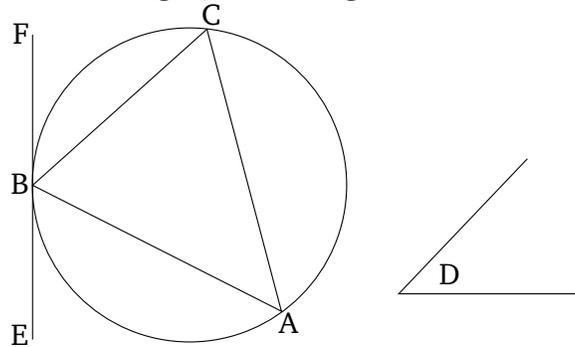


## Book 3

### Proposition 34

To cut off a segment, accepting an angle equal to a given rectilinear angle, from a given circle.



Let  $ABC$  be the given circle, and  $D$  the given rectilinear angle. So it is required to cut off a segment, accepting an angle equal to the given rectilinear angle  $D$ , from the given circle  $ABC$ .

Let  $EF$  have been drawn touching  $ABC$  at point  $B$ .<sup>†</sup> And let (angle)  $FBC$ , equal to angle  $D$ , have been constructed on the straight-line  $FB$ , at the point  $B$  on it [Prop. 1.23].

Therefore, since some straight-line  $EF$  touches the circle  $ABC$ , and  $BC$  has been drawn across (the circle) from the point of contact  $B$ , angle  $FBC$  is thus equal to the angle constructed in the alternate segment  $BAC$  [Prop. 1.32]. But,  $FBC$  is equal to  $D$ . Thus, the (angle) in the segment  $BAC$  is also equal to [angle]  $D$ .

Thus, the segment  $BAC$ , accepting an angle equal to the given rectilinear angle  $D$ , has been cut off from the given circle  $ABC$ . (Which is) the very thing it was required to do.