ABCD. cuius demonſtrationem omittimus: nam ex his, quæ Euclides in ſuorum elementorum, 12. & Archimedes in 31. præpoſitione deſcripſerunt, demonſtratur.

Data ſphæroide circulum eiuſdem areæ deſcribere. Prop. 18.

ESto data ſphærois ABCD. iubeo circulum eiuſdem ſpatij. Circa datam ſphæroidem quadrangulũ circumſcribatur



batur ABCD. & latus AD prolongetur vsque ad F. vt BF. sit æqualis BD. Et circa AF. semicirculus describatur, elongeturq. BD. donec circumferentiam feriat, & sit in puncto E. dico circulum conscriptum circa BE. diametrum continere aream sphæroidis ABCD. Hæc clara sunt ex demonstratione Archimedis libro de sphæroidibus, & conoidibus parte 5.6.7. sphæroidem idem describendi modum mechanicè, & gratia commoditatis proponam ex Alberto Durerio.

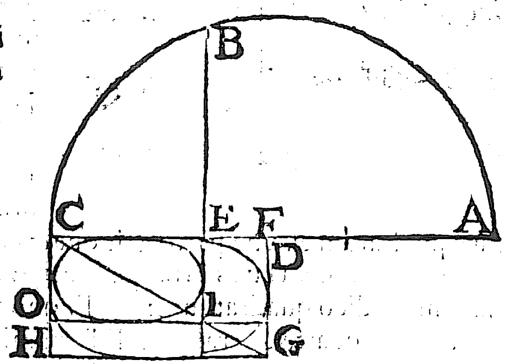


Describe quadrangulum in duplo triplo, aut sesquialtero, & sit in circulo supra AB. infernè CD. cuius latus CD. diuide in puncto E. per medium, ac posito vno circini pede in puncto E. interuallo EC. ducatur per superiorem partem vsque ad D. continget hic arcus lineam AB. deinde partire lineam CD. in octo æquales partes, & ex singulis diuisionibus protrahe sursum parallelas in nuper descriptum arcum. Deinde fac iuxta quadrangulum ABCD. adhuc alium quadrangulum æqualis altitudinis, sed longitudinis quantæ volueris cuius superior linea FH. inferna vero GI. & seca id quoque in octo partes æquales, vt prius, postea producito ex singulis sectionibus sursum lineas parallelas, deinde ex singulis inter sectio-

nibus prioris arcus, quæ per octo lineas parallelas factæ sunt, parallelas transuersales per omnes perpendiculares longioris quadranguli, & per sectiones illas longiorem parallelorum arcum produc lineam æqualem de puncto in punctum incipiendo ab angulo G. & finiendo in I, vt vides.

Datam sphæroidem duplare, vel quadruplare. Probl. 19.

Sit duplandum quadrangulũ ECIO. quod idem est, ad duplandam sphærois, quod intra illud circumscripta est, & quadrangulum erit simile, similiterq. positũ, quemadmodum, & sphærois. Producatur

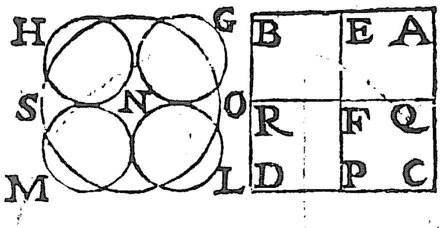


latus quadranguli EC. vsque ad A. & sit AE. dupla ipsius AC. ac ipsius AC. medio D. posito circini pede, DA interuallo, describatur circulus ABG. producaturq. IE. vsque ad circumferentiam B. & erit EB. latus vnum rectanguli describendi. Rescindatur igitur ex CA, linea CF, æquali EB, & ducatur diameter CI. deinde per F. ducatur parallela ipsi EI. quousque occurrat diametro CI in G. & per G altera parallela ipsi FC producatur, quæ sit GH compleaturq. parallelogrammum FH. erit igitur hoc parallelogrammum ipsi CI. simile, similiterq. positum duplum. Quoniam AE, EB, EC. sunt tres lineæ proportionales ex 13. 6. Euclid. erit vt AE. prima ad EC. tertiam, ita parallelogrammum IH. ex EF. se-

cunda

cunda (nam CF sumpta est æqualis EB.) ad parallelogrammum EO: supra tertiam EC, quod simile, similiterq. descriptum.

Si circuli diameter bifariam secetur, & ex vna parte circulus fiat hit erit totius pars quarta. Prop. 20.

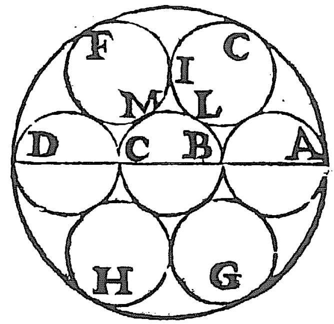


RAtiones circulorum sequuntur rationes quadratorum eis circumscriptorum, vel inscriptorum, & quemadmodum, si quadrati diameter diuidatur quadratum ex vna parte, erit quarta parte totius, ita, & circulus; Exemplum latus AB. quadrati AD. diuidatur bifariam in E. dico quadratum ex AE. quod est AF. est AD quadrati pars quarta. Trahatur EP parallela, ipsi AC. & QR. ipsi AB, & erunt quatuor parallelogramma rectangula, & si aliter probari posset rationem recitabo apud Platonem in Memnone. Socrates enim puerum hoc modo docet: Sit bipedalis linea AB. dico suum quadratum esse quatuor pedum AQ erit vnius pedis, erunt dico quadrata QF. FR. sit & altera pars CD duos pedes longa vnum alta C. erunt enim duo quadrata CF. FD. tota igitur quatuor erit pedum. Sit ergo circulus OILM. cuius diameter ONS. diuidatur bifariam in N. ex quantitate ON. quatuor circuli inscribantur, dico quatuor hos circulos toti æquales esse. Ratio ex superiori pendet: nam & circuli se habent ad quadrata, vt eorum diametri.

Cir-

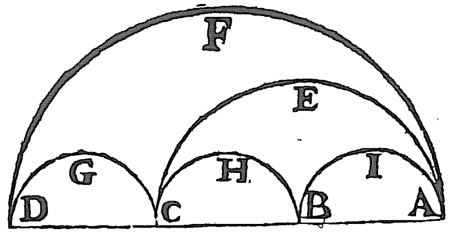
Circulorum vacua metiri, quando maior minores contineat. Prop. 21.

SIT magnus circulus AEFDHG, cuius diameter AD, diuidatur in tres partes, & in eo fiat tres circuli AB, BC, CD, & supra duo alij, & duo infra inscribantur; nam sex circuli æquales intra vnum inscribuntur ex 15. 4. Euclid. & ex præcedenti totus circulus nouem circulos cōtinebit: nam diameter trifariam diuisa est, sunt intus septem contenti, ergo omnia vacua duo erunt circuli cuius 3. pars erit scalprum EIF. cum suo residuo ILM.



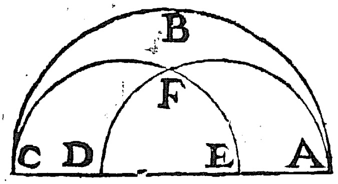
Arbilones per circulares figuras metiri. Prop. 22.

SIt arbilon primū AFDGCHBIA. inuestigādum quot circulos capiet, qualis AB. Ex præcedēti semicirculus AFD nouem capiet semicirculos qualis AIB si substuleris AIB, BHC, CGD, erit arbilon reliquum sex

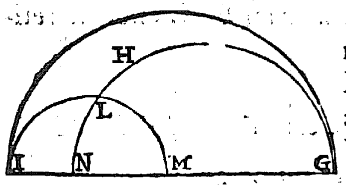


E semi-

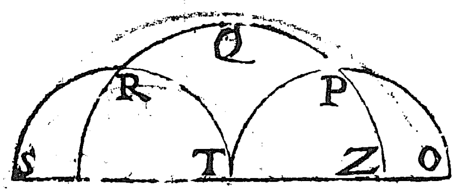
ſemicirculorum. Si quærimus arbilonem AFCHBI. erit ſemicirculus AEC quatuor ſemicirculorum qualis AIB, demptis duobus AIB, BHC, erit arbilon duorum ſemicirculorum. Si quærimus arbilonem AFDGCEA, erit ex iam dictis quatuor ſemicirculorum.



At ſi ſemicirculus maior ABC capiens duos ſemicirculos AED, EFC, vt docuimus in prima noſtri, dico arbilonem ABCFA eſſe æqualem duplato EFD, quod ex figura patet: nam quod replicatur in figura EFD deficit arbilon in ſua ABCF. Vel quarta pars dupli BEA. eſt æqualis ſemicirculo AFD. pars extera EFD eſt æqualis interiori corniculari angulo FBA.



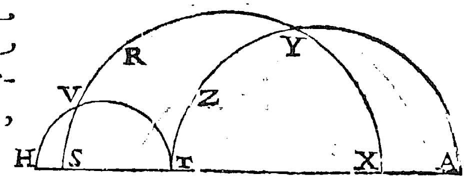
Idem eueniet in figura GHI: nam duo ſemicirculi GHLN, & MLI. per ſecundam noſtri capiũt aream continentis circuli GHI. Vnde duplatum MLN. eſt æquale arbiloni GHLIHG.



Poteſt etiam euenire, vt arbilon medium PQRT eſt æquale duobus extrinſecis circuli partibus OPZRS. ex ſuperiori ratione.

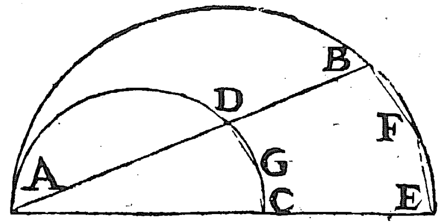
Idem

Idem eueniet in hac poſtrema, vt arbilon YZTVRY. ſit æquale duobus circuli extrinſecis partibus AYX, SVH.



Si duo vel quamplures circuli in fine diametri ſe tangunt à contactus autem puncto ducatur linea eos ſecans arcus ſecti inter ſe ſimiles erunt. Prop. 23.

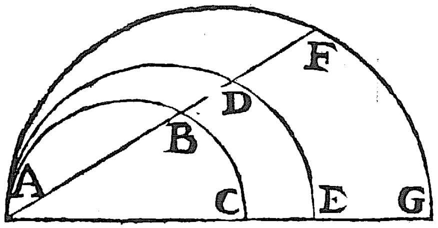
Sint duo circuli ABE, ADC ſe mutuo tangentes in fine diametri A, & ducatur recta linea ADB, ſecans arcus ADC, in D, & ABE, in B, qui quidem arcus bifariam ſecentur, quia anguli in circulo oppoſiti per 22. 3. duo æquales rectis duobus in 2. ergo angulus BGC, & BFE æquales ſunt cum eodem BAC angulo iuncto.



Data circuli portione eam multiplicare, Prop. 24.

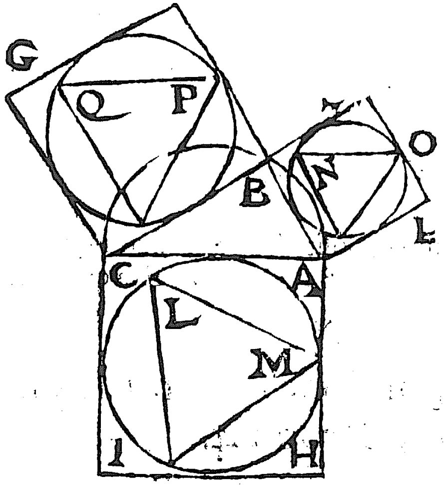
Sit data circuli portio AB, quam volo duplare & ſit eius circulus ABC, & ſit ſemicirculus ADE du-

E 2 plus



plus dati. Per primam nostri, linea A B trahatur longius in D, & si voluerimus quadruplare sit circulus A F G quadruplus & linea A D in F extẽdatur, dico portionem DA ipsius BA duplam, & FA ipsius BA quadruplam cuius ratio pendet ex anteriori.

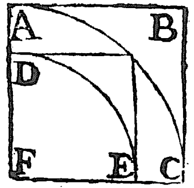
Ex duabus portionibus similibus vnã similem facere, vel subtrahere. Prop. 25.



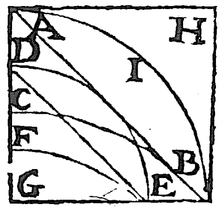
Sint duę inæquales circuli portiones PQ. ON. sed similes, & sit vnaqueque tertia circuli pars per 25. 3. Eucl. & sint P Q G, ODN; circa quos dsscribantur quadrata B G, E B, vel eorum diametri, & iungantur ad rectum angulum ABC,& secundum AC describatur quadratum, & in eo circulus MLI, & sit ML latus æquilateri trianguli. Portio ML erit æqualis iam dictis dua-

duabus portionibus per ea quæ in 3. Euclid. probantur. Vel si ex M L voluerimus portionem P Q subtrahere, è recto quadrato AC, ac supra AC semicirculo descripto, ponatur latus quadrati B C, & eius latus B A latus quadrati portionem similem continentis. Et sic possumus ex pluribus portionibus vnam facere, & omnia illa, quæ de integro circulo retulimus.

Datum semicuruilineum triangulum duplare, subducere, vel è duobus similibus vnum facere. Prop. 26.



Sit semicuruilineum triangulum D G E, quod volo duplare, & sit circuli quarta pars FDE, fiat etiam circuli dupli pars, & sit A G C, circa eam quartam etiam quadrati partem circumscribo ABCF, dico triangulum semicuruilineum A B C G. duplum esse D G E, Quia quadratum A B C F duplum est D G F E inscripta portio proportionalis erit. Et sic subtrahere, & ex multis vnam facere poterimus ex supradictis.



Eodem modo triangulum D E G duplare poterimus, quod est æquale iam dicto: nam quadrati dimidium B H A est æquale B A G, si dematur portio B I A, æqualis BCG. remanet triangulum B A G. æquale BHA, iam dicto.

dicto. Vnde si voluerimus prædictum EDF semicuruilineum triangulum duplare, duplato quadrante HABG, protractoq. diametro BA. circulus duplus BIA, qui erit BC describatur BC, & erit triangulum ABC duplum trianguli EDF.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Secundus.

AXIOMATA.

I.

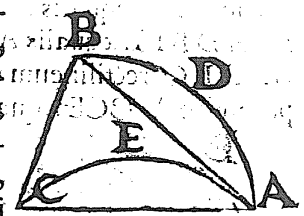
SI eidem addideris, quod prius dempseris, quantitas æqualis erit.

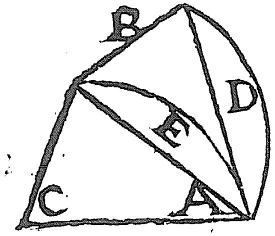
II.

Si nota quantitas à nota subtrahatur, quæ remanet nota erit.

Triangulum semicuruilineum ex æqualibus, ijsdemq. circumferentijs compositum quadrare. Prop. I.

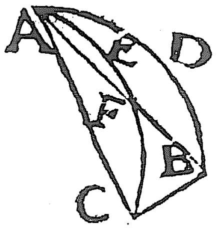
ESto triangulum quodpiam semicuruilineum ADBCE, Aequalibus nimirum ijsdemq. circumferentijs ADB, AEC, & recta BC basi constituta volo illud quadrare. Ducatur linea AB, & AC, aio aream trianguli semicuruilinei ADBCE esse æqualem triangulo rectilineo ABC. Quoniam circumferentia ADB est æqualis portioni AEC, ablata ADB, repositaq. in AEC æquale remanet triangulum rectilineum ABC semicuruilineo per primum axioma nostrum.



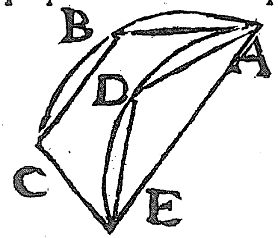


Vel fiat triangulum æquale rectilineum ABC, & sit AFC ex 22.1. Euclid. erit semicuruilineum triangulum ADBCE, æquale triangulo semicuruilineo A E C F dempta communi portione A E C remanet rectilineum A F C triangulo semicuruilineo æquale ADBCE.

Alter Casus.



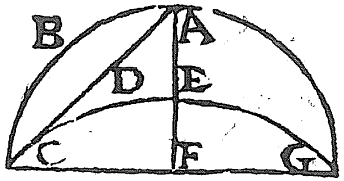
AT si triangulum ADBCE angustius erit, & portionis lineæ neutiquam intactas circumferentias relinquent, sed per medium transibunt, eadem operatione idem assequi poterimus. Sed quo res dilucidior euadat, rem exemplo complectemur. Esto triangulum ADBCE, & circumferentia ADB æqualis sit AFC, trahanturq. rectæ lineæ AB, AC, & secet AB basis ADB circumferentiam AEC, aio rectilineum ABC æqualem semicuruilineo ADBCE. Quoniam portio ADB, æqualis est AEC dempta communi AEF, remanet ADBFE æqualis AFC, apponatur vtrique areola FBC, erit ABC rectilineum triangulum semicuruilineo triangulo proposito ADBCE æquale.



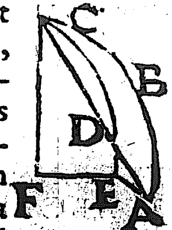
Vel ad eadem præstanda possumus easdem circumferentias in plures partes diuidere, nempe binas, ternas, quaternas, vt ABC circumferentiam in AB, BC, & ADE in AD, DE. Vnde exclusæ partes AB, BC, inclusis AD, DE erit area rectilinea ABCEDA æqualis semicuruilineo ABCEDA.

Trian-

Triangulum semicuruilineum ex varijs circumferentijs compositum quarum altera alterius dupla sit quadrare. Prop. 2.



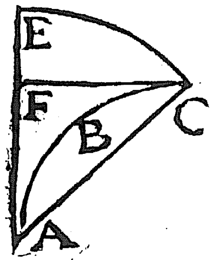
ESto triangulum semicuruilineum ABCDE cuius circumferentia EDC sit circuli dupli ipsius ABC. Sed EDC sit octaua pars circumferentiæ sui circuli GEDC, circuli vero ABC quarta. Aio triangulum semicuruilineum ABCDE rectilineo inuestigari posse parem. Rem ita moliemur. Completa circumferentia CE, fit CEG, & coniungatur AC, mox portionem CEG diuidatur per medium, & sit diuisionis linea EF, dico triangulum AFC semicuruilineo triangulo parem esse. Quoniam tota portio ABC æqualis est dimidiæ ECF, id propterea dempta ABC portione reposita EFC semicuruilineum ABCE, abijt in triangulum rectilineum ACF.



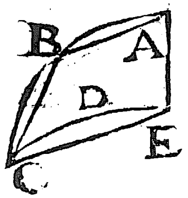
At si circulares lineæ magis cohærebunt, vt circumferentiarum bases introrsum se secent, eadem erit operatio, & demonstratio, vt in prima propositione. Productis lineis portionis AC, & semiportionis EFC triangulum rectilineum AEFC semicuruilineo par erit. Quoniam spatia ipsarum portionum ABC, EFC æqualia sunt, ablata interiacente portione DC, quod reliquum est ABCD ipsi EDCF æquale erit, addita vtrique areola AED, erit totum triangulum rectilineum AEFC toti semicuruilineo, ABCDE æquale, nam quanta pars ex

F dem-

demptione abijt, tota ex repositione substituta est.



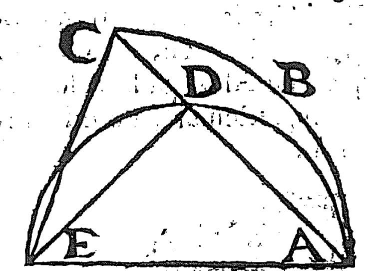
Vel potest transpositis lineis alio modo triangulum semicuruilineum constitui sit circumferentia dupli C D E retro C B A ante, tunc ex puncto C. super basim A E cadat perpendicularis C F, & connectatur C A, & sic triangulum semicuruilineum A B C D E rectilineo F C A parem iri. Ratio in superiori.



At si vt diximus ex varijs, & inæqualibus circumferentijs orbiculata triangula composita erunt, tunc mente concipiendum, si circulus duplus alteri sit, subdupli duæ circumferentiæ partes, vni dupli respondent, si quadrupli quatuor, & sic deinceps. Esto verbi gratia circuli dupli circumferentia E D C, & sit octaua suæ circumferentiæ pars respondet duobus octauis subdupli circuli A B C. Diuidatur ambiens linea ABC bifariam in B, & trahatur A B, B C, E C, & erunt duæ AB, BC portiones, vni EC æquales, & sic vna E D C, duas illas A B, B C absumet. Vnde si triangulum semicuruilineum duabus octauis circumferentiæ partibus decrescimus, AB, BC augemus vna EDC, & sic par pari referemus.

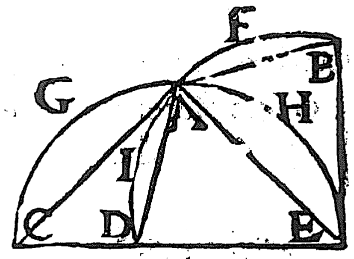
Alter Casus.

POtest & aliter euenire; sit triangulum semicuruilineum A B C E D, & sit A B C quarta dupli circuli, & A D E semicirculus subdupli; docebimus quomodo possis rectilineũ triangulum æquale semicuruilineo facere. Trahantur ex puncto per medium circuli A D E vsque ad C, & sit linea ADC, & linea DE. Erit triangulum semicuruilineum A B C E D æquale

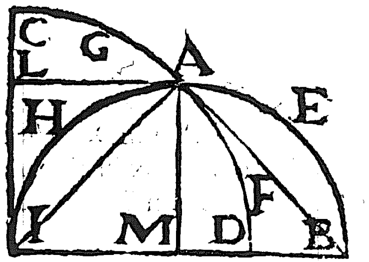


æquale rectilineo DCE. Quoniam portio A B C est dupla ipsius AD per 19. primi nostri, & huic nempe portioni AD æqualis DE. dematur dimidia portio ABCD, addatur DE compar., remaneatq. communis areola D C E F, vtrique sic enim rectilineum triangulum DCE æquale semicuruilineo ABCED, & sic excessus vnius alterius defectu rependetur. Sic & in alijs notis circumferentijs quadruplis quintuplis eodem Methodo vti poteris.

Semicuruilinea triangula ad verticem constituta ex eisdem, & æqualibus circumferentijs, vel ex æqualibus nota quadrare. Prop. 3.

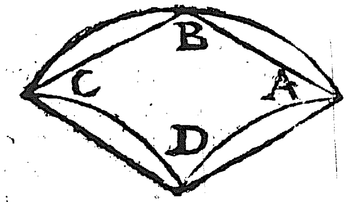


SI duo semicirculosa triangula ad verticem constituta ex eisdem, & æqualibus circumferentijs fuerint ductis à vertice ad bases rectis lineis, erunt rectangula circulosis ęqualia. Si primam huius libri leges non secus esse inuenies, quã diximus. Si acciderit, vt circumferentiæ eædem ad verticem sint inæquales, sed in id conueniant oportet, vt dextra interior sinistræ exteriori æqualis sit. Sint inæqualia triangula se inuicem decussantia BAE, ACD, segmenta sint æqu alia vt BFA, AID, & EHA, AGC, tunc protractis rectis BA, AD, AE, AE, AC, triangula rectilinea BAE, ADC, erunt circuloſis æqualia BFAHE, AGCDIA. Quoniam ſegmentum BFA æquale eſt AID. Si BFA ſeorſum expellimus,& AID ſua vice complectemur, ſic etiam reijcimus AGC reponimus EHA.



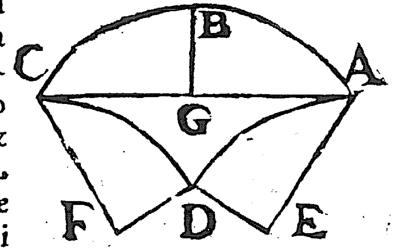
At ſi fuerint duo ſemicuruilinea triangula BE-AFD, & AGCIH conſtituta ad verticem A ex inæqualibus circũferentijs notis quarum DAC ſit circulus duplus ipſius BAI. Trahantur duæ lineæ perpendiculares ex A ad CI. & ſit AL, & AM ad BI. & binæ aliæ rectæ BA, AI, dico rectilinea triangula ALI, ABM, ſimul iuncta æqualia eſſe. Semicuruilineis BEAFD,CGAHI. Quoniam periferia DAC eſt circuli dupli quarta, & BAI ſubduplus ſemicirculus, duæ ſemiportiones AFDM, AGCL, abſument duas portiones BEA, AHI. demptis igitur BEA, AGCL, repoſitiſq. AHI. AEBM, rectilinea triangula BAM, LAI, æquiualebunt ſemicuruilineis iam dictis.

Curuilinea triangula ex eiſdem & æqualibus circumferentijs, & ex varijs notis quadrare. Prop. 4.

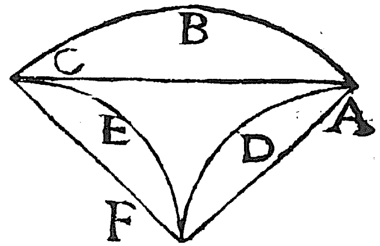


ESto curuilineum triãgulum ex tribus circumferentijs ABC, CD, DA, eiuſdem curuis, ſed ABC, dupla AD,DC conſtitutum quod quadrare intendimus. Dico protractis

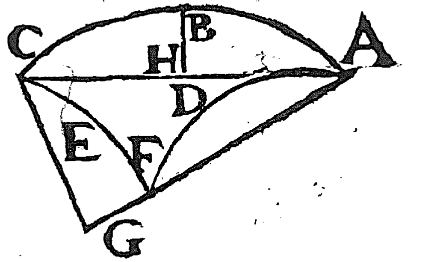
ctis æqualibus ſubtenſis AB, BC, CD, DA quadrilaterum, rectilineum ABCD,eſſe æquale curuilineo ABCD. Quoniam demendo portiones AB, BC, addendóq. AD, DC, quæ ſimul æqualia ſunt voti compos fies, vel aliud dicimus.



Poterimus alio modo id aſſequi. Protrahatur linea AC, & binas AE, ED, & lineas CF, FD, vt ſemiportio AED ſit æqualis ABG, & DCF, & ipſi BGC, nam duæ portiones dimidiatæ ADE, CDF æquiualent vni integræ ABC. Vna hac dempta, his additis quod diximus eueniet.

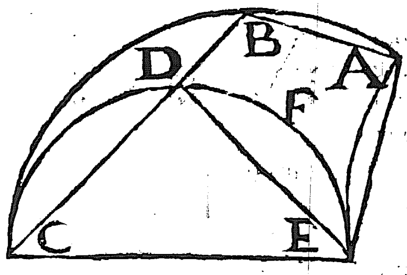


Eodem modo curuilinea triangula ex inæqualibus circumferentijs; ſed altera alterius exempli cauſa ſit dupla. Sit curuilineum triangulum ABCEFD ex inæqualibus circumferentijs, ſed ABC dupla ſit ADF, & FEC ſubtenſis lineis AC, AF, FC erit quadratum nempe binæ portiones ADF, EFC æquipollent ſimplici ABC, vnde illa dempta, his additis triangulum rectilineum FAC æquipollet curuilineo propoſito.



Poteſt contingere, vt triangulum conſtituatur ex varijs circumferentijs, & inæqualibus, vt FEC ſit dimidia ipſius ABC, & ipſa ABC dupla ipſius ADF, ſic facta ſemiportiotione CFG, æquali BHC, & ſubtenſis A F portio A D F erit æqualis ABH. Vnde hac dempta, illis ſubditis triangulum rectilineum ACG erit æquale curuilineo ABCEFD.

Alter Caſus.

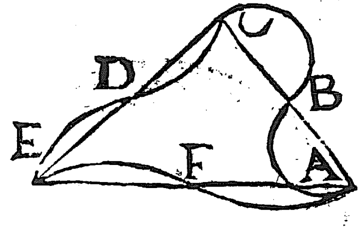


ESto curuilineũ triangulum ABCDFE propoſitum quadrãdum, & circumferentia circuli ABC ſit dupla EFD GC, diuidatur circumferentia EDC bifariam in D, & trahatur CDB erit ceratoide triãgulum BHCGD æquale portioni DGC per 19. primi noſtri. Vnde dempto BHGCD reponatur eius vice portio EFD æqualis DGC, & quia circumferentia AE eſt æqualis, & eadem ipſius AB, ablato AB repoſita AE, trapezuim rectilineum ABDE erit æquale propoſito curuilineo triangulo ABHCGDEF.

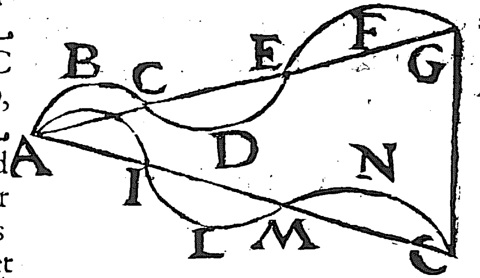
Cyſſoide triangulum ex æqualibus, & inæqualibus circumferentijs quadrare. Prop. 5.

ESto Cyſſoide triangulum AFC ex tribus inæqualibus circumferentijs conſtitutum ABC, CDE, EFA curuilineum, & latera diuiſa, & æqualibus circumferentijs con-

ſtituta, vt AB, ſit æqualis BC, & CD, ipſi DE, & EF ipſi FA, vnde tractis lineis rectis AC, CE, EA, & demptis tribus circum ferentijs BC, DE, FA, & alijs tribus repoſitis AB, CD, EF, rectilineum triangulum ACE æquale eſt cyſſoidi ABCDEF.

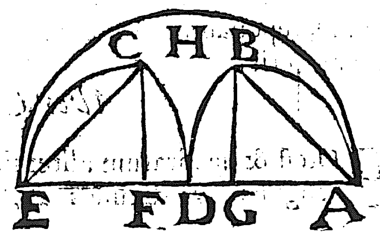


Sit quoque ſemicyſſoide triangulum quadrandum ABCDEFGILMNO, ex varijs circulorum circumferentijs, ſed tamen binis ſemper oppoſitis æqualibus conſtitutum videlicet GFE maioris circuli circumferentia, quam EDC, & EDC maior CBA, ſed tamen GFE æqualis ONM, & EDC, ILM, & CBA, AHI, ſi à puncto A ad baſim GO lineæ rectæ trahantur, totum aſſequeris, ratio pendet ex ſuperiori.

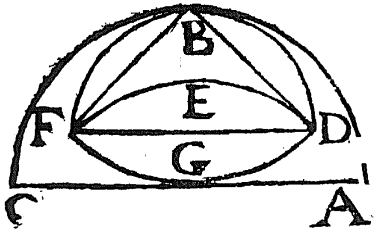


Arbilonem quadrare. Prop. 6.

ESto arbilon AH ECDB quadrandum, quia portio AH eſt dupla AB, & AB eſt æqualis ſemiportionis BGD, ergo ablata ABH, & repoſita

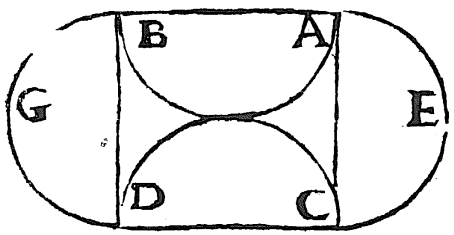


posita BGD, & ablata HCE reposita DCF, rectilineum GBHCF est æquale iam dicto arbilioni.



Potest & alio modo probari. semicirculus ABC est duplus semicirculi DBF, ergo vacuum ABDGFBC. est æquale semicirculo, dematur ex vtroq; portio DEF, DGF, ergo lunula DBFE est æqualis arbiloni DABGFBC, sed arbilon est æquale triangulo rectilineo DEF, ergo arbilon dictum triangulo DBF, est æquale.

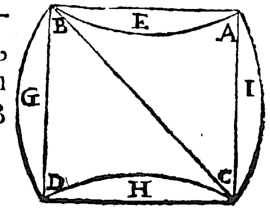
Quadratum curuilineum quadrare.
Prop. 8.



Esto quadratum curuilineum AFBGDFCE. trahantur quatuor lineæ ex angulis AB, BD, DC, CA, dico quadratum rectilineum ABCD curuilineo iam dicto præstabit. Quoniam sunt quatuor semicirculi æquales inuicem, tollantur AEC, BGD, reponantur AFB, CFD, sic rectilineum curuilineo æquale erit.

Alter Casus.

Potest & quadratum aliter fieri, ex quatuor etiam rectis angulis, vt diximus ABC. Quoniam portiones æqua-

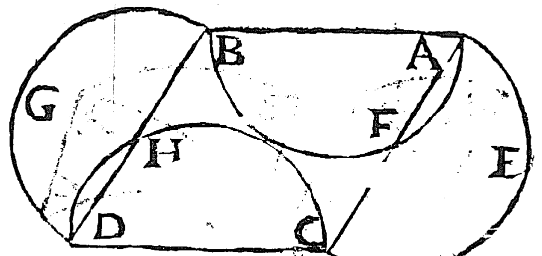


æquales sunt, & ex æqualibus circulis, ablatis portionibus AIC, BGD, repositisq. AEB, CHD rectilineum quadratum ABDC, curuilineo AEBGDHCIA æquipollebit.

Corollarium.

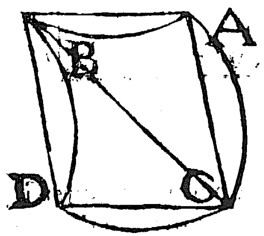
Hinc patere potest quadratum curuilineum ex aduersis, & conuersis circumferentijs constitutum recta diameter bifariam secat, latus AB, lateri AC æquale est, & basis BC communis vtrique, ergo triangulum CAB triangulo BDC æquale erit: igitur bifariam secat, & vtrumq. ex conuexo, & concauo æquali latere constat.

Rhombum curuilineum quadrare.
Prop. 8.



Et Rhombus curuilineus AFBGDHCE quadrabitur, ductis ex angulis rectis lineis AB, BD, DC, CA, nam demptis semicirculis AEC, DBG, repositisq. AFB, CHD, demptisq. portionibus HDAF, rectilineum Rhombum curuilineo æquabitur.

Alter Casus.

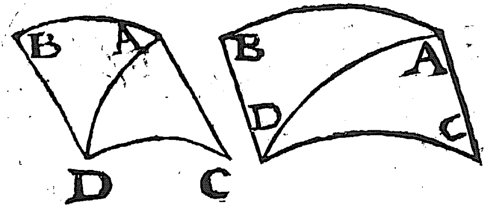


POtest esse Rhombus alio modo ex æqualibus circumferentijs AB, BD, DC, CA, & quoniam portiones æquales sunt, duabus demptis A C, C D, totidem repositis A B, B D erit rectilineo æqualis.

Corollarium.

EIusmodi etiam Rhombos recta dimetiens æqualiter secabit; nam hinc inde duo æqualia triangula constituent.

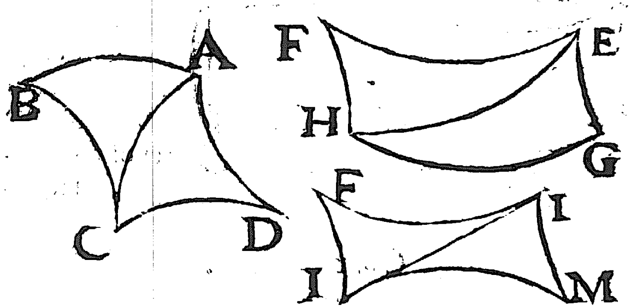
Rhombos, seu Rhomboides semicuruilineos quadrare. Prop. 9.



SEmicuruilineus Rhombus, & Rhomboides facilius quadrabitur: nam portione vna dempta, altera reposita, æquales erunt curuilinei rectilineis.

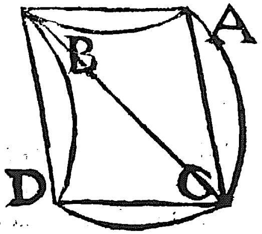
Corollarium.

SEd in istis, qui ex isoscelibus triangulis semicuruilineis constituuntur curua diameter circumferentiæ æqualis, & eos bifariam secabit; nam in duo æqualia isoscelia triangula diuiduntur semicuruilinea, vt ABD, ADC.

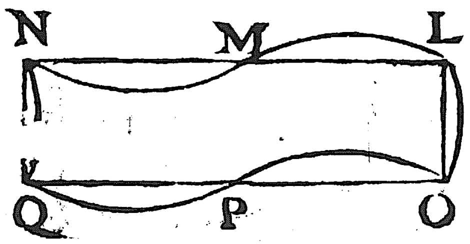


Possunt & alio modo Rhombos, & Rhomboides in Isoscelibus triangulis constitutos ex tribus conuersis, & vna auersa diametro per mediam diuidere, vt in Rhombo A B C D. Rhomboide E F G H, cum diameter A C, E H eos bifariam diuidat in duo Isoscelia æqualia A B C, A C D, & E H G, E H F, & in Rhomboide ex quatuor conuersis constituto diameter recta etiam I L in duo semitriangula æqualia diuidit ex oppositis angulis ducta.

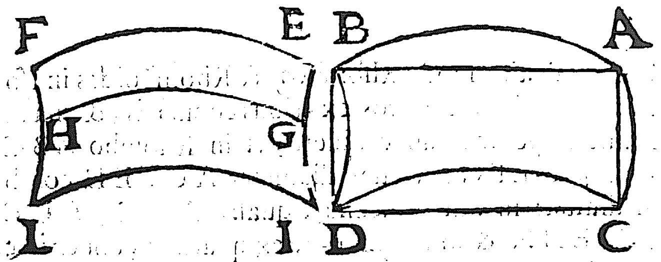
Altera parte curuilinea, & ſemicuruilinea quadrare. Prop. 10.



ALtera parte longiora quadrabis omnia, vt quadrata, duobus ſemper portionibus oppoſitis ablatis, & repoſitis, vt in ABCD. Erit altera ſpecies altera parte longioris curuilinei L N O Q demptis ſcilicet tribus portionibus LM, PQ, OL, repoſitis M N, O P, Q N, quadrabitur.



Corollarium.

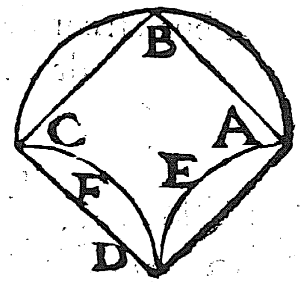


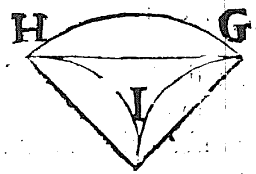
AT reliquas ſpecies diuides non dimetiente ex angulo ad angulum ducta, ſed per medium vtrinq. latera parallela, vt in E F I L dimetiens G H.

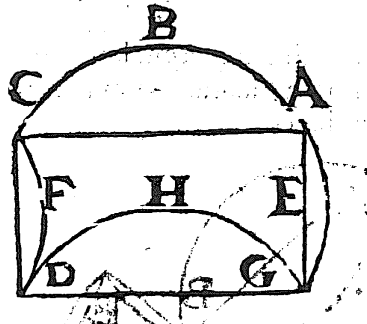
Pe-

Peleces quadrare. Prop. 11.

POſſunt peleces multifariam variare ex varijs circulorum circumferentijs, & primo ex partibus, cuius partes circumferentiæ dimidij circuli A B C, aliæ duæ partes ex duabus quartis eiuſdem circuli A E D, D F C, vt demptis illis, his repoſitis, rectilineum quadratum peleci æquale erit.



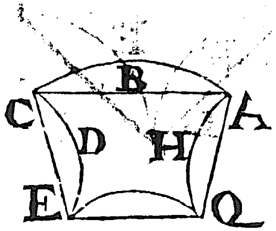




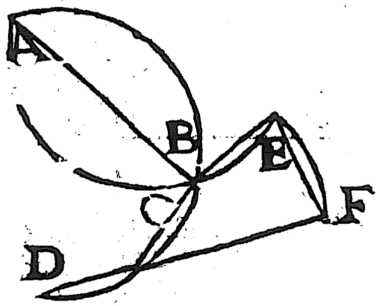
Poteſt & ex duplicis circumferentijs conſtitui, vt ſit G H quarta dupli, duæ vero quartæ ſubdupli G I, I H, quæ additæ rependent ablatum G H, eodem modo ex quadrupla eueniet. Pelecis ex inæqualibus, ſed eiſdem circumferentijs, & varijs, vt Pelecis G E A B C F D H quadranda portio A B C ſit æqualis G H D, & D F C, G E A, demantur A B C, reponantur G H D, D F C, & erit quadrilaterum rectilineum A C G D æquale ſupradictæ Peleci.

Trape-

Trapezia curuilinea ex æqualibus, & inæqualibus circumferentijs constituta quadrare. Prop. *12*.



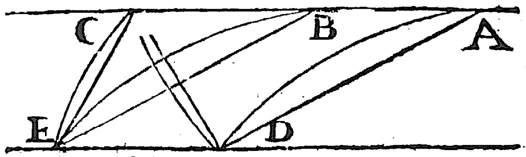
Sint Trapezia curuilinea ex quatuor, vel pluribus circumferentijs constituta, vel omnibus inæqualibus, vel tribus, aut duobus, dummodo inter eas ita conueniant, vt tres, duæ, aut plures possint, quantum vna, aut aliæ: nam sit portio A B C tripla, & sint tres æquales A H Q, Q F E, E D C, dematur maior, addantur tres minimæ, & coæquabitur rectilineum curuilineo.



At si Trapezium figuratum fuerit, vt ijsdẽ circumferentijs, & æqualibus constituatur, sed cũ alterũ altero longius sit, & quantum in altero deficit in altero superfit, minus addatur superfluo, & fiat æqua compensatio. A B duæ portiones demantur, addantur duobus alijs B C, C D, & quia pars E F superabit, deficit vero E B, huic addatur illius vice, sic rectilineum B E F D C B curuilineo æquabitur.

Trian-

Triangulum Isoscele curuilineum, & parallelogrammum semicuruilineum in eadem basi constituta, & eisdem parallelis, parallelogrammum triangulum duplum erit, & rectilineis æqualia erunt. Prop. *13*.

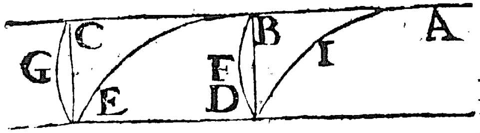


Sit triangulum Isoscele semicuruilineũ D C E, & parallelogrammum semicuruilineum ABDE in eisdem parallelis A C D E, dico parallelogrammum in eadem basi, & eisdem circumferentijs constitutum esse triangulo duplum. Quoniam portio D C ipsi C E æqualis, dematur E C, addatur D C, erit triangulum rectilineum D C E curuilineo æquale. Et quia portio A D ipsi B E æqualis, dematur B E, addatur D A erit rectilineum parallelogrammum ABDE semicuruilineo æquale, sed rectilineum A B D E triangulo D C E duplum est; quia in eadem basi, & eisdem parallelis constituta per 41. 1. Eucl. ergo parallelogrammum rectilineum curuilineo triangulo duplum.

Parallelogramma semicuruilinea in eadem basi, & æquidistantibus circumferentijs constituta, & inter parallelas æqualia sunt. Prop. *14*.

Sint duo parallelogramma B F D C G E, & A I D B H E in eadem basi D E, & in eisdem parallelis rectis A C, D E

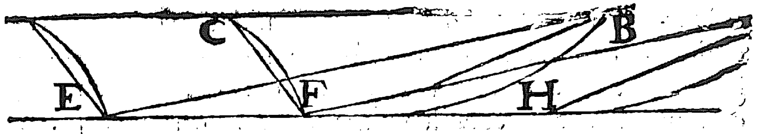
D E



D E constituta, dico inuicem esse æqualia: trahantur rectæ A D, B E, E C, quia portio BFD est æqualis CGE dematur CGE, reponatur B F D, rectangulum parallelogrammum curuilineo æquale. Idem dicendum de altero parallelogrammo AIDB-H.E curuilineo æquale est rectilineo ADBF, & quia parallelogramma rectilinea in eadem basi, & eisdem parallellis constituta ad inuicem sunt æqualia per 36. 1. Euclid. Idem & de parallelogrammis curuilineis dicendum.

Parallelogramma curuilinea, & semicuruilinea cum æqualibus basibus, & eisdem circumferentijs, & eisdem parallelis constituta inuicem sunt æqualia.

Prop. 15.

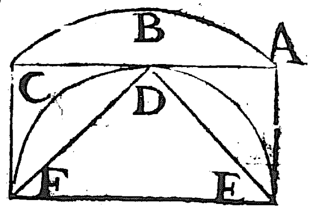


Sint duo parallelogramma semicuruilinea, & æquidistantibus circumferentijs AH, GB, & CF, DE, & æqualibus basibus constituta FE, GH, & in eisdem parallelis A D, H E dico esse inuicem æqualia, trahantur rectæ AH, BG, CF, DE, AF, B E, quia A H portio æqualis est B G, dempta AH reposita BG, erit rectilineum AHBG curuilineo æquale, & idem de alio CFDE, sed rectilineum AHBG curuilineo æquale, & idem de alio C F D E, sed rectilineum CFDE in eadem basi cum rectilineo ABFE, & ABFE in eadem cum A H B G, ergo inuicem æqualia per 26. 1. Euclid. ergo &c.

Paral-

Parallelogramma semicuruilinea in eisdem parallelis constituta, & ex diuersis circumferentijs videlicet duplis dari possunt rectilineis æqualia.

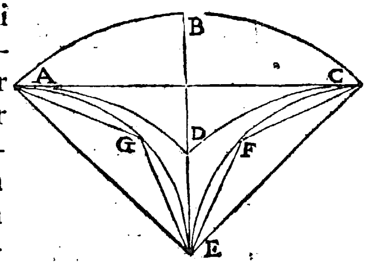
Prop. 16.



Sit parallelogrammum semicuruilineum E A B C F D E, & sit portio CBA dupli, subdupli autem semicirculus F D, dico quadrari posse, trahatur linea C A, & F D, D E, quia duæ portiones subdupli F D, D E valent quantum vna subdupli CBA, dematur C B A, reponantur duæ subdupli F D, D E, rectilineum E A C F D valet quantum semicuruilineum.

Triangulum tricuspidale quadrare.

Prop. 17.

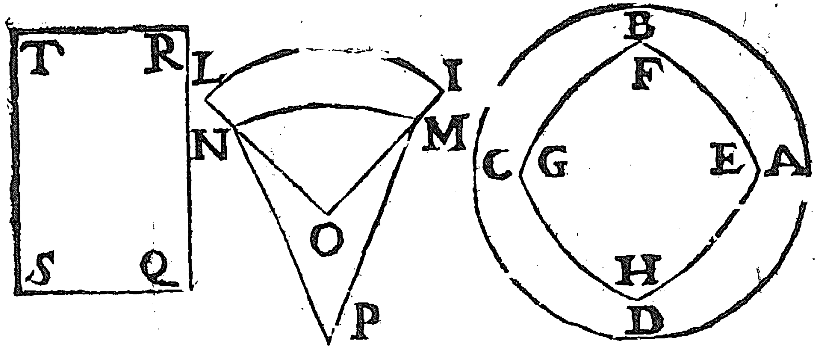


Ex quarta nostri secundi repræsentetur figura AB-C F E G, à medio AC trahatur linea BE, & linea E B signetur in linea B E, linea CD ex eadem dupli circumferentia idem ex altera parte, dico triangulum tricuspidale ADCFEGA quadrari posse, diuidantur EC, EA bifariã in FG, & trahatur lineę E F, F E, E G, G A, sic, & lineæ D C, D A, quia D C portio est octaua pars sui circuli, portiones EF, GC duæ octauæ subdupli æquipollent vnam dupli, sic eam demendo, has adden-

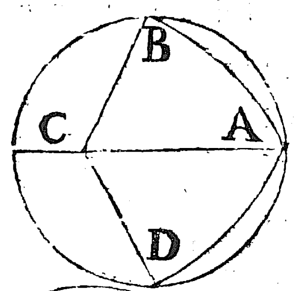
H do,

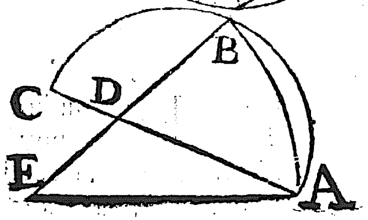
do, trapezium EFCD rectilineum respondet curuilineo EFCD, idem de alia parte dicendum, & multifariam potest euenire.

Coronas quadrare. *Prop*. 18.



Sit quadranda Corona ABCDEFGH, pono eius quadrantem ILO, & ibi comparem octauã partem circuli dupli MNE, tollatur cõmune MNO, remanet tricuspidale triangulũ quadrilaterũ MONP æquale quartę parti coronę IMLN, quæ æqualis ABEF, quadruplicetur cuspidale triangulũ, & erit ipsius area QRST æqualis coronæ propositę.

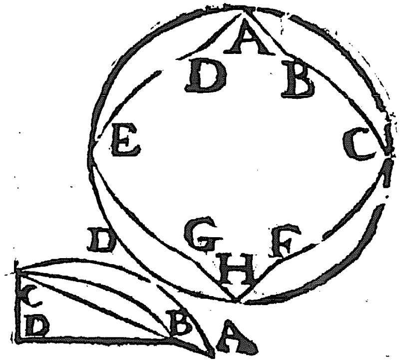




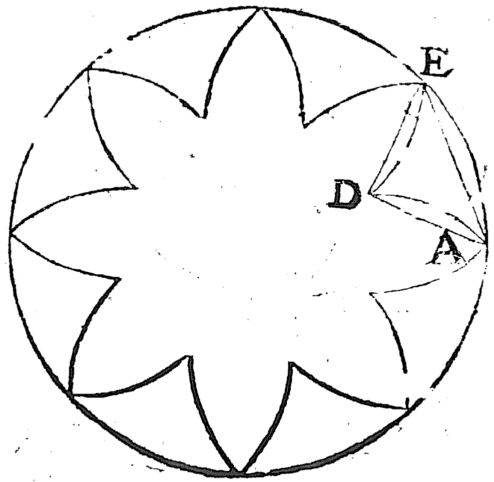
Eodem modo quarta pars semicirculi dupli ABE absumit dimidium circulũ ABC subduplum, tollatur commune triangulũ ABD, remanet ADE triangulum rectilineum æquale Lunæ AB, & circuli BDC, quo duplato æquipollet coronę ABCD.

Sit

Sit portio ADCB, æquipollet dimidiæ duplæ BCD, tollatur commune BC, remanet triãgulum BCD æquipollens semilunulæ ABCD, sic quatuor triãgula BFGD absumunt coronam CBADEGHF.

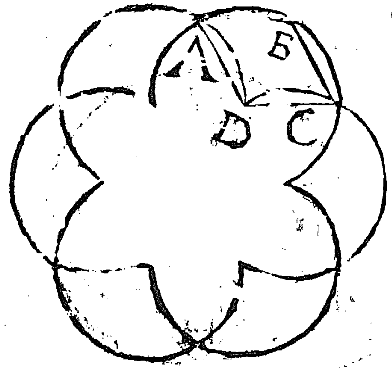


Per quartam nostri secundi quadratur triangulum curuilineum ADE per rectilineum quadrangulum ABCD, sex igitur eiusmodi quadrãgula totam coronam absorbent.



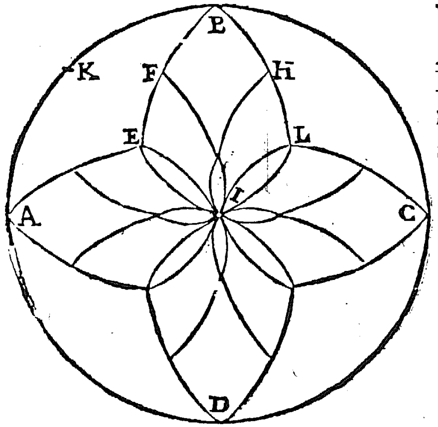
Eodem modo alia coronæ species quadratur, & sit eius pars AED, cuius maior circulus AE sit duplus AD,

H & sit



& ſit A D octaua pars ſui circuli, & A E ſui circuli, duæ igitur portiones A D, D E æquipollent vni maiori: octo igitur eiuſmodi triangula reſpondent propoſitæ coronæ.

Corona ſemiquadranda.

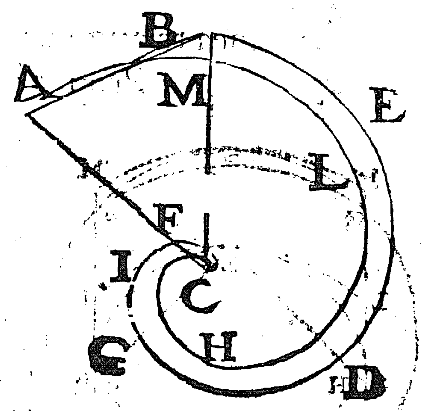


Esto circulus ABCD cuius quadrans A-BI, triangulum ABE notum eſt, quia AE, E B æquales ſunt circumferentiæ A K, K B, reliqua pars quarta E F B H L I, quia B F, B H æquales ſunt G F, G H, tolle F B, B H, repone G F G H erit nota pars F B, H G, reliqua pars E F, I G nota eſt, quia æqualis FE, EI, tolle, & repone nota erit pars illa, remanent ergo 4. portiones I G.

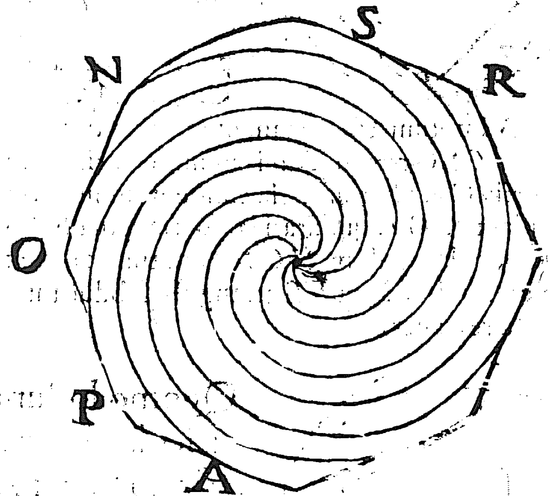
Volutas omnifarias quadrare. Prop. 19.

Est voluta figuræ ſpecies in cocleæ modum ſinuata, cuius ambiens perpetuo flexu ducitur binis in ſe quodammo-

dammodo recuruis, & refractis lineis.



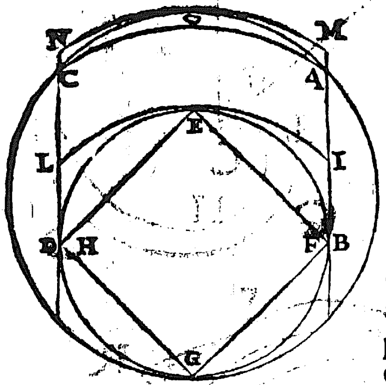
Propoſitum ergo ſit quadrare volutam BEDGIFCHLMA ſcio hanc volutam octauam eſſe partem volutæ circuli NOPQRS, & omnes circuli volutæ non capiunt niſi octogoni aream, ergo vnaquæque octauam partem com-



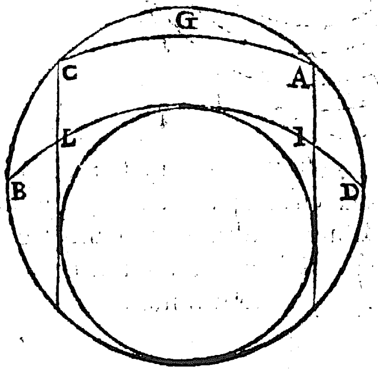
plectitur: vna igitur volutæ pars eſt BEDGIFCHLMA eſt octaua circuli pars, & octaua circuli pars eſt triangulum A B C, ergo tota propoſita voluta quadrata triangulo metitur. Poſſumus, & hoc modo cyſſoidem triangulum etiam quadrare, quod vidimus in 5. propoſitione huius.

Curui-

Curuilinea triangula aliqua quadrare. Prop. 20.



SIt circulus duplus AMNC, subduplus vero EFGH, seq. in puncto contingant G abscindantur à duplo duæ portiones quadrati CN, AM, & à subduplo quatuor quadrati E F, FG, GH. HE remanent vacua CDEBA, BMG, GNH æqualia quadrato E F, G H puncto E; ducatur parallela CA, & fit L O quadrangulum C L A I notum est, remanent quatuor triangula L D E, EIB, AMO, CNO puncto dupli circumferentia ducatur MN, & ex punctis C A alia parallela eiusdem circumferentiæ CA, dico lunulam C O A quadrari posse triangula N C O, O A M nota sunt, quadrangulum N C M A notum, quia ex parallelis circumferentijs, à quo si triangula subducantur C O A lunula nota remanet.

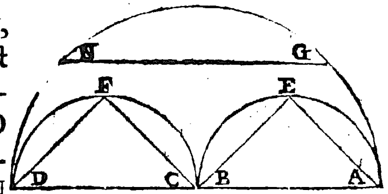


Quomodo lunæ cornicula quadrari possint. Prop. 21.

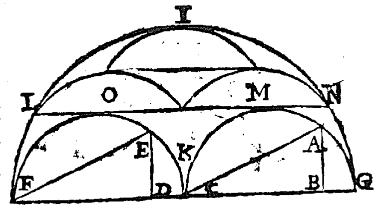
REmaneat superior descriptio, & in semicirculo B G D describatur dupli circumferentia BLID à punctis BD, lunula igitur BG-

BGADILB nota est, lunula parua nota est C G A, quadrangulum C L A I notum etiam ex anteriori, remanent ergo corniculi C B L, A I D etiam noti.

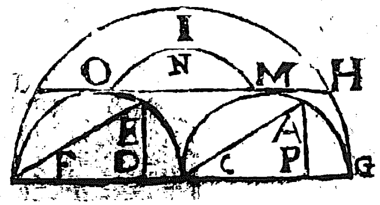
Trapezia multa curuilinea quadrare. Prop. 22.



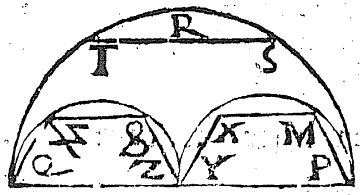
POssumus quadrare Trapezium AGNDFCBEA, quia semicirculus AGND est quadruplus AEB per 20. nostri, duo semicirculi AEB, CFD valent quantum arbilon AGNDCBA, dematur portio GN quarta circuli pars, & 4. portiones AE, EB, CF, FD, remanent duo triangula rectilinea AEB, C F D æqualia trapezio curuilineo iam dicto.



Eadem ratio erit in trigono. sit trigoni portio LIN, & duo circuli FED, CAG, à quibus duæ portiones FE, CA, & duæ dimidiæ ED, AG, quæ vnam integrant, altera erit O I M, arbilon FLINGMCO valet duos semicirculos, à quibus si tres dempseris portiones, tres item ab arbilone, vacua FLO, OKM, MNG, NMI, IOL valent duo trigona FED, CAB.

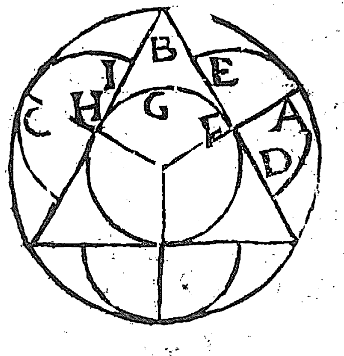


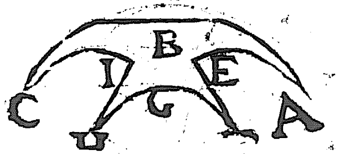
Eadem ratio erit in exagono, & trigono, nam in trigono in circulo GHILF, duo trigona APC, DEF, æquipollent vacuis GHM, MOC, OLF, HILONM, & in exagono P S R T Q, duo



duo ſemiexagona P M X Y, & Z 8 x Q, valet vacuum P S T Q Y Z, in linea H L, tangens circumferentiam circulorum eſt latus trigoni æqui lateri per 12.13. Eucl.

Circulus A B C, eſt quadruplus D A E, ergo pars tertia circuli A B C, quæ eſt A B C, eſt vnius circuli, & tertiæ partis, pars eius tertia eſt F G H, reliquum ergo erit corona A B C H G F dematur duo quadrantes circuli A E F, C H I, remanet vacuum AEFGHICBA, quantitatis dimidij circuli, & quia



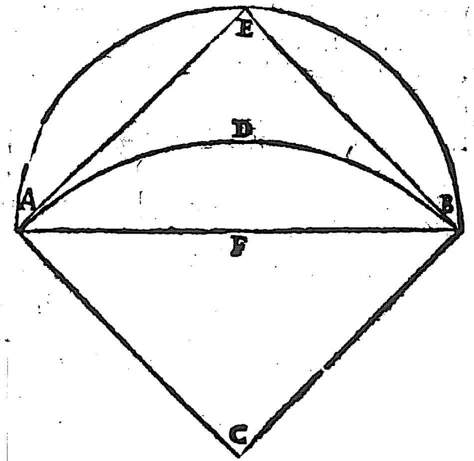


octaua pars circuli maioris, valet quatuor minoris dematur portio B ex maiori, & 4. 8. ex minori L M, M N, N O, O P, ergo rectilineam LMNOP, valet trapeſium AEFGHICBA.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Tertius.

In quo de Circuli quadratura agitur.

Lunulam ex dupla, & ſubdupla proportione quadrare. Prop. *1.*



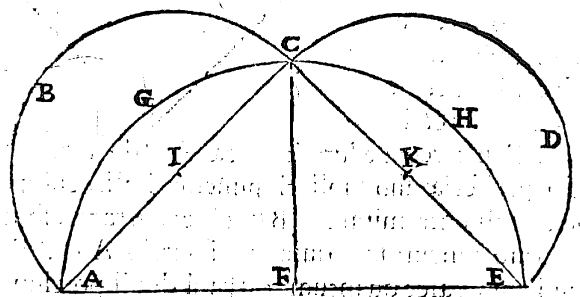
DEſcripto duplis circuli quadrāte his characteribus diſtinguatur ADBC, cuius ſubtenſam A B, ſcinde bifariam, & punctus ſciſſionis adamuſſim medius F charactere ſortiatur, in quo circini pede infixo ex FA interuallo circumducto ſemiambitum ſubdupli AEB ducito, aio triangulum rectilineum ABC interceptæ lunulæ areæ AEBD æqualem eſſe. In medio periferiæ ſubdupli E punctus inſtituendus, & ab vtraque circuli extremitate A B lineæ excurrant vſque ad E, ibique mutuo concurrant, quia dupli portio A D B F quarta ſui circuli pars valet quantum duæ ſubdupli portiones A E, E B, etiam ſui circuli pars quarta (per 20. primi noſtri) ideo ſubductis portionibus A E, E B, appoſita A D B (per primum axioma noſtri ſecundi libri) triangulum ABC valet quantum lunula AEBD, quod erat demonſtrandum.

Hyppocrates hoc aliter probat in primo Phyſicorum Ariſtotelis, quia quadrans dupli ADBC valet quantum ſemicirculus ſubdupli AEB, abſciſſa portione communi A D B, quæ inter vtrumque interiecta eſt, remanet trimetrum A B C æquale lunulæ AEBD, quadrandæ.

Conſectarium.

Ex hoc circumferentia dupli tranſibit ſemper per extremitates diametri ſubdupli, quod in alijs non euenit; quia angulus in ſemicirculo A E B rectus eſt (per 31. 3. Euclid.) quadrata A E, E B æqualia ſunt quadrato A B, & quadrantis dupli angulus ACB etiam rectus eſt, ergo quadrata AC, CB æqualia ſunt quadrato AB, ob id recta linea ſubtenſa quadrantis dupli eadem eſt cum diametro ſubdupli.

Duas lunulas æquales in dupla, & ſubdupla proportione exaratas ſeorſim quadrare. Prop. 2.



Eodem modo hoc commodiſſime abſoluemus. Eſto circulus

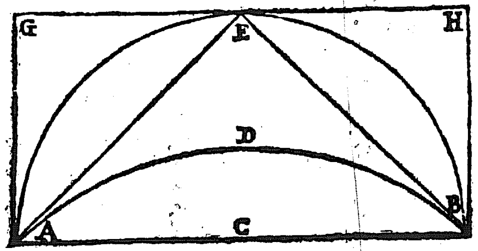
culus dupli A C E, & diametri extremitatibus A E binæ lineæ in medium circuli anfractum excurrant, & vbi mutuo contactu angulum efficiunt, illic C litera exaretur. Subtenſæ AC, CE in medio ductu præcidantur, præfixis literis I K, mox aſſumpto circino ad rem commodè proferendam, pede vno in I infixo ſubſiſtente I A interuallo linea circumducatur vſque donec ad alteram extremitatem C perueniat, inuariatoq. circini pede K puncto compari linearum perſcriptione circuli ſemianfractum deſignet A D E. Hoc peracto puncto F lineæ in plano iacentis perpendicularis extollatur, quæ in cuſpide curuaturam C contingat, aio lunulas A B C G, C D E H, æquales eſſe trimetro A C E. Quoniam circulus A C E duplex eſt A B C, C D E, ergo ſemicirculus A B C, C D E æquales ſunt ſemicirculo A C E, amputentur duæ communes portiones A G C, C H E, reſidua rectilinea triangula A C F, F C E æqualia ſunt lunulis ABGC, CDEH vel modo, quo ſupra præcepimus triangulum dupli A G C F æquale eſt ſemicirculo ABC, & triangulum F C H E æquale ſemicirculo C D E, ſubductis communibus portionibus AGC, C H E, triangulum A C E, eſt æquale duobus lunulis A B G C, C D E H.

Conſectarium.

Antequam vltra progrediar conſentaneum duxi adnotandum angulum rectum A C E bifariam diſſectum in C ex (per 8. 6. Euclid.) E C, ad C A rationem habet vt E F ad F A, & ſic triangulum C F E ad triangulum C A F (per primum 6. Euclid.) & quia æqualia ſunt, lunulæ quoque æquales ſunt.

Vacans ſpacium, quod intra figuras omnes notas interuenerit quadrare.

Prop. 3.

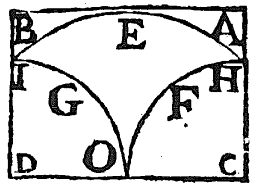


Recta linea A B dirigenda eſt, & ab eius vmbilici medio puncto C ſemiorbis circumducendus eſt A E B, completo ſemiorbi A C B, lunula complenda eſt more A E B D, mox laterales lineæ erigendæ ab extremitatibus A B ſunt, & medio eius puncto E ſuperior linea exaretur ipſi A B æquidiſtant, vt vltro, citroq. ſemicirculum tangant, etiam hiſce lateribus parallelogrammum exprimant AGHB, demum ab extremitatibus A B, medio puncto E tranſuerſas lineas ſortiatur A E; E B. Quoniam parallelogrammum GABH ſemicirculum continet, & eſt ſui quadrati dimidium, ſemicirculus lunulam continet AEBD, & lunula AEBD ſuo triangulo AEB æqualis eſt, & triangulum AEB ſui parallelogrammi dimidium eſt, ergo interceptæ areolæ AGE, EHB, ADB, quæ lunulam A B ambiunt, æquales ſunt ipſi lunulæ areolæ, ergo ſui amplexantis parallelogrammi dimidium ſunt.

Conſectarium.

Ex hoc perſpicuum eſt lunulam ſui quadrati partem eſſe quartam; nam ſi lunula ſui obſepientis parallelogrammi dimidium eſt, & parallelogrammum ſui quadrati dimi-

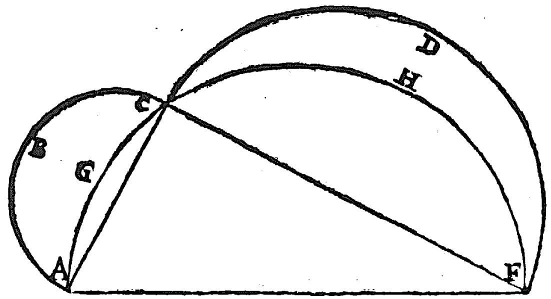
dimidium; igitur lunula ſui quadrati dimidium erit.



Vel ſi cuiuſcunque figuræ notæ vacua quadrare velimus modo ſupra cognito nota figura circumclaudatur, quam ſi à nota ſubtrahes, optato potieris ex ſecundo axiomate (ſecundi noſtri) ſit gratia exempli pelecis HEIGOF ſæpienda ſuo parallelogrammo A B C D, quam ab ipſo ſeduces, ſic incluſæ areæ HAE, EBI, IGOD, OCHF reſiduum innoteſcet.

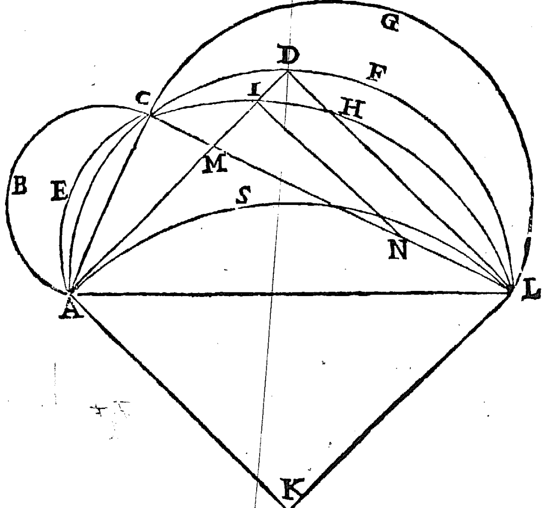
Duas quaſcunque lunulas inæquales in ſemicirculo ſitas ſimul quadrare.

Prop. 4.



Triangulum rectilineum inſemicirculari linea definiri debet, quod tribus notis diſtinximus ACE, ſupra eius latera ſemicirculi incubabunt ABC, CDE, quibus congruens area adinuenienda eſt, inquam angulus A C E in ſemicirculo rectus eſt, & bini ſemicirculi A B C, C D E æquales ſunt ſemicirculo AGCHE ex eis, quæ ſupra habita ſunt, reiectis communibus portionibus AGC, CHE relictæ ſemilunulæ A B C G, C D E H reſiduo triangulo ACE rectilineo æquiparantur.

At



At si perfectæ fuerint lunulæ quocunq. modo inæquales, semper orthogonio à circuli medio ad substratam basim deducendo æquales erunt. sit iacens linea A L, supra semicirculus struatur ACFL, ab extremitatibus A L orthogonium quodcunque struatur triangulum A C L, cuius laterum ductum rectum angulum in C constituant supra latera AC,CL, Ambientes semicirculi consurgant ABC, CGL, & in eis perfectæ lunulæ ex more designentur A B C E, CGLH. His peractis in verticis sinuosæ lineæ puncto D ab diametri extremitatibus A L duo latera consurgant, vt orthogonium triangulum ADL constituant, aio dictas perfectas lunulas ABCE, CGLH, in circulo A C D F L descriptum semper dicto triangulo ADL æquales esse: Quoniam lunulæ A B C E, C G L H æquales sunt triangulo orthgonio A D L semper ex secunda huius.

Potest & alia probandi ratio suscipi. Triangulo A D L super lineam AL descripto, aliud triangulum æquale infra lineam AL designetur, & sit ALK, & puncto K circini pede fixo,

fixo, altero vago in A collocato sinuosa linea ducatur vsque ad L. Quoniam duæ lunulæ perfectæ ABCE, CGLH æquales sunt vni lunulæ ASL (ex prima huius) & lunula ACDFLS est æqualis triangulo A K L, quod idem est cum triangulo A D L.

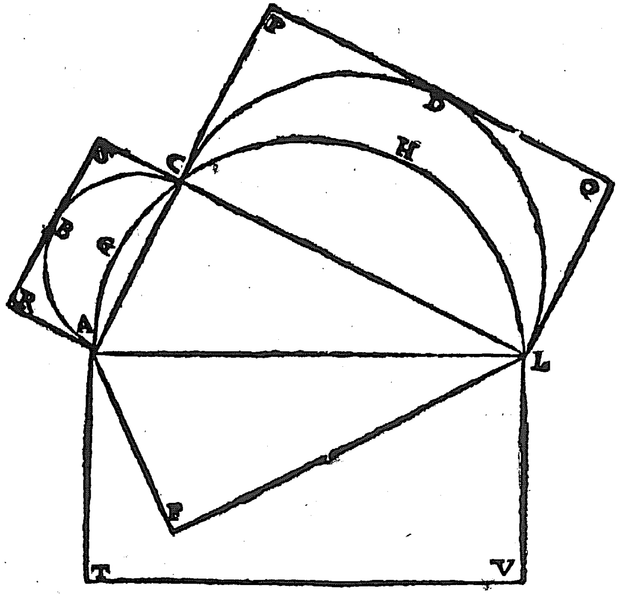
Consectarium.

EX hoc animaduertendum imperfectæ lunulæ quanto magis à semicirculi vertice declinant, tanto minores fieri, vt in triangulo A C L videre est, quod triangulo ADL minus est, & qui defectum conspicere quæsierit, triangulum ACM à triangulo MDL subducat hoc modo, à linea M D, linea M C præcidat, & à linea M L lineam M A obtruncet, & lineam M N ducat, triangulum M I N æquale erit ACM, reliquum triangulum I D N erit quantitas lunulæ I D M L, dempla lunula A E C.

Vacua inter lunulas intermissa quadrare.
Prop. 5.

AT vero interuenientia vacua circa lunulas si quadrare quæsieris, ita quadrabis. Esto minor lunula A B C G, maior C D L H imperamus semicuruilinea triangula inania inter illas, in rectilineas figuras reddere scilicet C P D, D Q L, C H L, A R B, B S C, A G C, circumscribantur parallelogrammata tangentia earum ambientes lineas P Q C L, A R S C, & fiat alterum parallelogrammum ex binis A L, T V, & sit A L T V, & fiat triangulum ACL æquale A F L (per 31. primi Euclid.) quibus ita dispositis i..quam vacuum circa A T V L F æquale esse imperatis vacuis.

cuis. Quoniam triangulum A F L est æquale A C L ex

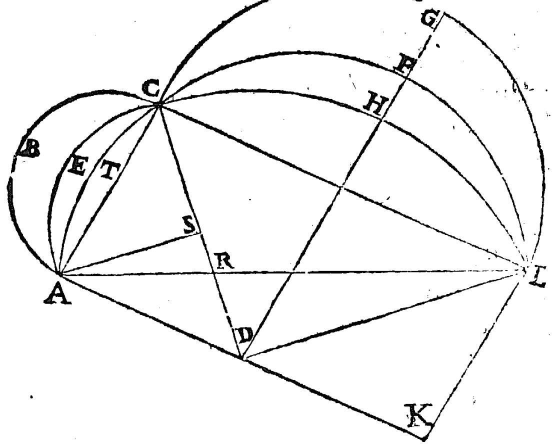


constitutione, & triangulum ACL est æquale lunulis CDLH, & A B C G, ergo si triangulum A F L à parallelogrammo A T L V abstuleris, reliquum vacuum A T V L F erit æquale interiectis vacuis iam recensitis.

Duas lunulas inæquales in semicirculi ambitu descriptas seorsum quadrare.

Prop. 6.

ESTO rectangulum triangulum A C L, cuius porrectius latus C L sit duplum exilioris AC, & circumferantur lunulę ex more, quibus adijce suas literas indices C G L F, & A B C T, mox parallelogrammum constituatur ex lateribus



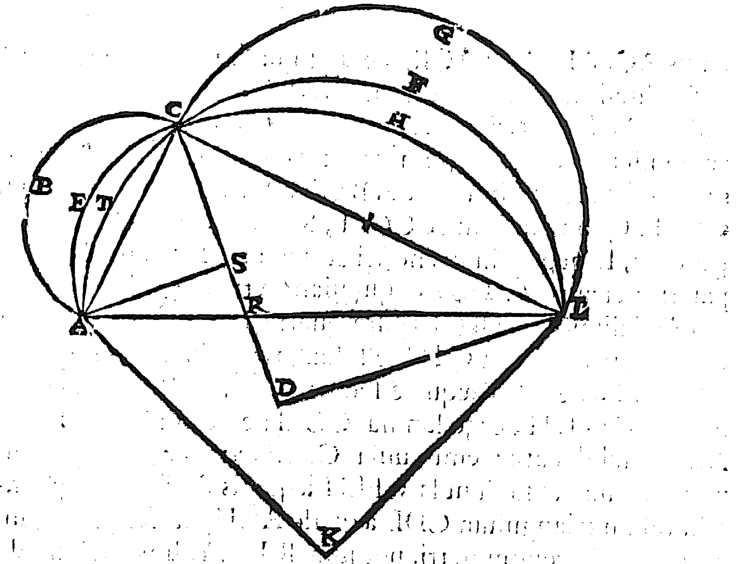
ribus AC, CL, & fit ACKL, & fiat quadrans circuli CDLH, & subdupli AECS, nos rationem reddituri, lineam CR triangulum ACL partiri taliter, vt anguli compares mutuo correspondentes, & æquales sint, vt ACR par sit RDL & triangulum A C R par sit lunulæ A B C T, & triangulum CRL ipsi CGLF. Quoniam lunulæ CGLF, & ABCT pares sunt triangulo ACL quarta huius nostri adiuuante, & triangulo ACL par trimetrum C D L, quoniam vtrique sui parallelogrammi dimidium est (vt figura quarta huius demonstratum est) ergo triangulum C D L est duabus præsignatis iam lunulis CGLF, & ABCT æquale, sed triangulum CDL est æquale lunulæ C G L H, ergo lunula CGLH est æqualis CGLF, & ABCT subducatur semilunula CGLF, vtpote vtrique communis, remanet sublunula CFLH æqualis ABCT, & quemadmodum triangulum CDL æquale ACL, subducatur commune C R L, reliquum triangulum R D L reliquo triangulo ACR æquale, lunularū partium repręsentantia, sequitur triangulum

K

gulum RDL esse æquale sublunulæ C F L H, & triangulum ACR æquale lunulæ ABCT, à quo si triangulum ACS subtrahatur, æquale lunulæ ABCE (per primam huius) remanet subtriangulum ASR imæ lunulæ A E C T par, quod erat demonstrandum.

Vel hoc modo si triangulum A C L æquale est lunulis A B C T, C G L F, compleatur triangulum C R L, & compleatur perfecta lunula, quę sit CGLH, ergo addita pars trian guli RDL æqualis erit additæ lunulæ CFLH, sed pars trianguli addita RDL æqualis est triangulo A C R, vt vidimus, & par est lunula ABCT lunulæ CFLH.

Vel hoc modo. Tres lunulæ ABCE, CGLF, AECT sunt æquales trigono ACL, & duæ lunulæ CGLF, CFLH trigono C D L, ergo omnes quatuor iam dictæ lunulæ sunt æquales duobus trigonis A C R, & C D L, sed tres lunulę A B C E,

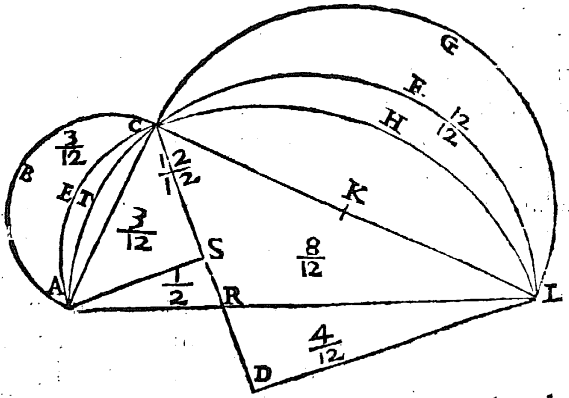


C G L F, L F C H sunt æquales trigono ALK, ergo reliqua

lunula A E C T est æqualis trigono A S R, quod quærebamus.

Vel tres lunulę A B C E, AECT, CGFL æquales sunt trigono ACL, & trigonum CDL æquale lunulę CGLH, tolle triangulum CDL ęquale iam dictę lunulę CGLH, reliquum triangulum ACR lunulis ABCE, AECT æquale est, tolle lunulam perfectam A B C E sub lunula A E C T sub triangulo A S R æqualis erit, quod erat demonstrandum.

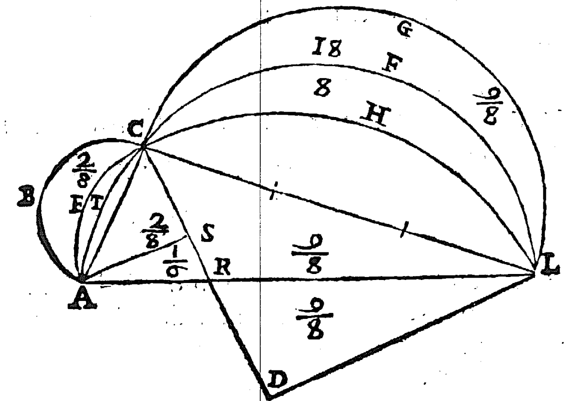
Trianguli in circulo descripti angulo per medium discisso, & lunulis à circulo medio diuisis, proportio partis maioris trianguli ad minorem, est sicut superior pars maioris lunulæ ad inferiorem, & superior eadem pars ad minorem lunulam, & superior pars trianguli ad inferiorem sequitur eam suarum lunularum. Prop. 7.



Priusquam ad diuersarum partium rationem lunularum deſcendamus, admonitione dignum cenſemus, quod cum ab æqualitate duarum lunularum deſcendimus, quam (in ſecunda parte) vidimus, quantum maior creſcit, tantum altera decreſcit, & ex alterius defectione altera augumentũ ſuſcipit, & circulus ille, qui per medium vtriuſque percurrit, à maiori ſemicirculo ſubripit, & minori addit, ſed id non temerè, ſed certo ſe ſuperant exceſſu, vt ratio maioris ſuperioris lunulę ad inferiorem eadem ſit, quam maioris ſuperioris trianguli pars ad inferiorem, & ratio maioris ſuperioris lunulę ad totam minorem, vt ratio partis trianguli anterioris ad poſteriorem eandem ſequuntur analogiam, & vtraque vtriuſq; rationem ſequitur, vt exemplis patebit. Triangulum rectangulum ſtrue, cuius angulis appinges literas ACL, productius latus CL in duas partes, anguſtius in vnam partiri. In puncto bifariæ ſciſſionis lateris CL ſigna K, ex quo, & interuallo CK circinationis arcus exaretur, cui ſuas indices literas applicabis CGL, eodemq. ordine ſigna AC ſuum arcum delinea ABC, mox triangulum maioris circuli CGL conſtitues, & ſit CDL, & minoris ABCE, ſit ACS ſupra ſuccumbentem omnium baſim AL, medius circulus flectatur ACFL, dico lunulam ſuperiorem maioris circuli CGLF ad ſuam inferiorem CFLH, eandem habere rationem, quam ſuperior pars trianguli CRL ad inferiorem RDL, & eadem ſuperior pars lunulę maioris CGLF ad totam minorem ABCT, quam triangulum CRL ad ſuum ſequentem ACR.

Quod vt facilius cognoſcamus ad hoc demonſtrandum adhibeo numerorum officium, & vt facilius proportiones obſeruemus cum fractis integros numeros in fractiones ſoluamus, vt vnum denominatorem habeamus. Quoniam lineam CL in duas partes diuiſimus erit eius quadratum quatuor partium, cuius pars quarta, ideſt vnitas eſt, hanc in duodecimas ſoluemus, ideſt $\frac{12}{12}$, erit ergo totum triangulum ACL $\frac{12}{12}$, & quia linea CL ad CA, duplam habet proportionem, ita RL ad RA, & ſic triangulum CRL ad triangulum CAR, ergo trian-

gulum CRL erit $\frac{8}{12}$, & triangulum ACR $\frac{4}{12}$. Ergo tota lunula perfecta CGLH $\frac{12}{12}$ erit ſuperior lunula maioris circuli CGLF cum duabus lunulis ABCT ſimul iunctæ ſunt $\frac{12}{12}$. Triãgulum CDL erat $\frac{12}{12}$, ſi ſuperior pars erat $\frac{8}{12}$ inferior RDL erit $\frac{4}{12}$, & quia tota perfecta lunula CGLH eſt $\frac{12}{12}$, vt proportio quadrupli ſeruetur, quam habet ad minorem perfectam ABCE $\frac{3}{12}$, & triangulum ACS erit ei par $\frac{3}{12}$, inferior ergo pars $\frac{1}{12}$, & cum nullus melior congruat ſublunularum partibus ſit ſublunula AECT $\frac{1}{12}$, ſic ſuperior pars maioris lunulæ $\frac{8}{12}$ inferior $\frac{4}{12}$. Vnde proportio trianguli ſuperioris CRL ad inferiorem BDL erit dupla, vt ſuperior maioris lunulæ pars CGLH ad inferiorem etiam dupla, ideſt $\frac{8}{12}$ ad $\frac{4}{12}$, & proportio ſuperioris lunulæ pars CGLF ad lunulas ABCT etiam dupla eſt, ſed ſuperior minor lunula ad inferiorem tripla eſt, vt $\frac{3}{12}$ ad $\frac{1}{12}$, ſic triangulum ſuperius ACS ad ASR, vt $\frac{3}{12}$ ad $\frac{1}{12}$.



Subijciatur aliud exemplum in tripla diuiſione ſupra lineam porrectam AL, circulum effingamus ACFL, mox in eo triangulum deſcribendum, vt rectus angulus C literam poſſideat, cuius latus vnum longius CL tres partes, minus AC, vnam ſortiatur in ſtruendis ibi commodè ſemicirculis CGL maior,

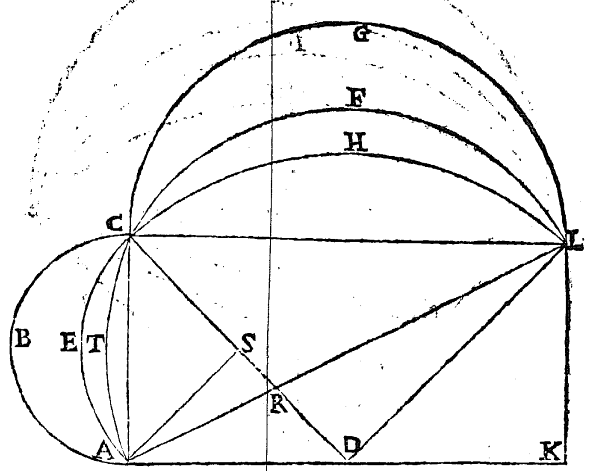
maior, ABC minor. Inde perfectæ lunulæ ex ordine subsignentur, ideſt trianguli CDL, CGLH, trianguli ACS, ABCE.

Triangulum ACL, quia linea eſt trium partium, area erit $\frac{12}{8}$, proportio CRL ad ACR eſt tripla, ob id triangulum CRL erit $\frac{9}{8}$, & triangulum ACR $\frac{3}{8}$, triangulum CDE latus trium eſt partium, quadrans eſt nouem partium, cuius quarta pars eſt $2\frac{1}{4}$, ideſt $\frac{18}{8}$ ſupra ſunt trianguli CRL $\frac{9}{8}$, ergo triangulum RDL erit $\frac{9}{8}$, tres lunulæ ABCE, AECT, CGLF eſt $\frac{12}{8}$ ſuperior maior ad duas minores eſt tripla, ergo lunula ſuperior eſt $\frac{9}{8}$, & duæ lunulæ ABCE, AECT eſt $\frac{3}{8}$, ſed lunula perfecta eſt $\frac{2}{8}$, ergo ſuperius triangulum CAS $\frac{2}{8}$ ſubditum reliqui erit $\frac{1}{8}$ & ſublunula reliqua $\frac{1}{8}$ inferior maior lunula, vt compleat numerum $\frac{18}{8}$ erit $\frac{9}{8}$, ergo proportio lunula ſuperior ad inferiorem, ideſt CGLF ad CFLH ſicut triangulum CRL ad RLD, & lunula EGLF ad lunulas ABCT, & ſuperior lunula minor ad inferiorem, vt triangulum ACS ad triangulum ASR.

Datam maioris lunulam circuli ita ſecare, vt eius ſublunula minori lunulæ, & ſublunulæ par ſit. Prop. 8.

QVamquam in ſupra commonitis idem indicauerimus, vberioris tamen doctrinæ gratia exemplum in hunc modum abſoluemus. in hanc rationem triangulum orthogonium eligendum eſt ACL, cuius porrectius latus CL bifariam diſpeſcemus, ſupra lunulas ex more conſtituemus, & medium circulum ATCFL, & eis triangula ſubijciemus CDL, ACR, mox datis lineis AC, CL parallelogrammum conſtituatur CALK, inquam ſublunulam CFLH, lunulis ABCT æqualem eſſe. Quoniam lunula CGLH æqualis eſt ſuo triangulo

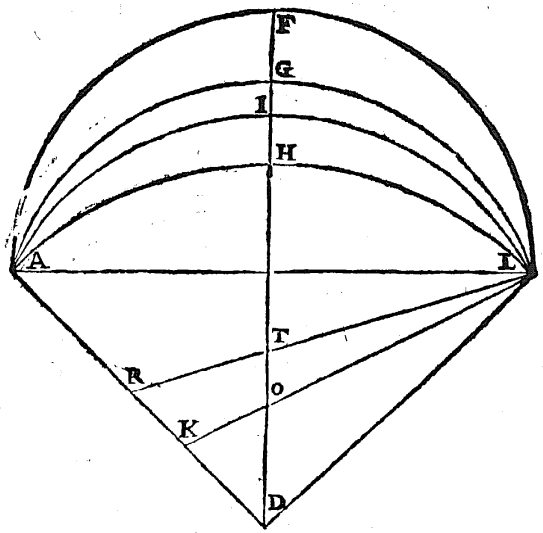
lo CDL, & triangulum CDL æquale triangulo CAL, quia



vtrumque eſt æquale ſuo parallelogrammo dimidio CALK, & triangulum ACL eſt æquale lunulæ CGLF, & lunulis ABCT, ergo lunula CFLH eſt æqualis lunulis ABCE, & AECT, tollatur de medio lunula CGLF, remanebit ſublunula CFLH æqualis ABCT, quod erat diſcutiendum.

Datam dupli, & ſubdupli circuli lunulam ad imperatas partes diſcindere. Prop. 9.

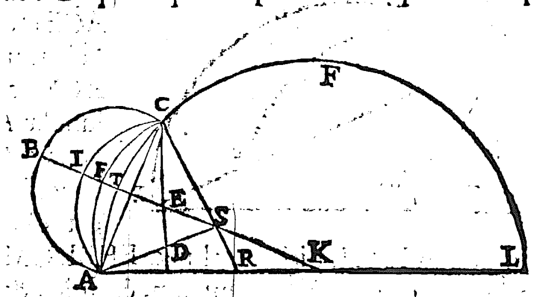
ESto dupli, & ſubdupli multifariam ſcindenda lunula AFLH, cuius ſubtenſa AL, ſui compar triangulum inferius ſubſtituemus ADL à medio inflexi circuli vertice F vſq; ad trianguli aciem infernè poſitam D recto ductu deſcendat. In dextro trianguli latere AD futuræ lineæ deſignandæ ſunt lunulam



nulam diuisuræ in quotcunque partes volueris decem, vel septemdecim, pro nunc bifariam in R dispescito, & transuersam ad L deducito, si velis lunulæ mediam partem auferre, & vbi se lineæ cum diametri linea decussabunt, fige circini pedem fixum, & vagum alterum ad alterutrius diametri extremitatem A, vel L, arcum circumflecte A G L, nam lunula AFLG erit dimidium lunulæ. Vel si tertiam partem vis auferre, sit latera K in laterali tractu tertia pars ab K ad L lineam porrigito, & vbi FD lineam secat, pede circini stabili collocato, ac vago altero ad A extremum, arcum circumduces A I L, & tertiam lunulæ partem A I LH à duobus abscindet. Quoniam triangulum ADL per RL lineam bifariam dissectum est, superior trianguli pars ARL per superexaratam propositionem superiori lunulæ parti AFLG congruit, & ima trianguli pars RDL imæ lunulæ parti correspondet, & vtræq. partes sunt, ergo & lunulæ eis pares dissectæ sunt: Idem de tertia parte dicendum.

Eadem

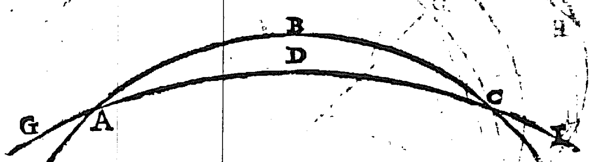
Eadem in parua lunula operaberis, nam si bifariam ABC lunulam vis partiri trianguli eius ABS latus, AS bifariam in D, & latus à D quousque ad punctum C perueniat protrahe-



mus, & lineam à B medio semicirculi, punctoq. S, vsque ad circuli A T C F L centrum perueniat, & vbi se intersecabunt puncto E siste circini pedem, & Interuallo EA, extende circulũ AIC, & diuisa erit lunula: probatio ex anteriori liquet.

Datam quamcumque lunulam quadrare. Prop. 10.

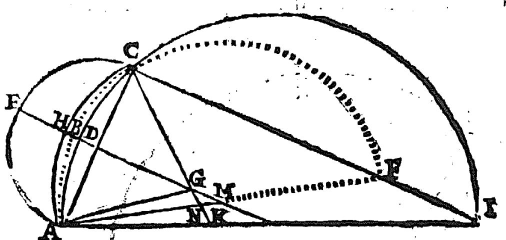
Esto exposita quadranda lunula A B C D cuiuscunque ordinis, cui æquale oportet reperiri rectilineũ, maior cir-



culus GADCH, integer circinetur, & sit ADCI porrecto suo diametro A I, & à puncto A superponatur præfata lunula ABC, & compleatur circulus A B C F cum suo diametro AF, extendaturq. linea à puncto A ad C, & sit AC, discindaturq. rectus angulus ACI per rectam C K, & super basim AC circinetur semicirculus AEC, & puncto G, basi AC, fiat quadrans

L dupli,

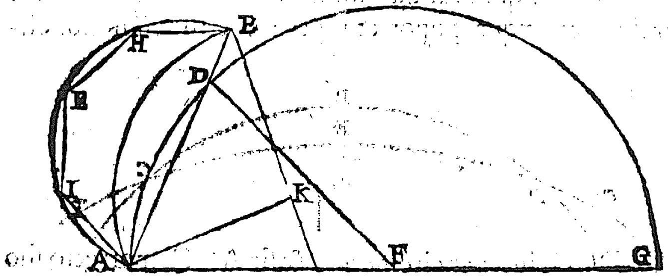
dupli,& ſit AHCG, & trahatur A G, G C. Quoniam triangulum A C G eſt æquale lunulæ ACEH, remanet ſubtriangulum AGK æquale ſub lunulæ AHCD. à puncto ſemicirculi medio E, AEC per G, vſque ad



centrum circuli A D C I, dirigatur linea EHBDGML ex circumferentia A B C, reperiatur centrum, & ſit M, & trahatur A M, vſque ad F diametri finem ex ſupradictis, ſi à triangulo AGK, quod lunulam AHCD refert, ſubducatur AGM, quod repręſentat lunulam A H C B, remanet ſubtriangulum ANK repręſentans ſublunulam ABCD, quod erat edocendum.

Semilunulas ex nota ratione quadrare.

Prop. VI.



IN ſola proportione dupli, & ſubdupli accidit, vt ſemidiameter circuli ſubdupli ſit æqualis ſubtenſæ quadrantis dupli, vt in prima Prop. huius vidimus: ideo in his perfectæ lunulæ, & alijs potius circuli ſemilunulæ dici poſſunt.

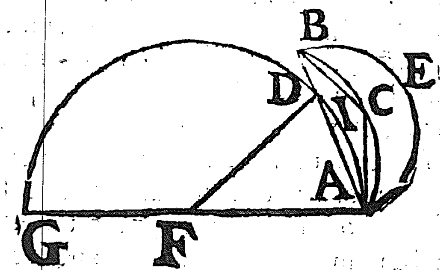
Eſto

Eſto circulus ADG quadrans ſemicirculi AEB, & quarta pars ſemicirculi A D G ſit A D F, & diameter ſubdupli ADB tranſeat per punctum D, dico triquetrum A D F ſemicirculo AEDB æquale eſſe. Tollatur communis portio DA, remanet lunula AEBD, æqualis triangulo FDA, ſed AEBL perfecta lunula nota eſt: ergo ſublunula A L B D nota erit, ſubducito triangulum D B K ab A K F, reſiduum ſublunulæ A L D B notum erit.

Poteſt & alio modo cognoſci. Portio quadrupli AD valet quatuor portiones ſubquadrupli, ſecetur circumferentia AEB quadrifariam, & ſint portiones AI, IE, EH, HB, amputentur portiones AI, IE, EH, HB, reponatur AB, trapezium rectilineum AIEHBD notum erit, & ſic de cæteris.

Alio modo.

SIt ſemicirculus A-D G, quadruplus ipſius A E B, & ipſius AEB, capiatur duplus, & ſit circumferentia ACB, remaneat infra ſublunula A C B D I A, quam volumus quadrare. Quia ſemilunula ACBDIA, nota eſt, &

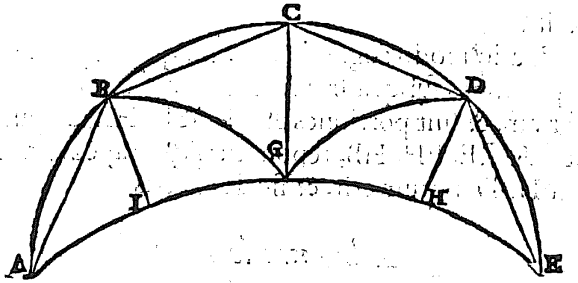


nota etiam lunula AEBC, ex vigeſima ſexta primi noſtri, ſi notum à noto ſubtrahatur, quod reliquum eſt notum erit.

Poſſumus etiam proximè prædicto modo quadrare, quia portio A D, eſt dupla ipſius A C B, diuidatur A C B, in duas partes AC, CB, demantur hæ duæ portiones AC, CB, reponatur A D, rectilineum A C B D A, eſt æqualæ ſublunulæ A C B D I A.

Lunulam per latum in quadrabiles partes diuidere. Prop. 12.

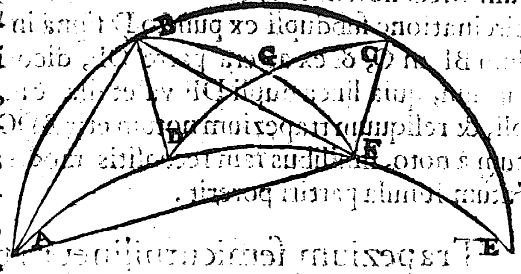
NNunc me conuertam ad quadrandas lunularum in latum partes, cum paulò ante per longum indicauerimus.



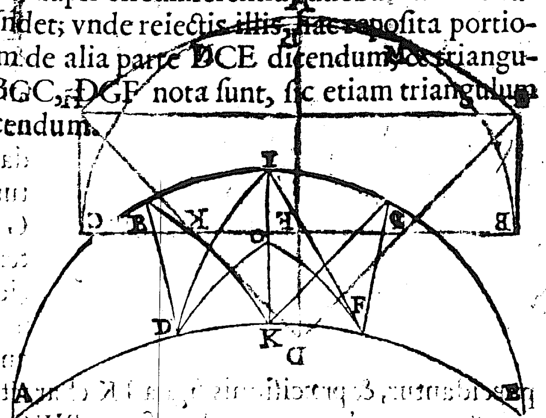
Esto lunula AECG, diuidaturq. per medium per lineam CG, & AC circumferentiam per medium profcindes in B, & ex aduersa parte CE in D, & inuariata circini apertura semicirculi subdupli pes vagus in A, alter fixus sistatur taliter, vt ex B voluatur in G, & sit circumferentiæ circumductio B G, eodemq. ductu definiatur intercapedo G D similis BG, mox profluat recta ad partitiones AB, BC, CD, AG, GE, & à puncto I, medio circumferentiæ AG, erige lineam sursum ad circumferentiam vsque donec eam in B tetigerit. Quoniam A B est æqualis B G, & portio A G dupli rependit duas AB, BG semidupli, dico illis AB, BG sublatis, hac AG reposita, rectilineum triangulum A B G notum erit, idem intelligendum de altera partitione G D E, reliquum triangulum BCDG notum erit, vt residuum notæ lunulæ. Vel amputatis portionibus BC, CD, repositis his BG, GD æquales, & eiusdem circumferentiæ, recensitum triangulum notum erit. Ex his triangula ABG, BCDG, GDE per medium transuersis diuisa lineis nota erunt, & tripartita erit lunula.

Vel

Vel circuli dupli tripartita partitione curuaturā constituas A D, DF, FE; Item subdupli AB, BC, CE; inuariataq. circini apertura intra duo puncta B F, DC mutuo inter se intercidentes arcus flectantur BF, DC, & vbi futurus est cōtactus illic pone G, aio triangulum ABF notum esse, quia AF, dupli circumferentia duobus illis subdupli AB, BF respondet; vnde reiectis illis, hac reposita portione pensatur. Idem de alia parte DCE dicendum. & triangula BGD, CGF, BGC, DGF nota sunt, sic etiam triangulum BCF, & FCE dicendum.

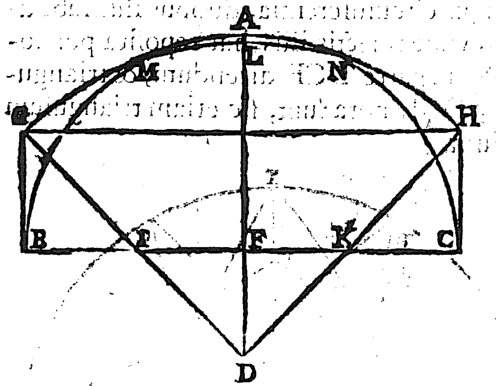


Remanente adhuc lunulę illæsa tripartitione ex puncto D fixo circini pede altero ad F signa in subduplo æqualē portionē in I, mox inuariata circini apertura, qua duplū circulū constituisti, siste circini pedem in altera extremitate lunulæ puta E, alterum ad D, & I conuertè, & signa circumferentiam dupli DI, & ab I ad F excurrat recta I F, dico triangulum DIF notum, quia circumferentia dupli DF est æqualis DI ex constitutione, ratione iam sæpius repetita, addendo, & demendo notum erit triangulum DIF, vel intercapedine BK circineur BK circumferentia dupli, & recta ducatur K C, quia D F est compar BC, & DF æqualis ipsi BK, tolle portionem BC, repone BK triangulum



lum BKC notum erit, vel deducta linea IK, & interuallo B I circinatione subdupli ex puncto D signa in linea IK interuallum BI in O, & ex altera parte OF, dico triangulum DOF notum, quia linea dupli DF valet illas duas DO, OF subdupli, & reliquum trapezium notum erit BDOFC demendo notum à noto, similibus iam recensitis modis multipliciter perlatum lunula partiri poterit.

Trapezium semicuruilineum trapezio par extruere. Prop. 13.



ESto dupli quadrans DGLH, & hinc inde à terminis G H transuersa linea ducenda est, quæ curuaturam spectet, & fit G H, mox duo latera, quæ anguli faciem in D confirmant DG, DH, amussim in medio præcidantur, & præcisionis signa I K characteribus insigniantur, & proruat linea per eadem signa BIKC ipsi GH parallela, & ex punctis G H ad perpendiculum demittantur supra BC lineæ GB, GH, & excurrentes in longum lineam BIKC bifariam diuidat, cuius diuisionis terminus F, & centro F interuallo FB, circumducatur semicirculi forma subdupli BAC, quæ quadrantis circumferentiam in duobus punctis intercidet. Intercisionis puncta totidem literas sortiantur M, N, & vniatur FD. Dico Trapezium semicuruilineum BGMLNHC par esse quadranti DGLH, sed ad demonstrationem accingamur. Quoniam FD æquidistat HC, cadit inter

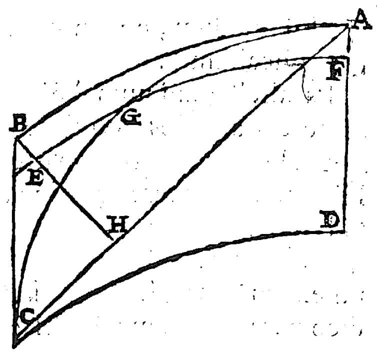
inter

inter eas DH, ergo anguli FDK, KBC æquales anguli ad K contrapositi etiam pares. Itidem & recti ad F, C, & HK linea ipsi KD etiam æqualis. Triangulum ergo FDK triangulo KHC compar. Idem ex contraria parte sentiendum, cum compari linearum descriptione confirmata sit. Demantur ergo triangula IFD, FDK reponantur GBI, KHC, trapezium semicuruilineum B G M L N H C æquipollet semicirculo BMANC.

Consectarium.

EX his apparet lunulam MANL æqualem esse duobus triangulis MGB, NHC, quoniam circuli pars extramittitur MANL, includantur trapezij partes NHC, MGH.

Triangulum semicuruilieum ex quarta semicirculi subdupli, & octaua dupli quadrare. Prop. 14.



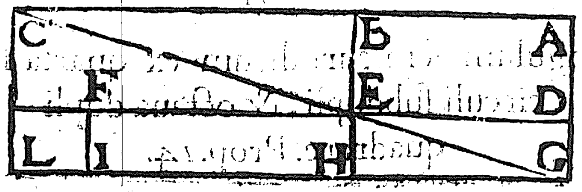
SIt semiabscissa lunula AGCD, & linea CB ipsi AD parallela constituatur, & dupli circumferentia AB extremitate A ipsi CD parallela ducatur, donec ductum lineæ CB contingat in B, dico semicuruilineum triangulum AB-CG quadrari posse. Quoniam AB ipsi CD Parallela, & eiusdem circumferetiæ, ergo quadrangulum BACD notum est, à quo si semilunula subducatur CGAD, remanet triangulum notum ABCG.

Vel

Vel quia lunula æqualis est AGF ipsi ECG ex præcedenti, parallelogrammum EBAF est notum, quia ex æqualibus circumferentijs; ergo & triangulum CBA notum est, quia vtrique additur commune GAF.

Vel triangulum semicuruilineum, quod paulò ante descripsimus ABCE remaneat, & ducatur linea CA portio semidupli CGA, & fit ABH semiportio dupli, ergo æquales, abscessus communis EHGA tollatur, remanet BEA æquale CEH, addatur vtrique communis B E C, ergo triangulum rectilineum BHC est æquale triangulo semicuruilineo BCGA.

Notum à noto subtrahere. Prop. 15.

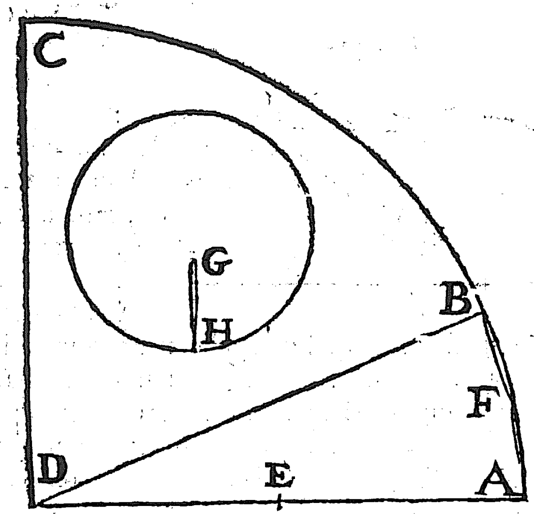


Sed modum, quo notum à noto subtrahatur nunc explicabimus.

Parallelogrammum ABDE circa decussatas lineas BH, EF ad rectos angulos constitue, & sit quantitas lunulæ datæ B A E D, ex alia crucis parte H I E F, elongeturq. parallela IH, quousque coëat cum linea AD in puncto G, mox linea G E discindens angulum D G H, ducatur per coniunctum E, quousque intercidat lineam AB, & ibi appone C, & ab C, parallela ducatur CL, vsque donec lineam GHI tetigerit in L, dico parallelogrammũ FLI esse quantitatem trianguli BAC, qua superatur à parallelogrammo FH, quoniam parallelogrammum BD est æquale parallelogrammo EL, dempto parallelogrammo FH, residuum erit FL, quod quærimus.

Circu-

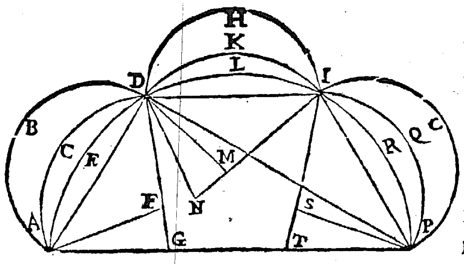
Circulum quadrato proximum constituere. Prop. 16.



Absoluta lunularum tractatione venio tandem ad circuli quadrationem ex ingenij facultate, sed initio circuli quadrationi approximabimur. Esto sexto decupli circuli quadrans A B C, & ex semidiametri dimidio D E, sub sexto decuplus circulus constituatur GH, amputetur pars quadrantis ADC, sitq. DBA, dico triangulum DBA circulo mutua parilitate constare secetur arcus quadrantis BA bifariam in F, connectanturq. rectè BF, FA, & à circulo G H itidem duæ illæ portiones quadrantis BF, FA, dico triangula FDB, ADF esse æqualia circulo, demptis duobus portionibus GH, æquales illis BF, FA interclusis : quod patet ex constructione.

 Da-

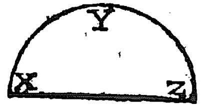
Datum circulum quadrare. Prop. 17.

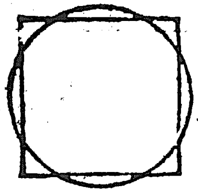


ESto expoſitus circulus A D I P, inuariataq. circini apertura ſignẽtur in circuli circumferentia tres abſceſſus tres. n. recipiet compares, & coæquales ſibi correſpondentes ſemidiametro ſemicirculos (cogẽte ad id Euclidis Propoſ. 15. 4.) quibus applicentur diametri AD, DI, IP, ſupra quorum centra incuruentur ſemicirculi ABD, DHI, IOP, excurrat linea ex D ad P, diuidaturq. angulus A D P per lineam DFG, & ex arte ſuperius repetita fiant lunulæ ABDC, DHIK, IOPQ, & triangula A D F, D M I, I S P cum ſuis ſub triangulis ſuis ſublunulis correſpondentibus A F G, D N M, P S T.

Quoniam ſemicirculus A L P conſtat quatuor ſemicirculis æqualibus ſemidiametro, ſi tollantur tres portiones communes A E D, D L I, I R P, & tria triangula æqualia lunulis AFD, DMI, ISP, tollanturq. tres ſublunulæ tribus ſubtriangulis reſpondentes ACDE, DKIL, IQPR, cum ſuis ſubtriangulis reſpondentibus illis AFG, NDM, SPT, vacuum reliquum intercedens rectilineum, vel trapezium G D N M I S T valet quantum ſemicirculus quartus relictus X Y Z, hoc inane valet ſemicirculus X Y Z. Abſoluamus igitur circulum cum ſuo quadrato valente trapezium illud, & quadratus erit circulus.

Nunc



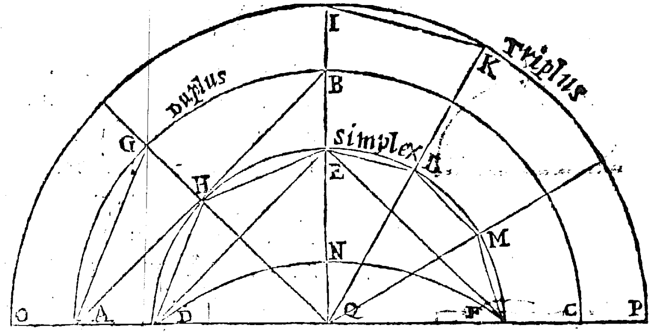


Nunc euertatur, & faceſſat Hyppocratis Chij fallacia circulum quadrare satagentis, quod putarat quemadmodum lunulæ dupli, & ſubdupli in quadratum adducebantur, ita quamcumq. circulorum cum ſuis rectilineis æquationem; ſed eius corruit demonſtratio, nam res ſe aliter habet: quod enim eſt ſingulare in circulis ſe in dupla proportione exc reſcentibus, diſſentaneum eſt idem in reliquis exiſtimare. Nos (ni fallimur) ex inuentione trianguli A F G ſublunulæ aereæ A D C E reſpondentis, aſſecuti ſumus.

Data portione nota, alteram cuiuſq. proportionis ſibi comparem peruestigare. Prop. 18.

ESto linea O P futura baſis variorum circulorum, & ſemicirculus O I P triplus, A B C duplus, & D E F ſimplex, ſiue ſubduplus, & ſic de alijs alter ſupra alterum in quæſita ratione ſemper excreſcens, & à puncto Q, quod medium diametri poſſidet angulis vtrinque æqualibus aſcendat linea Q I ſemicirculus bifaria diuiſione diſcendens: mox ex centro Q circumferentiam AB æqualiter partiens vſque ad G, tranſmittatur, ex altera parte duæ aliæ circumferentiã I P, trifariam ſecantes coæquentur, & ſint Q K, Q M, & ſit

M 2 data

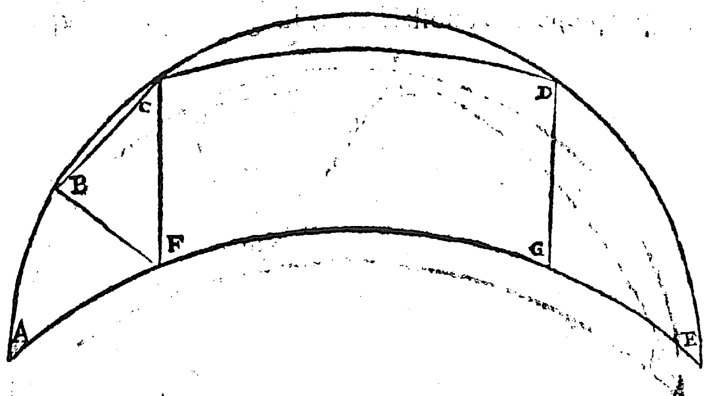


data simplicis circuli portio DE, alteram volumus in dupla proportione æqualem inuenire. Dupli quarta A G B discindatur bifariam, trahaturq. linea AG, & à puncto D ad E dupli portio subpingatur. Quoniam vidimus in lunula DEFN, portionem dupli quartæ circuli DNF valere duas quartas circuli subdupli, vel simplicis D H E, E L F, sed portio dupli D N F est æqualis A G B, quia eadem est dupli quarta. Ergo area conclusa in portione dupli DNF valet duas quartas subdupli DHE, ELF, & portio octaua dupli AG valet duas octauas subdupli D H, H E. Idem dicendum de tripla, nam circulus O I K P est triplus subtripli, vel simplicis circuli DHELF, & par sexta semicirculi tripli I K, valet tres sextas subtripli circuli EL, LM, MF, & sic de alijs cuiuscunque quantitatis, & incognitæ mensuræ dicendum: nam semper rata, & iusta proportio erit.

Ex portionibus circulum quadrare. Prop. 19.

EX ea, quam modo exposuimus propositione dependet hæc portionum quadratio, quam ob oculos exponemus.

Esto proposita lunula A B C D E, ex qua (docente id 15. propos. nostri ante præteritam) minor lunula abscindatur, quæ

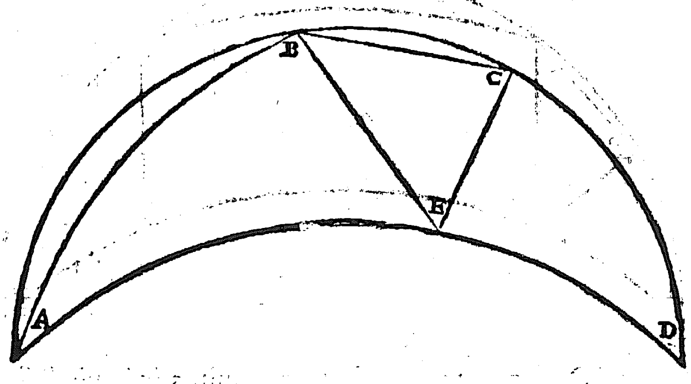


quæ sit CD, ab cuius extremitatum terminis infernè descendant perpendiculares CF, DG. Quoniam quadrangulum semicuruilineum C F D G notum est ex eisdem æqualibus circumferentijs dupli CD, GF, nota quoque est minor lunula CD, si à lunula ACDE subducatur quadrangulum notum CDGF, & lunula CD residua cornicula ACF, DGE nota erunt. Mox lineæ dupli AF subdupli compar AB reperiatur (per propositionem proximè præteritam) & erit trilaterum BFC, quod subtrahes à corniculo ABCF, & erit triangulum B C F notum. Duc lineam B C, & trilaterum rectilineum B C F notum subtrahe à semicuruilineo B C D noto, & area intra portionem BC concepta nota resultabit.

Altera.

ALiam figuram extruendam non putamus, sed superiore lunula relicta. Esto à puncto A vsque ad B duo puncta, dupli circumferentia flectatur, & sit lunula minor AB, & æqualis A B, fiat linea A E dupli, & à puncto B ad E rectus tra-

trames ducatur. mox lineæ ED compar ſubdupli reperiatur CD, (per propoſit. 2. noſtri huius) iunganturq. lineæ E C, &



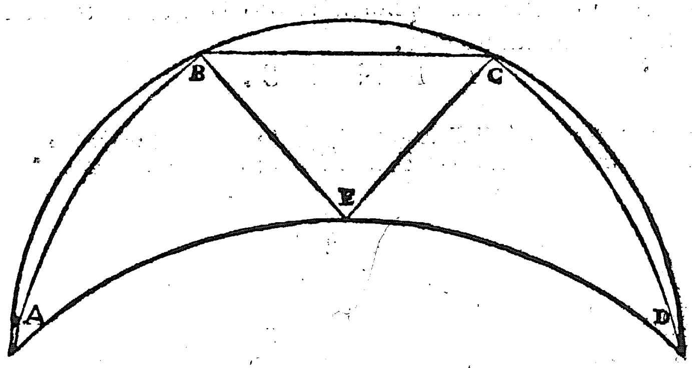
B C, recta lineam etiam connectatur. Quoniam A B, A E æquales, & eædem circumferentiæ ſunt, ſi lineæ ſubtendantur arcubus A B, A E amputata portione A B, repoſita ſuo loco A E notum erit triangulum ſemicuruilineum ABE, lunula AB nota eſt (ex propoſ. 15. præſentis noſtri) ergo lunulæ pars A B E nota erit, deme A B integram, innoteſcet reſiduum BCDE lineæ ED comparem reddidimus CD. Ergo corniculus ECD notus erit, deme à toto reſiduo BCDE innoteſcet trimetrum ſemicuruilineum BEC, appinge lineam BC à terminis BC, & triangulum rectilineum B C E notum erit, ſubducito à curuilineo, & portio BC nota erit.

Altera.

VEl in lunula ABCDE à puncto A vſque ad E, nota in ſubduplo, & ſit AB, & ex altera parte CD, & à puncto A, vſque ad B appinge lineam dupli AB, & ex altera parte CD, mox connecte lineas rectas B E, E C, B C, quia A B, A E æquales ſunt, ſic C D, D E, ergo lunulæ A B, C D etiam notæ, tolle, quia remanet par medij BEC nota, à noto

to

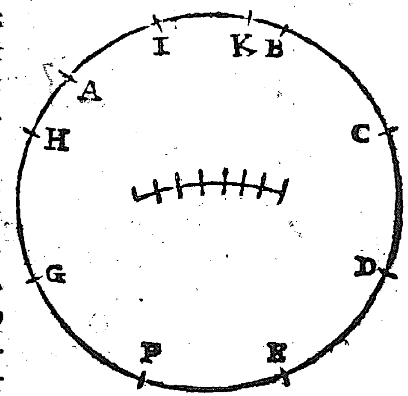
to ſemicuruilineo BCE, tolle rectilineum BCE, remanet nota portio BC, ſic & aliæ diuiſiones imaginari poſſunt, & portiones quadrari.



Data vna portione nota, totam circumferentiam circuli quadrare.

Prop. 20.

SIt propoſitus circulus ABCDEFGH, & ſit portio nota AB, nos hanc circumferentiam metiemur ſepties AB, BC, CD, DE, EF, FG, GH, ſupererit H A, qua metiemur bis AB ideſt AI, IK, & ſupererit K B, quæ portionem I K ter menſurabit. Ergo AB ſepties partiemur, quibus abſciſſionibus ſuas partes addemmus. A portione igitur A B ſubducemus octogonum



num

num rectilineum, reliquum in septem portiones diuidemus, ex quibus portiones tres recipiemus pro HI, & sic tota circumferentia quadrata erit.

FINIS.

Errata.

pag.	vers.	err.	corr.
11	21	AC	DE
13	8	CGHE	CGHF
20	9	D, & ex D	L, & ex L
23	1	vtrunque	vtcunque
23	18	AEG	AFC
23	21	FG	FB
30	1	AD	AB
32	5	hit	hic
48	15	Prop. 8.	Prop. 7.
49	17	repesitisq.	repositisq.
58	7	MNE	MNP
64	20	trapesium	trapezium
65	8	dupl s	duplicis
68	15	æquidistant	æquidistans
69	1	dimidium	quarta pars.
70	12	descriptum	descriptas.
71	15	dempla	dempta
87	13	Semicuruilieum	Semicuruilineum

ROMAE,
Apud Bartholomæum Zannettum. M. DC. X.

SVPERIORVM PERMISSV.

Typographus amico Lectori.

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