

Book 3

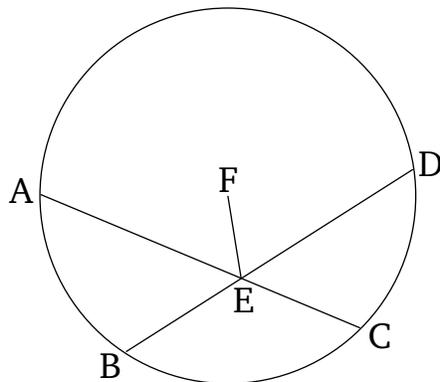
Proposition 4

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.