

so the (square) on the first (is) to the (square) on the second [Def. 5.9, Prop. 6.20 corr.]. Thus, as DB is to BA , so the (square) on DB (is) to the (square) on BF . Thus, inversely, as AB (is) to BD , so the (square) on FB (is) to the (square) on BD . And AB (is) triple BD . Thus, the (square) on FB (is) three times the (square) on BD . And the (square) on AD is also four times the (square) on DB . For AD (is) double DB . Thus, the (square) on AD (is) greater than the (square) on FB . Thus, AD (is) greater than FB . Thus, AL is much greater than FB . And KL is the greater piece of AL , which is cut in extreme and mean ratio—inasmuch as LK is (the side) of the hexagon, and KA (the side) of the decagon [Prop. 13.9]. And NB is the greater piece of FB , which is cut in extreme and mean ratio. Thus, KL (is) greater than NB . And KL (is) equal to LM . Thus, LM (is) greater than NB [and MB is greater than LM]. Thus, MB , which is (the side) of the icosahedron, is much greater than NB , which is (the side) of the dodecahedron. (Which is) the very thing it was required to show.

† If the radius of the given sphere is unity then the sides of the pyramid (i.e., tetrahedron), octahedron, cube, icosahedron, and dodecahedron, respectively, satisfy the following inequality: $\sqrt{8/3} > \sqrt{2} > \sqrt{4/3} > (1/\sqrt{5}) \sqrt{10 - 2\sqrt{5}} > (1/3) (\sqrt{15} - \sqrt{3})$.

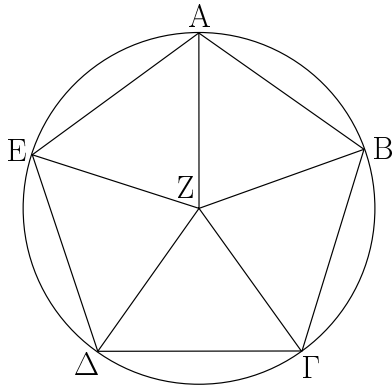
Λέγω δὴ, ὅτι παρὰ τὰ εἰρημένα πέντε σχήματα οὐ συσταθήσεται ἕτερον σχῆμα περιεχόμενον ὑπὸ ἰσοπλευρῶν τε καὶ ἰσογωνίων ἴσων ἀλλήλοις.

Ὑπὸ μὲν γὰρ δύο τριγώνων ἢ ὅλως ἐπιπέδων στερεὰ γωνία οὐ συνίσταται. ὑπὸ δὲ τριῶν τριγώνων ἢ τῆς πυραμίδος, ὑπὸ δὲ τεσσάρων ἢ τοῦ ὀκταέδρου, ὑπὸ δὲ πέντε ἢ τοῦ εἰκοσαέδρου· ὑπὸ δὲ ἑξ τριγώνων ἰσοπλευρῶν τε καὶ ἰσογωνίων πρὸς ἐνὶ σημείῳ συνισταμένων οὐκ ἔσται στερεὰ γωνία· οὕσης γὰρ τῆς τοῦ ἰσοπλευροῦ τριγώνου γωνίας διμοίρου ὀρθῆς ἔσονται αἱ ἑξ τέσσαρσιν ὀρθαῖς ἴσαι· ὅπερ ἀδύνατον· ἅπαντα γὰρ στερεὰ γωνία ὑπὸ ἐλασσόνων ἢ τεσσάρων ὀρθῶν περέχεται. διὰ τὰ αὐτὰ δὲ οὐδὲ ὑπὸ πλειόνων ἢ ἑξ γωνιῶν ἐπιπέδων στερεὰ γωνία συνίσταται. ὑπὸ δὲ τετραγώνων τριῶν ἢ τοῦ κύβου γωνία περιέχεται· ὑπὸ δὲ τεσσάρων ἀδύνατον· ἔσονται γὰρ πάλιν τέσσαρες ὀρθαί. ὑπὸ δὲ πενταγώνων ἰσοπλευρῶν καὶ ἰσογωνίων, ὑπὸ μὲν τριῶν ἢ τοῦ δωδεκαέδρου· ὑπὸ δὲ τεσσάρων ἀδύνατον· οὕσης γὰρ τῆς τοῦ πενταγώνου ἰσοπλευροῦ γωνίας ὀρθῆς καὶ πέμπτου, ἔσονται αἱ τέσσαρες γωναὶ τεσσάρων ὀρθῶν μείζους· ὅπερ ἀδύνατον. οὐδὲ μὴν ὑπὸ πολυγώνων ἐτέρων σχημάτων περισχεθήσεται στερεὰ γωνία διὰ τὸ αὐτὸ ἄτοπον.

Οὐκ ἄρα παρὰ τὰ εἰρημένα πέντε σχήματα ἕτερον σχῆμα στερεὸν συσταθήσεται ὑπὸ ἰσοπλευρῶν τε καὶ ἰσογωνίων περιεχόμενον· ὅπερ ἔδει δεῖξαι.

So, I say that, beside the five aforementioned figures, no other (solid) figure can be constructed (which is) contained by equilateral and equiangular (planes), equal to one another.

For a solid angle cannot be constructed from two triangles, or indeed (two) planes (of any sort) [Def. 11.11]. And (the solid angle) of the pyramid (is constructed) from three (equiangular) triangles, and (that) of the octahedron from four (triangles), and (that) of the icosahedron from (five) triangles. And a solid angle cannot be (made) from six equilateral and equiangular triangles set up together at one point. For, since the angles of a equilateral triangle are (each) two-thirds of a right-angle, the (sum of the) six (plane) angles (containing the solid angle) will be four right-angles. The very thing (is) impossible. For every solid angle is contained by (plane angles whose sum is) less than four right-angles [Prop. 11.21]. So, for the same (reasons), a solid angle cannot be constructed from more than six plane angles (equal to two-thirds of a right-angle) either. And the (solid) angle of a cube is contained by three squares. And (a solid angle contained) by four (squares is) impossible. For, again, the (sum of the plane angles containing the solid angle) will be four right-angles. And (the solid angle) of a dodecahedron (is contained) by three equilateral and equiangular pentagons. And (a solid angle contained) by four



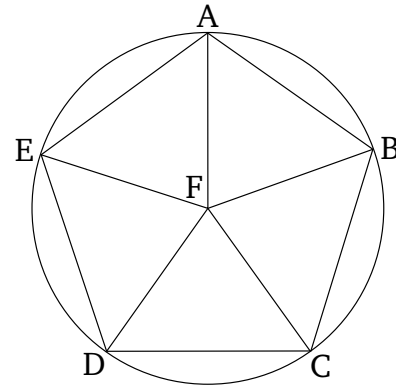
Λήμμα.

Ὅτι δὲ ἡ τοῦ ἰσοπλεύρου καὶ ἰσογωνίου πενταγώνου γωνία ὀρθή ἐστι καὶ πέμπτου, οὕτω δεικτέον.

Ἐστω γὰρ πεντάγωνον ἰσόπλευρον καὶ ἰσογώνιον τὸ ΑΒΓΔΕ, καὶ περιγεγράφθω περὶ αὐτὸ κύκλος ὁ ΑΒΓΔΕ, καὶ εἰληφθῇ αὐτοῦ τὸ κέντρον τὸ Ζ, καὶ ἐπεζεύχθωσαν αἱ ΖΑ, ΖΒ, ΖΓ, ΖΔ, ΖΕ. δῖχα ἄρα τέμνουσι τὰς πρὸς τοῖς Α, Β, Γ, Δ, Ε τοῦ πενταγώνου γωνίας. καὶ ἐπεὶ αἱ πρὸς τῷ Ζ πέντε γωνίαι τέσσαρσιν ὀρθαῖς ἴσαι εἰσὶ καὶ εἰσιν ἴσαι, μία ἄρα αὐτῶν, ὡς ἡ ὑπὸ ΑΖΒ, μιᾶς ὀρθῆς ἐστι παρὰ πέμπτου· λοιπαὶ ἄρα αἱ ὑπὸ ΖΑΒ, ΑΒΖ μιᾶς εἰσιν ὀρθῆς καὶ πέμπτου. ἴση δὲ ἡ ὑπὸ ΖΑΒ τῇ ὑπὸ ΖΒΓ· καὶ ὅλη ἄρα ἡ ὑπὸ ΑΒΓ τοῦ πενταγώνου γωνία μιᾶς ἐστὶν ὀρθῆς καὶ πέμπτου· ὅπερ ἔδει δεῖξαι.

(equiangular pentagons is) impossible. For, the angle of an equilateral pentagon being one and one-fifth of right-angle, four (such) angles will be greater (in sum) than four right-angles. The very thing (is) impossible. And, on account of the same absurdity, a solid angle cannot be constructed from any other (equiangular) polygonal figures either.

Thus, beside the five aforementioned figures, no other solid figure can be constructed (which is) contained by equilateral and equiangular (planes). (Which is) the very thing it was required to show.



Lemma

It can be shown that the angle of an equilateral and equiangular pentagon is one and one-fifth of a right-angle, as follows.

For let $ABCDE$ be an equilateral and equiangular pentagon, and let the circle $ABCDE$ have been circumscribed about it [Prop. 4.14]. And let its center, F , have been found [Prop. 3.1]. And let FA , FB , FC , FD , and FE have been joined. Thus, they cut the angles of the pentagon in half at (points) A , B , C , D , and E [Prop. 1.4]. And since the five angles at F are equal (in sum) to four right-angles, and are also equal (to one another), (any) one of them, like AFB , is thus one less a fifth of a right-angle. Thus, the (sum of the) remaining (angles in triangle ABF), FAB and ABF , is one plus a fifth of a right-angle [Prop. 1.32]. And FAB (is) equal to FBC . Thus, the whole angle, ABC , of the pentagon is also one and one-fifth of a right-angle. (Which is) the very thing it was required to show.

GREEK-ENGLISH LEXICON

ABBREVIATIONS: *act* - active; *adj* - adjective; *adv* - adverb; *conj* - conjunction; *fut* - future; *gen* - genitive; *imperat* - imperative; *impf* - imperfect; *ind* - indeclinable; *indic* - indicative; *intr* - intransitive; *mid* - middle; *neut* - neuter; *no* - noun; *par* - particle; *part* - participle; *pass* - passive; *perf* - perfect; *pre* - preposition; *pres* - present; *pro* - pronoun; *sg* - singular; *tr* - transitive; *vb* - verb.

ἄγω, ἄξω, ἡγαγον, -ῆχα, ἡγμαι, ἡχθην : *vb*, lead, draw (a line).

ἄδύνατος -ον : *adj*, impossible.

ἀεί : *adv*, always, for ever.

αἰρέω, αἰρήσω, εἰ[λ]λον, ἥρηκα, ἥρημαι, ἥρέθην : *vb*, grasp.

αἰτέω, αἰτήσω, ἡτησα, ἡτηκα, ἡτημαι, ἡτήθη : *vb*, postulate.

αἵτημα -ατος, τό : *no*, postulate.

ἀκόλουθος -ον : *adj*, analogous, consequent on, in conformity with.

ἄκρος -α -ον : *adj*, outermost, end, extreme.

ἄλλά : *conj*, but, otherwise.

ἄλογος -ον : *adj*, irrational.

ἅμα : *adv*, at once, at the same time, together.

ἄμβλυγώνιος -ον : *adj*, obtuse-angled; τὸ ἄμβλυγώνιον, *no*, obtuse angle.

ἄμβλύς -εῖα -ύ : *adj*, obtuse.

ἄμφοτερος -α -ον : *pro*, both.

ἀναγράφω : *vb*, describe (a figure); see γράφω.

ἀναλογία, ἡ : *no*, proportion, (geometric) progression.

ἀνάλογος -ον : *adj*, proportional.

ἀνάπαλιν : *adv*, inverse(ly).

αναπληρόω : *vb*, fill up.

ἀναστρέφω : *vb*, turn upside down, convert (ratio); see στρέφω.

ἀνατροφή, ἡ : *no*, turning upside down, conversion (of ratio).

ἀνθυφαίρεω : *vb*, take away in turn; see αἰρέω.

ἀνίστημι : *vb*, set up; see ἵστημι.

ἄνιστος -ον : *adj*, unequal, uneven.

ἀντιπάσχω : *vb*, be reciprocally proportional; see πάσχω.

ἄξων -ονος, ὁ : *vb*, axis.

ἅπαξ : *adv*, once.

ἅπας, ἅπασα, ἅπαν : *adj*, quite all, the whole.

ἄπειρος -ον : *adj*, infinite.

ἄπεναντίον : *ind*, opposite.

ἀπέχω : *vb*, be far from, be away from; see ἔχω.

ἀπλάτης -ές : *adj*, without breadth.

ἀπόδειξις -εως, ἡ : *no*, proof.

ἀποκαθίστημι : *vb*, re-establish, restore; see ἵστημι.

ἀπολαμβάνω : *vb*, take from, subtract from, cut off from; see λαμβάνω.

ἀποτέμνω : *vb*, cut off, subtend.

ἀπότμημα -ατος, τό : *no*, piece cut off, segment.

ἀποτομή, ἡ : *vb*, piece cut off, apotome.

ἄπτω, ἄψω, ἥψα, —, ἥμμαι, — : *vb*, touch, join, meet.

ἄπώτερος -α -ον : *adj*, further off.

ἄρα : *par*, thus, as it seems (inferential).

ἀριθμός, ὁ : *no*, number.

ἄρτιάκις : *adv*, an even number of times.

ἄρτιόπλευρος -ον : *adj*, having a even number of sides.

ἄρχω, ἄρξω, ἡρξα, ἡρχα, ἡργμαι, ἡρχθην : *vb*, rule; *mid.*, begin.

ἄσύμμετρος -ον : *adj*, incommensurable.

ἄσύμππτωτος -ον : *adj*, not touching, not meeting.

ἄρτιος -α -ον : *adj*, even, perfect.

ἄτμητος -ον : *adj*, uncut.

ἄτόπος -ον : *adj*, absurd, paradoxical.

αὐτόθεν : *adv*, immediately, obviously.

ἀφαίρεω : *vb*, take from, subtract from, cut off from; see αἰρέω.

ἄφή, ἡ : *no*, point of contact.

βάθος -εος, τό : *no*, depth, height.

βαίνω, -βήσομαι, -έβην, βέβηκα, —, — : *vb*, walk; *perf*, stand (of angle).

βάλλω, βαλῶ, ἔβαλον, βέβηκα, βέβημαι, ἐβλήθην : *vb*, throw.

βάσις -εως, ἡ : *no*, base (of a triangle).

γάρ : *conj*, for (explanatory).

γί[γ]νομαι, γενήσομαι, ἐγενόμην, γέγονα, γεγένημαι, — : *vb*, happen, become.

γνώμων -ονος, ἡ : *no*, gnomon.

γραμμή, ἡ : *no*, line.

γράφω, γράψω, ἔγραψα, γέγραφα, γέγραμμαι, ἐραψάμην : *vb*, draw (a figure).

γωνία, ἡ : *no*, angle.

δεῖ : *vb*, be necessary; δεῖ, it is necessary; ἔδει, it was necessary; δεόν, being necessary.

δείκνυμι, δείξω, ἔδειξα, δέδειχα, δέδειμαι, ἐδείχθην : *vb*, show, demonstrate.

δεικτέον : *ind*, one must show.

δείξις -εως, ἡ : *no*, proof.

δεκαγώνος -ον : *adj*, ten-sided; τὸ δεκαγώνον, *no*, decagon.

δέχομαι, δέξομαι, ἐδεξάμην, —, δέδεμαι, ἐδέχθην : *vb*, receive, accept.

δή : *conj*, so (explanatory).

δηλὰδὴ : *ind*, quite clear, manifest.

δηλος -η -ον : *adj*, clear.

δηλονότι : *adv*, manifestly.

διάγω : *vb*, carry over, draw through, draw across; see ἄγω.

διαγώνιος -ον : *adj*, diagonal.

διαλείπω : *vb*, leave an interval between.

διάμετρος -ον : *adj*, diametrical; ἡ διάμετρος, *no*, diameter, diagonal.

διαίρεσις -εως, ἡ : *no*, division, separation.

- διαιρέω : *vb*, divide (in two); διαρεθέντος -η -ον, *adj*, separated (ratio); see αἶρεω.
 διάστημα -ατος, τό : *no*, radius.
 διαφέρω : *vb*, differ; see φέρω.
 δίδωμι, δώσω, ἔδωκα, δέδωκα, δέδομαι, ἐδόθη : *vb*, give.
 διμοῖρος -ον : *adj*, two-thirds.
 διπλασιάζω : *vb*, double.
 διπλάσιος -α -ον : *adj*, double, twofold.
 διπλασίων -ον : *adj*, double, twofold.
 διπλοῦς -ῆ -οῦν : *adj*, double.
 δίς : *adv*, twice.
 δίχα : *adv*, in two, in half.
 διχορομία, ἡ : *no*, point of bisection.
 δυάς -άδος, ἡ : *no*, the number two, dyad.
 δύναμαι : *vb*, be able, be capable, generate, square, be when squared; δυναμένη, ἡ, *no*, square-root (of area)—i.e., straight-line whose square is equal to a given area.
 δύναμις -εως, ἡ : *no*, power (usually 2nd power when used in mathematical sense, hence), square.
 δυνατός -ή -όν : *adj*, possible.
 δωδεκάεδρος -ον : *adj*, twelve-sided.
 ἐαυτοῦ -ῆς -οῦ : *adj*, of him/her/it/self, his/her/its/own.
 ἐγγίω -ον : *adj*, nearer, nearest.
 ἐγγράφω : *vb*, inscribe; see γράφω.
 εἶδος -εος, τό : *no*, figure, form, shape.
 εἰκοσάεδρος -ον : *adj*, twenty-sided.
 εἶρω/λέγω, ἐρῶ/ερέω, εἶπον, εἶρηκα, εἴρημαι, ἐρήθη : *vb*, say, speak; *per pass part*, ειρημένος -η -ον, *adj*, said, aforementioned.
 εἴτε ... εἴτε : *ind*, either ... or.
 ἕκαστος -η -ον : *pro*, each, every one.
 ἑκατέρω -α -ον : *pro*, each (of two).
 ἐκβάλλω : *vb*, produce (a line); see βάλλω.
 ἐκθέω : *vb*, set out.
 ἔκκειμαι : *vb*, be set out, be taken; see κείμαι.
 ἐκτίθημι : *vb*, set out; see τίθημι.
 ἐκτός : *pre + gen*, outside, external.
 ἐλάσσων/ἐλάττων -ον : *adj*, less, lesser.
 ἐλάχιστος -η -ον : *adj*, least.
 ἐλλείπω : *vb*, be less than, fall short of.
 ἐμπίπτω : *vb*, meet (of lines), fall on; see πίπτω.
 ἔμπροσθεν : *adv*, in front.
 ἐναλλάξ : *adv*, alternate(ly).
 ἐναρμόζω : *vb*, insert; *perf indic pass 3rd sg*, ἐνήρμοστα.
 ἐνδέχομαι : *vb*, admit, allow.
 ἔνεκεν : *ind*, on account of, for the sake of.
 ἐνναπλάσιος -α -ον : *adj*, nine-fold, nine-times.
 ἔννοια, ἡ : *no*, notion.
 ἐνπεριέχω : *vb*, encompass; see ἔχω.
 ἐνπίπτω : see ἐμπίπτω.
 ἐντός : *pre + gen*, inside, interior, within, internal.
 ἑξάγωνος -ον : *adj*, hexagonal; τὸ ἑξάγωνον, *no*, hexagon.
 ἑξαπλάσιος -α -ον : *adj*, sixfold.
 ἑξῆς : *adv*, in order, successively, consecutively.
 ἔξωθεν : *adv*, outside, extrinsic.
 ἐπάνω : *adv*, above.
 ἐπαφή, ἡ : *no*, point of contact.
 ἐπεί : *conj*, since (causal).
 ἐπειδήπερ : *ind*, inasmuch as, seeing that.
 ἐπιζεύγνυμι, ἐπιζεύζω, ἐπέζευξα, —, ἐπέζευγμαι, ἐπέζεύχθη : *vb*, join (by a line).
 ἐπιλογίζομαι : *vb*, conclude.
 ἐπινοέω : *vb*, think of, contrive.
 ἐπιπέδος -ον : *adj*, level, flat, plane; τὸ ἐπιπέδον, *no*, plane.
 ἐπισκέπτομαι : *vb*, investigate.
 ἐπίσκεψις -εως, ἡ : *no*, inspection, investigation.
 ἐπιτάσσω : *vb*, put upon, enjoin; τὸ ἐπιταχθέν, *no*, the (thing) prescribed; see τάσσω.
 ἐπίτριτος -ον : *adj*, one and a third times.
 ἐπιφάνεια, ἡ : *no*, surface.
 ἔπομαι : *vb*, follow.
 ἔρχομαι, ἐλεύσομαι, ἦλθον, ἐλήλυθα, —, — : *vb*, come, go.
 ἔσχατος -η -ον : *adj*, outermost, uttermost, last.
 ἑτερόμηκης -ες : *adj*, oblong; τὸ ἑτερόμηκες, *no*, rectangle.
 ἕτερος -α -ον : *adj*, other (of two).
 ἔτι : *par*, yet, still, besides.
 εὐθύγραμμος -ον : *adj*, rectilinear; τὸ εὐθύγραμμον, *no*, rectilinear figure.
 εὐθύς -εῖα -ύ : *adj*, straight; ἡ εὐθεῖα, *no*, straight-line; ἐπ' εὐθεῖας, in a straight-line, straight-on.
 εὐρίσκω, εὐρήσκω, ἤρουν, εὕρεκα, εὕρημαι, εὐρέθη : *vb*, find.
 ἐφάπτω : *vb*, bind to; *mid*, touch; ἡ ἐφαπτομένη, *no*, tangent; see ἄπτω.
 ἐφαρμόζω, ἐφαρμόσω, ἐφήρμοσα, ἐφήμοκα, ἐφήμοσμαι, ἐφήμόσθη : *vb*, coincide; *pass*, be applied.
 ἐφεξῆς : *adv*, in order, adjacent.
 ἐφίστημι : *vb*, set, stand, place upon; see ἵστημι.
 ἔχω, ἔξω, ἔσχον, ἔσχηκα, -έσχημαι, — : *vb*, have.
 ἡγέομαι, ἡγήσομαι, ἡγησάμην, ἡγηναι, —, ἡγήθη : *vb*, lead.
 ἦδη : *ind*, already, now.
 ἦκα, ἦξω, —, —, —, — : *vb*, have come, be present.
 ἡμικύκλιον, τό : *no*, semi-circle.
 ἡμιόλιος -α -ον : *adj*, containing one and a half, one and a half times.
 ἡμισυς -εια -υ : *adj*, half.
 ἥπερ = ἦ + περ : *conj*, than, than indeed.

- ἤτοι ... ἤ : *par*, surely, either ... or; in fact, either ... or.
 θέσις -εως, ἡ : *no*, placing, setting, position.
 θεωρημα -ατος, τό : *no*, theorem.
 ἴδιος -α -ον : *adj*, one's own.
 ἰσάκις : *adv*, the same number of times; ἰσάκις πολλαπλάσια, the same multiples, equal multiples.
 ἰσογώνιος -ον : *adj*, equiangular.
 ἰσόπλευρος -ον : *adj*, equilateral.
 ἰσοπληθής -ές : *adj*, equal in number.
 ἴσος -η -ον : *adj*, equal; ἐξ ἴσου, equally, evenly.
 ἰσοσκελής -ές : *adj*, isosceles.
 ἴστημι, στήσω, ἔστησα, —, —, ἐστάνην : *vb tr*, stand (something).
 ἴστημι, στήσω, ἔστην, ἔστηκα, ἔσταμαι, ἐσταθην : *vb intr*, stand up (oneself); Note: perfect *I have stood up* can be taken to mean present *I am standing*.
 ἰσοϋψής -ές : *adj*, of equal height.
 καθάπερ : *ind*, according as, just as.
 κάθετος -ον : *adj*, perpendicular.
 καθόλου : *adv*, on the whole, in general.
 καλέω : *vb*, call.
 κάκεινος = καὶ ἐκεῖνος .
 καὶν = καὶ ἄν : *ind*, even if, and if.
 καταγραφή, ἡ : *no*, diagram, figure.
 καταγράφω : *vb*, describe/draw, inscribe (a figure); see γράφω.
 κατακολουθῶ : *vb*, follow after.
 καταλείπω : *vb*, leave behind; see λείπω; τὰ καταλειπόμενα, *no*, remainder.
 κατὰλληλος -ον : *adj*, in succession, in corresponding order.
 καταμετρέω : *vb*, measure (exactly).
 καταντάω : *vb*, come to, arrive at.
 κατασκευάζω : *vb*, furnish, construct.
 κεῖμαι, κεῖσομαι, —, —, —, — : *vb*, have been placed, lie, be made; see τίθημι.
 κέντρον, τό : *no*, center.
 κλάω : *vb*, break off, inflect.
 κλίνω, κλίνω, ἔκλινα, κέκλικα, κέκλιμαι, ἐκλίθην : *vb*, lean, incline.
 κλίσις -εως, ἡ : *no*, inclination, bending.
 κοῖλος -η -ον : *adj*, hollow, concave.
 κορυφή, ἡ : *no*, top, summit, apex; κατὰ κορυφήν, vertically opposite (of angles).
 κρίνω, κρίνω, ἔκρινα, κέκρικα, κέκριμαι, ἐκρίθην : *vb*, judge.
 κύβος, ὁ : *no*, cube.
 κύκλος, ὁ : *no*, circle.
 κύλινδρος, ὁ : *no*, cylinder.
 κυρτός -ή -όν : *adj*, convex.
 κῶνος, ὁ : *no*, cone.
 λαμβάνω, λήψομαι, ἔλαβον, εἴληφα εἴλημαι, ἐλήφθην : *vb*, take.
 λέγω : *vb*, say; *pres pass part*, λεγόμενος -η -ον, *adj*, so-called; see ἔιρω.
 λείπω, λείψω, ἔλιπον, ἐλείπια, ἐλείμμαι, ἐλείφθην : *vb*, leave, leave behind.
 λημμάτιον, τό : *no*, diminutive of λῆμμα.
 λῆμμα -ατος, τό : *no*, lemma.
 λῆψις -εως, ἡ : *no*, taking, catching.
 λόγος, ὁ : *no*, ratio, proportion, argument.
 λοιπός -ή -όν : *adj*, remaining.
 μαθάνω, μαθήσομαι, ἔμαθον, μεμάθηκα, —, — : *vb*, learn.
 μέγεθος -εος, τό : *no*, magnitude, size.
 μείζων -ον : *adj*, greater.
 μένω, μενῶ, ἔμεινα, μεμένηκα, —, — : *vb*, stay, remain.
 μέρος -ους, τό : *no*, part, direction, side.
 μέσος -η -ον : *adj*, middle, mean, medial; ἐκ δύο μέσων, bimedial.
 μεταλαμβάνω : *vb*, take up.
 μεταξύ : *adv*, between.
 μετέωρος -ον : *adj*, raised off the ground.
 μετρέω : *vb*, measure.
 μέτρον, τό : *no*, measure.
 μηδεῖς, μηδεμία, μηδέν : *adj*, not even one, (neut.) nothing.
 μηδέποτε : *adv*, never.
 μηδέτερος -α -ον : *pro*, neither (of two).
 μήκος -εος, τό : *no*, length.
 μήν : *par*, truly, indeed.
 μονάς -άδος, ἡ : *no*, unit, unity.
 μοναχός -ή -όν : *adj*, unique.
 μοναχῶς : *adv*, uniquely.
 μόνος -η -ον : *adj*, alone.
 νοέω, —, νόησα, νενόηκα, νενόημαι, ἐνόηθην : *vb*, apprehend, conceive.
 οἷος -α -ον : *pre*, such as, of what sort.
 ὀκτάεδρος -ον : *adj*, eight-sided.
 ὅλος -η -ον : *adj*, whole.
 ὁμογενής -ές : *adj*, of the same kind.
 ὅμοιος -α -ον : *adj*, similar.
 ὁμοιοπληθής -ές : *adj*, similar in number.
 ὁμοιοταγής -ές : *adj*, similarly arranged.
 ὁμοιότης -ητος, ἡ : *no* similarity.
 ὁμοίως : *adv*, similarly.
 ὁμόλογος -ον : *adj*, corresponding, homologous.
 ὁμοταγής -ές : *adj*, ranged in the same row or line.
 ὁμώνυμος -ον : *adj*, having the same name.
 ὄνομα -ατος, τό : *no*, name; ἐκ δύο ὀνομάτων, binomial.

- ὀξυγώνιος -ον : *adj*, acute-angled; τὸ ὀξυγώνιον, *no*, acute angle.
- ὀξύς -εῖα -ύ : *adj*, acute.
- ὅποιοσοῦν = ὅποῖος -α -ον + οὖν : *adj*, of whatever kind, any kind whatsoever.
- ὅπόσος -η -ον : *pro*, as many, as many as.
- ὅποσοσδηποτοῦν = ὅπόσος -η -ον + δὴ + ποτέ + οὖν : *adj*, of whatever number, any number whatsoever.
- ὅποσοσοῦν = ὅπόσος -η -ον + οὖν : *adj*, of whatever number, any number whatsoever.
- ὅπότερος -α -ον : *pro*, either (of two), which (of two).
- ὀρθογώνιον, τό : *no*, rectangle, right-angle.
- ὀρθός -ῆ -όν : *adj*, straight, right-angled, perpendicular; πρὸς ὀρθὰς γωνίας, at right-angles.
- ὅρος, ὁ : *no*, boundary, definition, term (of a ratio).
- ὅσαδηποτοῦν = ὅσα + δὴ + ποτέ + οὖν : *ind*, any number whatsoever.
- ὁσάκις : *ind*, as many times as, as often as.
- ὁσαπλάσιος -ον : *pro*, as many times as.
- ὅσος -η -ον : *pro*, as many as.
- ὅσπερ, ἥπερ, ὅπερ : *pro*, the very man who, the very thing which.
- ὅστις, ἥτις, ὅ τι : *pro*, anyone who, anything which.
- ὅταν : *adv*, when, whenever.
- ὅτιοῦν : *ind*, whatsoever.
- οὐδεῖς, οὐδεμία, οὐδέν : *pro*, not one, nothing.
- οὐδέτερος -α -ον : *pro*, not either.
- οὐθέτερος : see οὐδέτερος.
- οὐθέν : *ind*, nothing.
- οὖν : *adv*, therefore, in fact.
- οὕτως : *adv*, thusly, in this case.
- πάλιν : *adv*, back, again.
- πάντως : *adv*, in all ways.
- παρὰ : *prep* + *acc*, parallel to.
- παραβάλλω : *vb*, apply (a figure); see βάλλω.
- παραβολή, ἡ : *no*, application.
- παράκειμαι : *vb*, lie beside, apply (a figure); see κείμεναι.
- παραλλάσσω, παραλλάξω, —, παρήλλαχα, —, — : *vb*, miss, fall awry.
- παραλληλεπίπεδος, -ον : *adj*, with parallel surfaces; τὸ παραλληλεπίπεδον, *no*, parallelepiped.
- παραλληλόγραμμος -ον : *adj*, bounded by parallel lines; τὸ παραλληλόγραμμον, *no*, parallelogram.
- παράλληλος -ον : *adj*, parallel; τὸ παράλληλον, *no*, parallel, parallel-line.
- παραπλήρωμα -ατος, τό : *no*, complement (of a parallelogram).
- παρατέλυστος -ον : *adj*, penultimate.
- παρέκ : *prep* + *gen*, except.
- παρεμπίπτω : *vb*, insert; see πίπτω.
- πάσχω, πείσομαι, ἔπαθον, πέπονθα, —, — : *vb*, suffer.
- πεντάγωνος -ον : *adj*, pentagonal; τὸ πεντάγωνον, *no*, pentagon.
- πενταπλάσιος -α -ον : *adj*, five-fold, five-times.
- πεντεκαίδεκάγωνον, τό : *no*, fifteen-sided figure.
- πεπερασμένος -η -ον : *adj*, finite, limited; see περαίνω.
- περαίνω, περανῶ, ἐπεράνα, —, πεπεράσμαι, ἐπερανάνθη : *vb*, bring to end, finish, complete; *pass*, be finite.
- πέρας -ατος, τό : *no*, end, extremity.
- περατώ, —, —, —, —, — : *vb*, bring to an end.
- περιγράφω : *vb*, circumscribe; see γράφω.
- περιέχω : *vb*, encompass, surround, contain, comprise; see ἔχω.
- περιλαμβάνω : *vb*, enclose; see λαμβάνω.
- περισσάκις : *adv*, an odd number of times.
- περισσός -ῆ -όν : *adj*, odd.
- περιφέρεια, ἡ : *no*, circumference.
- περιφέρω : *vb*, carry round; see φέρω.
- πηλικότης -ητος, ἡ : *no*, magnitude, size.
- πίπτω, πεσοῦμαι, ἔπεσον, πέπτωκα, —, — : *vb*, fall.
- πλάτος -εος, τό : *no*, breadth, width.
- πλείων -ον : *adj*, more, several.
- πλευρά, ἡ : *no*, side.
- πληθος -εος, τό : *no*, great number, multitude, number.
- πλήν : *adv* & *prep* + *gen*, more than.
- ποιός -ά -όν : *adj*, of a certain nature, kind, quality, type.
- πολλαπλασιάζω : *vb*, multiply.
- πολλαπλασιασμός, ὁ : *no*, multiplication.
- πολλαπλάσιον, τό : *no*, multiple.
- πολύεδρος -ον : *adj*, polyhedral; τό πολύεδρον, *no*, polyhedron.
- πολύγωνος -ον : *adj*, polygonal; τό πολύγωνον, *no*, polygon.
- πολύπλευρος -ον : *adj*, multilateral.
- πόρισμα -ατος, τό : *no*, corollary.
- ποτέ : *ind*, at some time.
- πρίσμα -ατος, τό : *no*, prism.
- προβαίνω : *vb*, step forward, advance.
- προδείκνυμι : *vb*, show previously; see δείκνυμι.
- προεχτίθηναι : *vb*, set forth beforehand; see τίθηναι.
- προερέω : *vb*, say beforehand; *perf pass part*, προειρημένος -η -ον, *adj*, aforementioned; see εἶρω.
- προσαναπληρώω : *vb*, fill up, complete.
- προσαναγράφω : *vb*, complete (tracing of); see γράφω.
- προσαρμόζω : *vb*, fit to, attach to.
- προσεχβάλλω : *vb*, produce (a line); see ἐχβάλλω.
- προσευρίσκω : *vb*, find besides, find; see εὐρίσκω.
- προσλαμβάνω : *vb*, add.
- πρόκειμαι : *vb*, set before, prescribe; see κείμεναι.
- πρόσκειμαι : *vb*, be laid on, have been added to; see κείμεναι.

- προσπίπτω : *vb*, fall on, fall toward, meet; see πίπτω.
 προτάσις -εως, ἡ : *no*, proposition.
 προστάσσω : *vb*, prescribe, enjoin; τὸ προσταχθέν, *no*, the thing prescribed; see τάσσω.
 προστίθημι : *vb*, add; see τίθημι.
 πρότερος -α -ον : *adj*, first (comparative), before, former.
 προτίθημι : *vb*, assign; see τίθημι.
 προχωρέω : *vb*, go/come forward, advance.
 πρωτός -α -ον : *adj*, first, prime.
 πυραμῖς -ίδος, ἡ : *no*, pyramid.
 ῥητός -ή -όν : *adj*, expressible, rational.
 ῥομβοειδής -ές : *adj*, rhomboidal; τὸ ῥομβοειδές, *no*, rhomboid.
 ῥόμβος, ὁ *no*, rhombus.
 σημεῖον, τό : *no*, point.
 σκαληνός -ή -όν : *adj*, scalene.
 στερεός -ά -όν : *adj*, solid; τὸ στερεόν, *no*, solid, solid body.
 στοιχεῖον, τό : *no*, element.
 στρέφω, -στρέψω, ἔστρεψα, —, ἐσταμμαι, ἐστάφην : *vb*, turn.
 σύγκειμαι : *vb*, lie together, be the sum of, be composed;
 συγγείμενος -η -ον, *adj*, composed (ratio), compounded;
 see κείμεναι.
 σύγκρινω : *vb*, compare; see κρίνω.
 συμβαίνω : *vb*, come to pass, happen, follow; see βαίνω.
 συμβάλλω : *vb*, throw together, meet; see βάλλω.
 σύμμετρος -ον : *adj*, commensurable.
 σύμπας -αντος, ὁ : *no*, sum, whole.
 συμπίπτω : *vb*, meet together (of lines); see πίπτω.
 συμπληρόω : *vb*, complete (a figure), fill in.
 συνάγω : *vb*, conclude, infer; see ἄγω.
 συναμφότεροι -αι -α : *adj*, both together; ὁ συναμφότερος, *no*, sum (of two things).
 συναποδείκνυμι : *no*, demonstrate together; see δείκνυμι.
 συναφή, ἡ : *no*, point of junction.
 σύνδυο, οἱ, αἱ, τὰ : *no*, two together, in pairs.
 συνεχής -ές : *adj*, continuous; κατὰ τὸ συνεχές, continuously.
 σύνθεσις -εως, ἡ : *no*, putting together, composition.
 σύνθετος -ον : *adj*, composite.
 συ[ν]ίστημι : *vb*, construct (a figure), set up together; *perf imperat pass 3rd sg*, συνεστάτω; see ἵστημι.
 συντίθημι : *vb*, put together, add together, compound (ratio); see τίθημι.
 σχέσις -εως, ἡ : *no*, state, condition.
 σχῆμα -ατος, τό : *no*, figure.
 σφαῖρα -ας, ἡ : *no*, sphere.
 τάξις -εως, ἡ : *no*, arrangement, order.
 ταραάσσω, ταραάξω, —, —, τετάραγμα, ἐταράχθην : *vb*, stir, trouble, disturb; τεταραγμένος -η -ον, *adj*, disturbed, perturbed.
 τάσσω, τάξω, ἔταξα, τέταχα, τέταγμα, ἐτάχθην : *vb*, arrange, draw up.
 τέλειος -α -ον : *adj*, perfect.
 τέμνω, τεμνῶ, ἔτεμον, -τέμνηκα, τέμνημαι, ἐτέμην : *vb*, cut; *pres/fut indic act 3rd sg*, τέμει.
 τεταρτημοριον, τό : *no*, quadrant.
 τετράγωνος -ον : *adj*, square; τὸ τετράγωνον, *no*, square.
 τετράκις : *adv*, four times.
 τετραπλάσιος -α -ον : *adj*, quadruple.
 τετραπλευρος -ον : *adj*, quadrilateral.
 τετραπλός -η -ον : *adj*, fourfold.
 τίθημι, θήσω, ἔθηκα, τέθηκα, κείμεναι, ἐτέθην : *vb*, place, put.
 τμήμα -ατος, τό : *no*, part cut off, piece, segment.
 τοῖνον : *par*, accordingly.
 τοιοῦτος -αύτη -οὔτο : *pro*, such as this.
 τομεύς -έως, ὁ : *no*, sector (of circle).
 τομή, ἡ : *no*, cutting, stump, piece.
 τόπος, ὁ : *no*, place, space.
 τοσυντάκις : *adv*, so many times.
 τοσυνταπλάσιος -α -ον : *pro*, so many times.
 τοσοῦτος -αύτη -οὔτο : *pro*, so many.
 τουτέστι = τοῦτ' ἔστι : *par*, that is to say.
 τραπέζιον, τό : *no*, trapezium.
 τρίγωνος -ον : *adj*, triangular; τὸ τρίγωνον, *no*, triangle.
 τριπλάσιος -α -ον : *adj*, triple, threefold.
 τρίπλευρος -ον : *adj*, trilateral.
 τριπλός -η -ον : *adj*, triple.
 τρόπος, ὁ : *no*, way.
 τυγχάνω, τεύζομαι, ἔτυχον, τετύχηκα, τέτευγμα, ἐτεύχθην : *vb*, hit, happen to be at (a place).
 ὑπάρχω : *vb*, begin, be, exist; see ἄρχω.
 ὑπεξάρσεις -εως, ἡ : *no*, removal.
 ὑπερβάλλω : *vb*, overshoot, exceed; see βάλλω.
 ὑπεροχή, ἡ : *no*, excess, difference.
 ὑπερέχω : *vb*, exceed; see ἔχω.
 ὑπόθεσις -εως, ἡ : *no*, hypothesis.
 ὑπόκειμαι : *vb*, underlie, be assumed (as hypothesis); see κείμεναι.
 ὑπολείπω : *vb*, leave remaining.
 ὑποτείνω, ὑποτενῶ, ὑπέτεινα, ὑποτέτακα, ὑποτέταμαι, ὑπετάθην : *vb*, subtend.
 ὕψος -εος, τό : *no*, height.
 φανερός -ά -όν : *adj*, visible, manifest.
 φημι, φήσω, ἔφην, —, —, — : *vb*, say; ἔφραμεν, we said.
 φέρω, οἴσω, ἤνεγκον, ἐνήνοχα, ἐνήνεγμα, ἤνεχθην : *vb*, carry.
 χώριον, τό : *no*, place, spot, area, figure.
 χωρίς : *pre + gen*, apart from.
 ψάύω : *vb*, touch.
 ὥς : *par*, as, like, for instance.
 ὥς ἔτυχεν : *par*, at random.
 ὡσαύτως : *adv*, in the same manner, just so.
 ὥστε : *conj*, so that (causal), hence.

