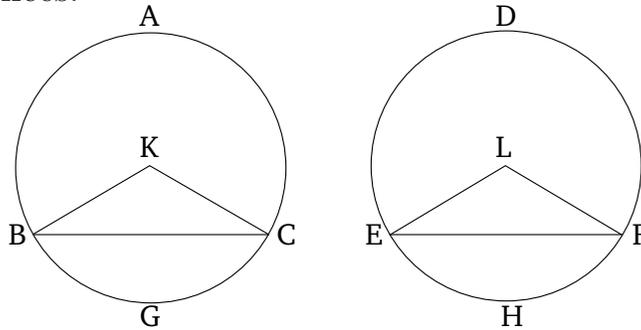


## Book 3 Proposition 29

In equal circles, equal straight-lines subtend equal circumferences.



Let  $ABC$  and  $DEF$  be equal circles, and within them let the equal circumferences  $BGC$  and  $EHF$  have been cut off. And let the straight-lines  $BC$  and  $EF$  have been joined. I say that  $BC$  is equal to  $EF$ .

For let the centers of the circles have been found [Prop. 3.1], and let them be (at)  $K$  and  $L$ . And let  $BK$ ,  $KC$ ,  $EL$ , and  $LF$  have been joined.

And since the circumference  $BGC$  is equal to the circumference  $EHF$ , the angle  $BKC$  is also equal to (angle)  $ELF$  [Prop. 3.27]. And since the circles  $ABC$  and  $DEF$  are equal, their radii are also equal [Def. 3.1]. So the two (straight-lines)  $BK$ ,  $KC$  are equal to the two (straight-lines)  $EL$ ,  $LF$  (respectively). And they contain equal angles. Thus, the base  $BC$  is equal to the base  $EF$  [Prop. 1.4].

Thus, in equal circles, equal straight-lines subtend equal circumferences. (Which is) the very thing it was required to show.