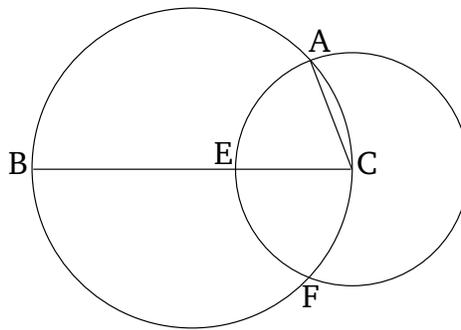


# Book 4

## Proposition 1

To insert a straight-line equal to a given straight-line into a circle, (the latter straight-line) not being greater than the diameter of the circle.

D



Let  $ABC$  be the given circle, and  $D$  the given straight-line (which is) not greater than the diameter of the circle. So it is required to insert a straight-line, equal to the straight-line  $D$ , into the circle  $ABC$ .

Let a diameter  $BC$  of circle  $ABC$  have been drawn. Therefore, if  $BC$  is equal to  $D$  then that (which) was prescribed has taken place. For the (straight-line)  $BC$ , equal to the straight-line  $D$ , has been inserted into the circle  $ABC$ . And if  $BC$  is greater than  $D$  then let  $CE$  be made equal to  $D$  [Prop. 1.3], and let the circle  $EAF$  have been drawn with center  $C$  and radius  $CE$ . And let  $CA$  have been joined.

Therefore, since the point  $C$  is the center of circle  $EAF$ ,  $CA$  is equal to  $CE$ . But,  $CE$  is equal to  $D$ . Thus,  $D$  is also equal to  $CA$ .

Thus,  $CA$ , equal to the given straight-line  $D$ , has been

inserted into the given circle  $ABC$ . (Which is) the very thing it was required to do.