

## Book 3

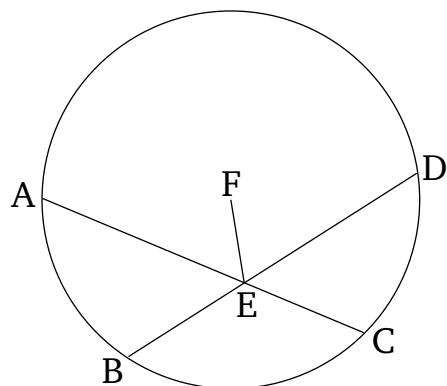
### Proposition 4

In a circle, if two straight-lines, which are not through the center, cut one another then they do not cut one another in half.

Let  $ABCD$  be a circle, and within it, let two straight-lines,  $AC$  and  $BD$ , which are not through the center, cut one another at (point)  $E$ . I say that they do not cut one another in half.

For, if possible, let them cut one another in half, such that  $AE$  is equal to  $EC$ , and  $BE$  to  $ED$ . And let the center of the circle  $ABCD$  have been found [Prop. 3.1], and let it be (at point)  $F$ , and let  $FE$  have been joined.

Therefore, since some straight-line through the center,  $FE$ , cuts in half some straight-line not through the center,  $AC$ , it also cuts it at right-angles [Prop. 3.3]. Thus,  $FEA$  is a right-angle. Again, since some straight-line  $FE$  cuts in half some straight-line  $BD$ , it also cuts it at right-angles [Prop. 3.3]. Thus,  $FEB$  (is) a right-angle. But  $FEA$  was also shown (to be) a right-angle. Thus,  $FEA$  (is) equal to  $FEB$ , the lesser to the greater. The very thing is impossible. Thus,  $AC$  and  $BD$  do not cut one another in half.



Thus, in a circle, if two straight-lines, which are not through the center, cut one another then they do not cut one another in half. (Which is) the very thing it was required to show.