

ΑΡΙΣΤΑΡΧΟΥ ΠΕΡΙ ΜΕΓΕΘΩΝ ΚΑΙ ΑΠΟΣΤΗΜΑΤΩΝ ΗΛΙΟΥ ΚΑΙ ΣΕΛΗΝΗΣ

(ΥΠΟΘΕΣΕΙΣ)

- α'. Τὴν σελήνην παρὰ τοῦ ἡλίου τὸ φῶς λαμβάνειν.
β'. Τὴν γῆν σημείου τε καὶ κέντρου λόγον ἔχειν πρὸς τὴν τῆς σελήνης σφαῖραν.
γ'. Ὅταν ἡ σελήνη διχότομος ἡμῖν φαίνεται, νεύειν εἰς τὴν ἡμετέραν ὄψιν τὸν διορίζοντα τό τε σκιερὸν καὶ τὸ λαμπρὸν τῆς σελήνης μέγιστον κύκλον.
δ'. Ὅταν ἡ σελήνη διχότομος ἡμῖν φαίνεται, τότε αὐτὴν ἀπέχειν τοῦ ἡλίου ἔλασσον τεταρτεμορίου τῷ τοῦ τεταρτεμορίου τριακοστῷ.
ε'. Τὸ τῆς σκιάς πλάτος σεληνῶν εἶναι δύο.
ς'. Τὴν σελήνην ὑποτείνειν ὑπὸ πεντεκαίδεκατον μέρος ζωδίου.

Ἐπιλογίζεται οὖν τὸ τοῦ ἡλίου ἀπόστημα ἀπὸ τῆς γῆς τοῦ τῆς σελήνης ἀποστήματος μείζον μὲν ἢ ὀκτωκαϊδεκαπλάσιον, ἔλασσον δὲ ἢ εἰκοσαπλάσιον, διὰ τῆς περὶ τὴν διχοτομίαν ὑποθέσεως· τὸν αὐτὸν δὲ λόγον ἔχειν τὴν τοῦ ἡλίου διάμετρον πρὸς τὴν τῆς σελήνης διάμετρον· τὴν δὲ τοῦ ἡλίου διάμετρον πρὸς τὴν τῆς γῆς διάμετρον μείζονα μὲν λόγον ἔχειν ἢ ὄν τὰ ιθ' πρὸς γ', ἐλάσσονα δὲ ἢ ὄν μγ' πρὸς ς', διὰ τοῦ εὑρεθέντος περὶ τὰ ἀποστήματα λόγου, τῆς (τε) περὶ τὴν σκιάν ὑποθέσεως, καὶ τοῦ τὴν σελήνην ὑπὸ πεντεκαίδεκατον μέρος ζωδίου ὑποτείνειν.

Word list:

- μέγεθος, τό, greatness, magnitude (of stars)
ἀπόστημα, -ατος, τό, distance
ἥλιος, ὁ, sun
σελήνη, ἡ, moon
ὑπόθεσις, -εως, ἡ, hypothesis
α'.
φῶς, φωτός, τό, light
λαμβάνω, take, receive (infinitive λαμβάνειν)
β'.
γῆ, γεῶν, ἡ, earth
σημεῖον, τό, sign, mathematical point
κέντρον, τό, sharp point, center of a circle (as if drawn with a compass)
λόγος, ὁ, word, relation, computation, reckoning
ἔχω, have (infinitive ἔχειν)
σφαῖρα, -ας, ἡ, ball, sphere
γ'.
ὅταν, whenever
διχοτόμος, -ον, cut in half
ἡμῖν, to us (dative plural of ἐγώ)
φαῖνω, reveal, shine, appear (present middle subjunctive third person singular φαίνεται)
νεύω, incline, nod, bow (infinitive νεύειν)
ἡμέτερος, -α, -ον, our
ὄψις, ἡ, appearance, sight
διορίζω, separate, distinguish (present active participle διορίζων, -οντος)
σκιερός, -ά, -όν, shady, dark
λαμπρός, -ά, -όν, bright
μέγιστος, -η, -ον, largest, greatest (superlative of μέγας)
κύκλος, ὁ, circle, ring

δ'.

ἀπέχω, keep off, be away from, project, extend, differ (infinitive ἀπέχειν)

ἐλάσσων, -ονος, -ον, less

τεταρτημορίον, τό, fourth part, quarter, quadrant

τριακοστός, -η, -ον, thirtieth

ε'.

σκιά, -ᾶς, ἡ, shadow

πλάτος, -εος, τό, width

εἰμί, to be (infinitive εἶναι)

δύο, two

ζ'.

ὑποτείνω, stretch under, subtend (infinitive ὑποτείνειν)

πεντεκαίδεκατος, -η, -ον, fifteenth

μέρος, -ους, τό, part

ζῳδῖον, τό, sign of the zodiac, small figure

ἐπιλογίζομαι, reckon, conclude (third person singular ἐπιλογίζεται)

οὖν, therefore

μείζων, -ονος, -ον, greater (comparative of μέγας)

ὀκτωκαιδεκαπλάσιος, -α, -ον, eighteenfold

εἰκοσαπλάσιος, -α, -ον, twentyfold

διχοτομία, ἡ, a cutting in half

διάμετρος, ἡ, diameter, diagonal

εὐρίσκω, find (aorist passive participle εὐρεθείς, -έντος)

ARISTARCHUS ON THE SIZES AND DISTANCES OF THE SUN AND MOON

HYPOTHESES

1. That the moon receives light from the sun.
2. That the earth has a relation of both point and center to the sphere [of revolution] of the moon.
3. That whenever the moon appears to us divided in half, the greatest circle separating the shadowed and bright [parts] of the moon inclines to our sight.
4. That whenever the moon appears to us divided in half, then it is away from the sun less than a quadrant by one-thirtieth of a quadrant.
5. That the width of the [earth's] shadow is that of two moons.
6. That the moon subtends a fifteenth part of a sign of the zodiac.

It is therefore concluded that the distance of the sun from the earth is greater than eighteen times, but less than twenty times, the distance of the moon, according to the hypothesis concerning the dividing in half; that the diameter of the sun has the same relationship to the diameter of the moon; and that the diameter of the sun has a relationship to the diameter of the earth greater than that of 19 to 3, but less than that of 43 to 6, according to the relationship which was found concerning the distances, the hypothesis concerning the shadow, and that of the moon subtending a fifteenth part of a sign of the zodiac.