

Fundamentals of Plane Geometry involving Straight-Lines

ΣΤΟΙΧΕΙΩΝ α'.

ELEMENTS BOOK 1

Ὅροι.

Definitions

"lines"



$\alpha = 1$
 $\beta = 2$
 $\gamma = 3$
 $\delta = 4$
 $\epsilon = 5$
 $\varphi = 6$
 $\zeta = 7$
 $\eta = 8$
 $\theta = 9$
 $\iota = 10$

$\kappa\alpha = 11$

$\chi = 20$

α'. Σημεῖόν ἐστιν, οὐ μέρος οὐθέν.
β'. Γραμμὴ δὲ μῆκος ἀπλατές.
γ'. Γραμμῆς δὲ πέρατα σημεῖα.
δ'. Εὐθεῖα γραμμὴ ἐστίν, ἣτις ἐξ ἴσου τοῖς ἐφ' ἑαυτῆς σημεῖοις κεῖται.
ε'. Ἐπιφάνεια δὲ ἐστίν, ὃ μῆκος καὶ πλάτος μόνον ἔχει.
ς'. Ἐπιφανείας δὲ πέρατα γραμμαῖ.
ζ'. Ἐπίπεδος ἐπιφάνειά ἐστίν, ἣτις ἐξ ἴσου ταῖς ἐφ' ἑαυτῆς εὐθειῶν κεῖται.
η'. Ἐπίπεδος δὲ γωνία ἐστίν ἢ ἐν ἐπιπέδῳ δύο γραμμῶν ἀπτομένῳ ἀλλήλαις καὶ μὴ ἐπ' εὐθείας κειμένων πρὸς ἀλλήλας τῶν γραμμῶν κλίσις.
θ'. Ὄταν δὲ αἱ περιέχουσαι τὴν γωνίαν γραμμαῖ εὐθεῖαι ὦσιν, εὐθύγραμμος καλεῖται ἡ γωνία.
ι'. Ὄταν δὲ εὐθεῖα ἐπ' εὐθείαν σταθεῖσα τὰς ἐφεξῆς γωνίας ἴσας ἀλλήλαις ποιῇ, ὀρθὴ ἑκατέρα τῶν ἴσων γωνιῶν ἐστίν, καὶ ἡ ἐφεστηκυῖα εὐθεῖα κάθετος καλεῖται, ἐφ' ἣν ἐφέστηκεν.
ια'. Ἀμβλεῖα γωνία ἐστίν ἢ μείζων ὀρθῆς.
ιβ'. Ὄξεῖα δὲ ἢ ἐλάσσων ὀρθῆς.
ιγ'. Ὅρος ἐστίν, ὃ τινός ἐστι πέρασ.
ιδ'. Σχήμα ἐστὶ τὸ ὑπὸ τινος ἢ τινῶν ὄρων περιεχόμενον.
ιε'. Κύκλος ἐστὶ σχῆμα ἐπίπεδον ὑπὸ μιᾶς γραμμῆς περιεχόμενον [ἢ καλεῖται περιφέρεια], πρὸς ἣν ἀφ' ἐνὸς σημείου τῶν ἐντὸς τοῦ σχήματος κειμένων πᾶσαι αἱ προσπίπτουσαι εὐθεῖαι [πρὸς τὴν τοῦ κύκλου περιφέρειαν] ἴσαι ἀλλήλαις εἰσίν.
ισ'. Κέντρον δὲ τοῦ κύκλου τὸ σημεῖον καλεῖται.
ις'. Διάμετρος δὲ τοῦ κύκλου ἐστίν εὐθεῖα τις διὰ τοῦ κέντρου ἠγμένη καὶ περατουμένη ἐφ' ἑκάτερα τὰ μέρη ὑπὸ τῆς τοῦ κύκλου περιφέρειας, ἣτις καὶ δίχα τέμνει τὸν κύκλον.
ιη'. Ἡμικύκλιον δὲ ἐστὶ τὸ περιεχόμενον σχῆμα ὑπὸ τῆς διαμέτρου καὶ τῆς ἀπολαμβανομένης ὑπ' αὐτῆς περιφέρειας. κέντρον δὲ τοῦ ἡμικυκλίου τὸ αὐτό, ὃ καὶ τοῦ κύκλου ἐστίν.
ιθ'. Σχήματα εὐθύγραμμά ἐστὶ τὰ ὑπὸ εὐθειῶν περιεχόμενα, τρίπλευρα μὲν τὰ ὑπὸ τριῶν, τετράπλευρα δὲ τὰ ὑπὸ τεσσάρων, πολὺπλευρα δὲ τὰ ὑπὸ πλείονων ἢ τεσσάρων εὐθειῶν περιεχόμενα.
κ'. Τῶν δὲ τριπλευρῶν σχημάτων ἰσόπλευρον μὲν τρίγωνόν ἐστὶ τὸ τὰς τρεῖς ἴσας ἔχον πλευράς, ἰσοσκελὲς δὲ τὸ τὰς δύο μόνους ἴσας ἔχον πλευράς, σκαληνὸν δὲ τὸ τὰς τρεῖς ἀνίσους ἔχον πλευράς.
κα' Ἐτι δὲ τῶν τριπλευρῶν σχημάτων ὀρθογώνιον μὲν τρίγωνόν ἐστὶ τὸ ἔχον ὀρθὴν γωνίαν, ἀμβλυγώνιον δὲ τὸ ἔχον ἀμβλεῖαν γωνίαν, ὀξυγώνιον δὲ τὸ τὰς τρεῖς ὀξείας ἔχον γωνίας.

1. A point is that of which there is no part.
2. And a line is a length without breadth.
3. And the extremities of a line are points.
4. A straight-line is (any) one which lies evenly with points on itself.
5. And a surface is that which has length and breadth only.
6. And the extremities of a surface are lines.
7. A plane surface is (any) one which lies evenly with the straight-lines on itself. *in a plane*
8. And a plane angle is the inclination of the lines to one another, when two lines in a plane meet one another, and are not lying in a straight-line.
9. And when the lines containing the angle are straight then the angle is called rectilinear.
10. And when a straight-line stood upon (another) straight-line makes adjacent angles (which are) equal to one another, each of the equal angles is a right-angle, and the former straight-line is called a perpendicular to that upon which it stands.
11. An obtuse angle is one greater than a right-angle.
12. And an acute angle (is) one less than a right-angle.
13. A boundary is that which is the extremity of something.
14. A figure is that which is contained by some boundary or boundaries.
15. A circle is a plane figure contained by a single line [which is called a circumference], (such that) all of the straight-lines radiating towards [the circumference] from one point amongst those lying inside the figure are equal to one another.
16. And the point is called the center of the circle.
17. And a diameter of the circle is any straight-line, being drawn through the center, and terminated in each direction by the circumference of the circle. (And) any such (straight-line) also cuts the circle in half.[†]
18. And a semi-circle is the figure contained by the diameter and the circumference cuts off by it. And the center of the semi-circle is the same (point) as (the center of) the circle. *polygons*
19. Rectilinear figures are those (figures) contained by straight-lines: trilateral figures being those contained by three straight-lines, quadrilateral by four, and multi-lateral by more than four.
20. And of the trilateral figures: an equilateral triangle is that having three equal sides, an isosceles (triangle) that having only two equal sides, and a scalene (triangle) that having three unequal sides.