Euclid's Elements Of Geometry

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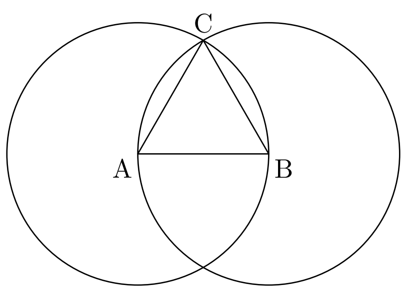
Book 1

Proposition 1

To construct an equilateral triangle on a given finite straight-line.



Let AB be the given finite straight line.

So it is required to contruct an equilateral triangle on the straight-line AB.

Let the circle BCD with center A and radius AB have been drawn, and again let the circle ACE with center B and radius BA have been drawn. And let the straight-lines CA and CB have been joined from the point C, where the circles cut one another, to the points A and B (repsectively). □

Proposition 2

To place a straight-line equal to a given straight-line at a given point (as an extremity). Let A be the given point, BC the given straight-line. So it is required to place a straight-line at point A equal to the given straight-line BC.

For let the straight-line AB have been jointed from point A to point B, and let the euqilateral triangle DAB have been constructed upon it And let the straight-lines AE and BF have been produced in a straight-line with DA and DB (repectively). And let the circle GCH with center B and radius BC have been drawn, and again let the circle GKL with center D and radius DG have been drawn.

Therefore, since the point B is the center (of the circle) GCH, BC is equal to BG. Again, since the point D is the center of the circle GKL, DL is equal to DG. And within these, DA is equal to DB. Thus, the remainder AL is equal to the remainder BG. But BC ws shown (to be) equal to BG. Thus, AL and BC are each euqal to BG. But things equal to the same thing are also equal to one another. Thus, AL is also equal to BC.

Thus, the straight-line AL, equal to the given straight-line BC, has been placed at the point A. (Which is) the very thing it was required to do. $\square$