

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 δή, ὅτι παρὰ τὰ εἰρημένα πέντε σχήματα οὐ συσταθήσεται ἔτερον σχῆμα περιεχόμενον ὑπὸ ἴσοπλεύρων τε καὶ ἴσογωνίων ἵσων ἀλλήλοις.

Ὑπὸ μὲν γάρ δύο τριγώνων ἡ ὄλως ἐπιπέδων στερεὰ γωνία οὐ συνίσταται. ὑπὸ δὲ τριῶν τριγώνων ἡ τῆς πυραμίδος, ὑπὸ δὲ τεσσάρων ἡ τοῦ ὀκταέδρου, ὑπὸ δὲ πέντε ἡ τοῦ εἰκοσαέδρου· ὑπὸ δὲ ἕξ τριγώνων ἴσοπλεύρων τε καὶ ἴσογωνίων πρὸς ἐνὶ σημείῳ συνισταμένων οὐκ ἔσται στερεὰ γωνία· οὔσης γάρ τῆς τοῦ ἴσοπλεύρου τριγώνου γωνίας δικυοίρου ὁρθῆς ἔσονται αἱ ἔξ τέσσαρεις ἵσαι· ὅπερ ἀδύνατον· ἀπασα γάρ στερεὰ γωνία ὑπὸ ἐλασσόνων ἡ τεσσάρων ὁρθῶν περέχεται· διὰ τὰ αὐτὰ δὴ οὐδὲ ὑπὸ πλειόνων ἡ ἔξ γωνιῶν ἐπιπέδων στερεὰ γωνία συνίσταται. ὑπὸ δὲ τετραγώνων τριῶν ἡ τοῦ κύβου γωνία περιέχεται· ὑπὸ δὲ τεσσάρων ἀδύνατον· ἔσονται γάρ πάλιν τέσσαρες ὁρθαῖς. ὑπὸ δὲ πενταγώνων ἴσοπλεύρων καὶ ἴσογωνίων, ὑπὸ μὲν τριῶν ἡ τοῦ δωδεκαέδρου· ὑπὸ δὲ τεσσάρων ἀδύνατον· οὔσης γάρ τῆς τοῦ πενταγώνου ἴσοπλεύρου γωνίας ὁρθῆς καὶ πέμπτου, ἔσονται αἱ τέσσαρες γωνίαι τεσσάρων ὁρθῶν μείζους· ὅπερ ἀδύνατον. οὐδὲ μὴν ὑπὸ πολυγώνων ἔτερων σχημάτων περισχεθήσεται στερεὰ γωνία διὰ τὸ αὐτὸ δάπον.

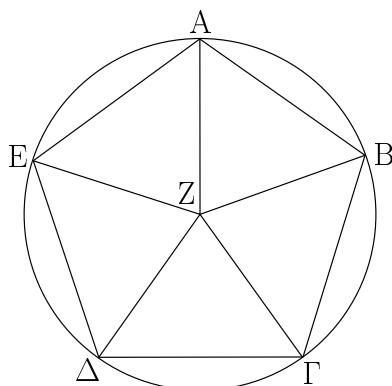
Οὐκ ἄφα παρὰ τὰ εἰρημένα πέντε σχήματα ἔτερον σχῆμα στερεὸν συσταθήσεται ὑπὸ ἴσοπλεύρων τε καὶ ἴσογωνίων περιεχόμενον· ὅπερ ἔδει δεῖξαι.

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

(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.

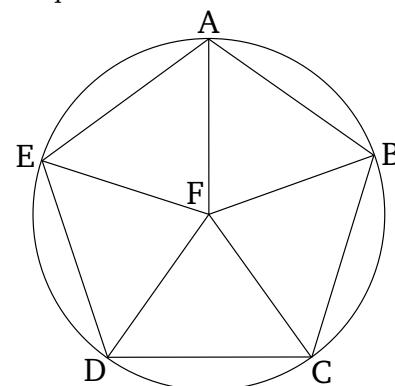
Thus, beside the five aforementioned figures, no other solid figure can be constructed (which is) contained by equilateral and equiangular (planes). (Which is) the very thing it was required to show.



Λῆμμα.

Ὅτι δὲ ἡ τοῦ ἴσοπλεύρου καὶ ἴσογωνίου πενταγώνου γωνία ὁρθή ἔστι καὶ πέμπτου, οὕτω δεικτέον.

Ἐστω γάρ πεντάγωνον ἴσοπλεύρουν καὶ ἴσογώνιον τὸ ΑΒΓΔΕ, καὶ περιγεγράφω περὶ αὐτὸν κύκλος ὁ ΑΒΓΔΕ, καὶ εἰλήφθω αὐτοῦ τὸ κέντρον τὸ Ζ, καὶ ἐπεζεύχθωσαν αἱ ΖΑ, ΖΒ, ΖΓ, ΖΔ, ΖΕ. δίχα ἄρα τέμνουσι τὰς πρὸς τοὺς Α, Β, Γ, Δ, Ε τοῦ πενταγώνου γωνίας. καὶ ἐπεὶ αἱ πρὸς τῷ Ζ πέντε γωνίαι τέσσαριν ὁρθαῖς ἴσαι εἰσὶ καὶ εἰσιν ἴσαι, μία ἄρα αὐτῶν, ὡς ἡ ὑπὸ ΖΑΒ, μίας ὁρθῆς ἔστι παρὰ πέμπτου λοιπαὶ ἄρα αἱ ὑπὸ ΖΒΓ, ΖΓΔ, ΖΔΕ, ΖΕΑ εἰσιν ὁρθῆς καὶ πέμπτου. Ἰση δὲ ἡ ὑπὸ ΖΑΒ τῇ ὑπὸ ΖΒΓ· καὶ ὅλη ἄρα ἡ ὑπὸ ΑΒΓ τοῦ πενταγώνου γωνία μίας ἔστιν ὁρθῆς καὶ πέμπτου· ὅπερ ἔδει δεῖξαι.



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, ἤγαγον, -ῆχα, ἤγμα, ἤχθην : *vb*, lead, draw (a line).
ἀδύνατος -ον : *adj*, impossible.

ἀεί : *adv*, always, for ever.

ἀἱρέω, αἱρήσω, εἴ[η]λον, ἥρηκα, ἥρημαι, ἥρεθην : *vb*, grasp.

ἀιτέω, αἰτήσω, ἤτησα, ἤτηκα, ἤτημαι, ἤτηθη : *vb*, postulate.

αἴτημα -ατος, τό : *no*, postulate.

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

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

ἀλλά : *conj*, but, otherwise.

ἄλογος -ον : *adj*, irrational.

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

ἀμβλυγώνιος -ον : *adj*, obtuse-angled; τὸ ἀμβλυγώνιον, *no*, obtuse angle.

ἀμβλύς -εῖα -ύ : *adj*, obtuse.

ἀμφότερος -α -ον : *pro*, both.

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

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

ἀνάλογος -ον : *adj*, proportional.

ἀνάπολιν : *adv*, inverse(ly).

αναπληρόω : *vb*, fill up.

ἀναστρέψω : *vb*, turn upside down, convert (ratio); see στρέψω.

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

ἀνθυφαιρέω : *vb*, take away in turn; see αἱρέω.

ἀνίστημι : *vb*, set up; see ἵστημι.

ἄνισος -ον : *adj*, unequal, uneven.

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

ἄξων -ονος, ὁ : *vb*, axis.

ἄπαξ : *adv*, once.

ἄπας, ἄπασα, ἄπαν : *adj*, quite all, the whole.

ἄπειρος -ον : *adj*, infinite.

ἀπεναντίον : *ind*, opposite.

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

ἀπλατής -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, —, ἥψαται, — : *vb*, touch, join, meet.

ἀπώτερος -α -ον : *adj*, further off.

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

ἄριθμός, ὁ : *no*, number.

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

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

ἄρχω, ἄρξω, ἥρξα, ἥρχα, ἥργμαι, ἥρχθην : *vb*, rule; *mid.*, begin.

ἄσύμμετρος -ον : *adj*, incommensurable.

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

ἄρτιος -α -ον : *adj*, even, perfect.

ἄτμητος -ον : *adj*, uncut.

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

ἄντοθεν : *adv*, immediately, obviously.

ἄφαιρεω : *vb*, take from, subtract from, cut off from; see αἱρέω.

ἄφρη, ἡ : *no*, point of contact.

βάθος -εος, τό : *no*, depth, height.

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

βάλλω, βαλῶ, βέβαλον, βέβληκα, βέβλημαι, ἐβλήθην : *vb*, throw.

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

γάρ : *conj*, for (explanatory).

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

γνώμων -ονος, ἡ : *no*, gnomon.

γραμμή, ἡ : *no*, line.

γράφω, γράψω, ἔγρα[ψ]α, γέγραφα, γέγραμμαι, ἐραψάμην : *vb*, draw (a figure).

γωνία, ἡ : *no*, angle.

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

δείκνυμι, δείξω, ἔδειξα, δέδειχα, δέδειγμαι, ἔδείχθην : *vb*, show, demonstrate.

δεικτέον : *ind*, one must show.

δεῖξις -εως, ἡ : *no*, proof.

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

δέχομαι, δέξομαι, ἔδεξάμην, —, δέδειγμαι, ἔδέχθην : *vb*, receive, accept.

δή : *conj*, so (explanatory).

δηλαδή : *ind*, quite clear, manifest.

δῆλος -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.

- διαρέω : *vb*, divide (in two); διαρεθέντος -η -ον, *adj*, separated (ratio); see αἱρέω.
- διάστημα -ατος, τό : *no*, radius.
- διαφέρω : *vb*, differ; see φέρω.
- δίδωμι, δώσω, ἔδωκα, δέδωκα, δέδομαι, ἔδόθην : *vb*, give.
- δύμοίρος -ον : *adj*, two-thirds.
- διπλασία : *vb*, double.
- διπλάσιος -α -ον : *adj*, double, twofold.
- διπλασίων -ον : *adj*, double, twofold.
- διπλοῦς -ῆ -ον : *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.
- δύναμι : *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.
- ἐγγίων -ον : *adj*, nearer, nearest.
- ἐγγράψω : *vb*, inscribe; see γράψω.
- εἴδος -εος, τό : *no*, figure, form, shape.
- εἰκοσάεδρος -ον : *adj*, twenty-sided.
- εἴρω/λέγω, ἐρῶ/ερέω, εἴπον, εἴρηκα, εἴρημαι, ἐρρήθην : *vb*, say, speak; *per pass part*, ειρημένος -η -ον, *adj*, said, aforementioned.
- εἴτε ... εἴτε : *ind*, either ... or.
- ἐκαστος -η -ον : *pro*, each, every one.
- ἐκατέρος -α -ον : *pro*, each (of two).
- ἐκβάλλω : *vb*, produce (a line); see βάλλω.
- ἐκθέω : *vb*, set out.
- ἐκκειμα : *vb*, be set out, be taken; see κεῖμα.
- 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.
- ἐμπροσθεν : *adv*, in front.
- ἐναλλάξ : *adv*, alternate(ly).
- ἐναρμόζω : *vb*, insert; *perf indic pass 3rd sg*, ἐνήρμοσται.
- ἐνδέχομαι : *vb*, admit, allow.
- ἐνεκεν : *ind*, on account of, for the sake of.
- ἐνναπλάσιος -α -ον : *adj*, nine-fold, nine-times.
- ἐννοια, ἡ : *no*, notion.
- ενπεριέχω : *vb*, encompass; see ἔχω.
- ἐνπίπτω : see ἐμπίπτω.
- ἐντός : *pre + gen*, inside, interior, within, internal.
- ἐξάγωνος -ον : *adj*, hexagonal; τὸ ἑξάγωνον, *no*, hexagon.
- ἐξαπλάσιος -α -ον : *adj*, sixfold.
- ἐξῆς : *adv*, in order, successively, consecutively.
- ἐξωθεν : *adv*, outside, extrinsic.
- ἐπάνω : *adv*, above.
- ἐπαφή, ἡ : *no*, point of contact.
- ἐπει : *conj*, since (causal).
- ἐπειδήπερ : *ind*, inasmuch as, seeing that.
- ἐπιζεύγνυμι, ἐπιζεύξω, ἐπέζευξα, —, ἐπέζευγμαι, ἐπέζεύχθην : *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.
- ἐπομαι : *vb*, follow.
- ἔρχομαι, ἐλεύσομαι, ἥλθον, ἐλήλυθα, —, — : *vb*, come, go.
- ἔσχατος -η -ον : *adj*, outermost, uttermost, last.
- ἔτερόμηκης -ες : *adj*, oblong; τὸ ἔτερόμηκες, *no*, rectangle.
- ἔτερος -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.
- εύρισκω, εύρήσκω, ηύρον, εύρεκα, εύρημαι, εύρέθην : *vb*, find.
- ἐφάπτω : *vb*, bind to; *mid*, touch; ἡ ἐφαπτομένη, *no*, tangent; see ἀπτω.
- ἐφαρμόζω, ἐφαρμόσω, ἐφήρμοσα, ἐφήμοκα, ἐφήμοσμαι, ἐφήμόσθην : *vb*, coincide; *pass*, be applied.
- ἐφεξῆς : *adv*, in order, adjacent.
- ἐφίστημι : *vb*, set, stand, place upon; see ίστημι.
- ἔχω, ἔξω, ἔσχον, ἔσχηκα, -έσχημαι, — : *vb*, have.
- ἡγέομαι, ἡγήσομαι, ἡγησάμην, ἡγημαι, —, ἡγήθην : *vb*, lead.
- ἥδη : *ind*, already, now.
- ἥκω, ἤξω, —, —, —, — : *vb*, have come, be present.
- ἥμικύλιον, τό : *no*, semi-circle.
- ἥμιόλιος -α -ον : *adj*, containing one and a half, one and a half times.
- ἥμισυς -εια -υ : *adj*, half.
- ἥπερ = ἡ + περ : *conj*, than, than indeed.

ἢτοι ... ἢ : *par*, surely, either ... or; in fact, either ... or.
 θέσις -εως, ἡ : *no*, placing, setting, position.
 θεωρημα -ατος, τό : *no*, theorem.
 ιδιος -α -ον : *adj*, one's own.
 ισάκις : *adv*, the same number of times; ισάκις πολλαπλάσια,
 the same multiples, equal multiples.
 ισογώνιος -ον : *adj*, equiangular.
 ισόπλευρος -ον : *adj*, equilateral.
 ισοπληθής -ές : *adj*, equal in number.
 ισος -η -ον : *adj*, equal; ἐξ ισου, equally, evenly.
 ισοσκελής -ές : *adj*, isosceles.
 ιστημι, στήσω, ἔστησα, —, —, ἔσταθην : *vb tr*, stand (something).
 ιστημι, στήσω, ἔστην, ἔστηκα, ἔσταμαι, ἔσταθην : *vb intr*, stand up (oneself); Note: perfect *I have stood up* can be taken to mean present *I am standing*.
 ισούψης -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 ἔκεινος .
 κἄν = καὶ ἂν : *ind*, even if, and if.
 καταγραφή, ἡ : *no*, diagram, figure.
 καταγράφω : *vb*, describe/draw, inscribe (a figure); see γράφω.
 κατακολουθέω : *vb*, follow after.
 καταλείπω : *vb*, leave behind; see λείπω; τὰ καταλειπόμενα, *no*, remainder.
 κατάλληλος -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, ἔκλιθην : *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, κρινῶ, ἔκρινα, κέκρικα, κέκριμαι, ἔκριθην : *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 εἴλημμαι, ἐλήφθην : *vb*, take.
 λέγω : *vb*, say; *pres pass part*, λεγόμενος -η -ον, *adj*, so-called; see ἔιρω.
 λείπω, λείψω, ἔλιπον, λέλοιπα, λέλειμμαι, 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.
 μανθάνω, μαθήσομαι, ἔμαθον, μεμάθηκα, —, — : *vb*, learn.
 μέγεθος -εος, τό : *no*, magnitude, size.
 μείζων -ον : *adj*, greater.
 μένω, μενῶ, ἔμενα, 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.
 μηδείς, μηδεμία, μηδέν : *adj*, not even one, (neut.) nothing.
 μηδέποτε : *adv*, never.
 μηδέτερος -α -ον : *pro*, neither (of two).
 μῆκος -εος, τό : *no*, length.
 μήν : *par*, truly, indeed.
 μονάς -άδος, ἡ : *no*, unit, unity.
 μοναχός -ή -όν : *adj*, unique.
 μοναχώς : *adv*, uniquely.
 μόνος -η -ον : *adj*, alone.
 νοέω, —, νόησα, νενόηκα, νενόημαι, ἐνοήθην : *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.
 ὁμοιος -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 ὄνομάτων, binomial.

- ὁξυγώνιος -ον : *adj*, acute-angled; τὸ ὁξυγώνιον, *no*, acute angle.
- ὁξύς -εῖα -ύ : *adj*, acute.
- ὅποιοσοῦν = ὁ ποῖος -α -ον + οὖν : *adj*, of whatever kind, any kind whatsoever.
- ὅπόσις -η -ον : *pro*, as many, as many as.
- ὅποιοσοῦνδηποτοῦν = ὁ πόσος -η -ον + δή + ποτέ + οὖν : *adj*, of whatever number, any number whatsoever.
- ὅποιοσοῦν = ὁ πόσος -η -ον + οὖν : *adj*, of whatever number, any number whatsoever.
- ὅπότερος -α -ον : *pro*, either (of two), which (of two).
- ὅρθιογώνιον, τό : *no*, rectangle, right-angle.
- ὅρθός -ή -όν : *adj*, straight, right-angled, perpendicular; πρὸς ὅρθὰς γωνίας, at right-angles.
- ὅρος, ὁ : *no*, boundary, definition, term (of a ratio).
- ὅσαδηποτοῦν = ὅσα + δή + ποτέ + οὖν : *ind*, any number whatsoever.
- ὅσάκις : *ind*, as many times as, as often as.
- ὅσαπλάσιος -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, ὁ τι : *pro*, anyone who, anything which.
- ὅταν : *adv*, when, whenever.
- ὅτιοῦν : *ind*, whatsoever.
- οὐδείς, οὐδεμία, οὐδέν : *pro*, not one, nothing.
- οὐδέτερος -α -ον : *pro*, not either.
- οὐδέτερος : see οὐδέτερος.
- οὐδέν : *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 κεῖμαι.
- 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).
- παρατέλυτος -ον : *adj*, penultimate.
- παρέχ : *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.
- πεντεκαδεκάγωνον, τό : *no*, fifteen-sided figure.
- πεπερασμένος -η -ον : *adj*, finite, limited; see περαίνω.
- περαίνω, περανῶ, ἐπέρανα, —, πεπεράσμαι, ἐπερανάνθην : *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 -ή -όν : *adj*, odd.
- περιφέρεια, ἡ : *no*, circumference.
- περιφέρω : *vb*, carry round; see φέρω.
- πηγικότης -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.
- πληθυς -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.
- πρᾶσμα -ατος, τό : *no*, prism.
- προβάνω : *vb*, step forward, advance.
- προδείκνυμι : *vb*, show previously; see δείκνυμι.
- προεκτίθημι : *vb*, set forth beforehand; see τίθημι.
- προερέω : *vb*, say beforehand; *perf pass part*, προειρημένος -η -ον, *adj*, aforementioned; see εἰρῶ.
- προσαναπλήρω : *vb*, fill up, complete.
- προσαναγράφω : *vb*, complete (tracing of); see γράφω.
- προσαρμόζω : *vb*, fit to, attach to.
- προσεκβάλλω : *vb*, produce (a line); see ἐκβάλλω.
- προσευρίσκω : *vb*, find besides, find; see εὑρίσκω.
- προσλαμβάνω : *vb*, add.
- πρόκειμαι : *vb*, set before, prescribe; see κεῖμαι.
- πρόσκειμαι : *vb*, be laid on, have been added to; see κεῖμαι.

- προσπίπτω : *vb*, fall on, fall toward, meet; see πίπτω.
- προτασις -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.
- πρῶτος -α -ον : *adj*, first, prime.
- πυραμίς -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.
- στρέψω, -στρέψω, ἔστρεψα, —, ἔσταμμα, ἔστάφη : *vb*, turn.
- σύγκειμαι : *vb*, lie together, be the sum of, be composed; συγκείμενος -η -ον, *adj*, composed (ratio), compounded; see κείμαι.
- 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.
- συμπληρώω : *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, τά : *no*, two together, in pairs.
- συνεχής -ές : *adj*, continuous; κατὰ τὸ συνεχές, continuously.
- σύνθεσις -εως, ἡ : *no*, putting together, composition.
- σύνθετος -ον : *adj*, composite.
- συνίστημι : *vb*, construct (a figure), set up together; *perf im-perat 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.
- ταράσσω, ταράξω, —, —, τετάραγμα, ἐταράχθη : *vb*, stir, trouble, disturb; τεταραγμένος -η -ον, *adj*, disturbed, perturbed.
- τάσσω, τάξω, ἔταξα, τέταχα, τέταγμα, ἐτάχθη : *vb*, arrange, draw up.
- τέλειος -α -ον : *adj*, perfect.
- τέμνω, τεμνῶ, ἔτεμον, -τέτμηκα, τέτμημα, ἐτμήθη : *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.
- τετράπλευρος -ον : *adj*, quadrilateral.
- τετραπλός -η -ον : *adj*, fourfold.
- τίθημι, θήσω, ἔθηκα, τέθηκα, κεῖμα, ἐτέθη : *vb*, place, put.
- τμῆμα -ατος, τό : *no*, part cut off, piece, segment.
- τοίνυν : *par*, accordingly.
- τοιοῦτος -αύτη -οῦτο : *pro*, such as this.
- τομεύς -έως, ὁ : *no*, sector (of circle).
- τομή, ἡ : *no*, cutting, stump, piece.
- τόπος, ὁ : *no*, place, space.
- τοσαυτάκις : *adv*, so many times.
- τοσαυταπλάσιος -α -ον : *pro*, so many times.
- τοσοῦτος -αύτη -οῦτο : *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, τεύχομαι, ἔτυχον, τετύχηκα, τέτευγμα, ἐτεύχθη : *vb*, hit, happen to be at (a place).
- ὑπάρχω : *vb*, begin, be, exist; see ἀρχω.
- ὑπεξάρεσις -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 κεῖμαι.
- ὑπολείπω : *vb*, leave remaining.
- ὑποτείνω, ὑποτενῶ, ὑπέτεινα, ὑποτέτακα, ὑποτέταμαι, ὑπετάθη : *vb*, subtend.
- ὑψός -εος, τό : *no*, height.
- φανερός -ά -όν : *adj*, visible, manifest.
- φημί, φήσω, ἔφην, —, —, — : *vb*, say; ἔφαμεν, we said.
- φέρω, οἴσω, ἤνεγκον, ἐνήνοχα, ἐνήνεγμα, ἡνέχθη : *vb*, carry.
- χώριον, τό : *no*, place, spot, area, figure.
- χωρίς : *pre + gen*, apart from.
- ψαύω : *vb*, touch.
- ώς : *par*, as, like, for instance.
- ώς ἔτυχεν : *par*, at random.
- ώσαύτως : *adv*, in the same manner, just so.
- ὅστε : *conj*, so that (causal), hence.

