Euclid's Elements

all thirteen books complete in one volume

The Thomas L. Heath Translation

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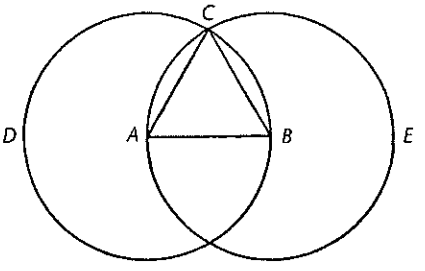
Proposition 1

On a given finite straight line to construct an equilateral triangle.

Let *AB* be the given finite straight line.



Thus it is required to construct an equilateral triangle on the straight line *AB*.
With centre *A* and distance *AB* let the circle *BCD* be described; [Post. 3]
again, with centre *B* and distance *BA* let the circle *ACE* be described; [Post. 3]
and from the point *C*, in which the circles cut one another, to the points *A*, *B* let the straight lines *CA*, *CB* be joined. [Post. 1]

Now, since the point *A* is the centre of the circle *CDB*,
AC is equal to *AB*. [Def. 15]

Again, since the point *B* is the centre of the circle *CAE*,
BC is equal to *BA*. [Def. 15]

But *CA* was also proved equal to *AB*;
therefore each of the straight lines *CA*, *CB* is equal to *AB*.

And things which are equal to the same thing are also equal to one another; [C.N. 1]
therefore CA is also equal to CB.

Therefore the three straight lines *CA*, *AB*, *BC* are equal to one another.

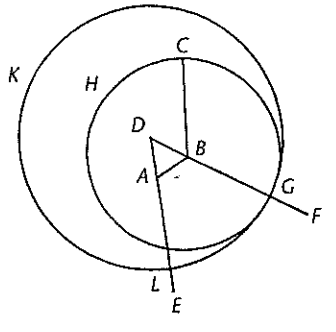
Therefore the triangle *ABC* is equilateral; and it has been constructed on the given finite straight line *AB*.

Being what it was required to do.

Proposition 2

To place at a given point [as an extremity][1] *a straight line equal to a given straight line.*

Let *A* be the given point, and *BC* the given straight line.



Thus it is required to place at the point *A* [as an extremity] a straight line equal to the given straight line *BC*.

From the point *A* to the point *B* let the straight line *AB* be joined; [Post. 1]
and on it let the equilateral triangle *DAB* be constructed. [I. 1]

1. Square brackets indicate material which Heath identified as having been supplied by him, adding clarification but not literally present in the Greek text. —Ed.