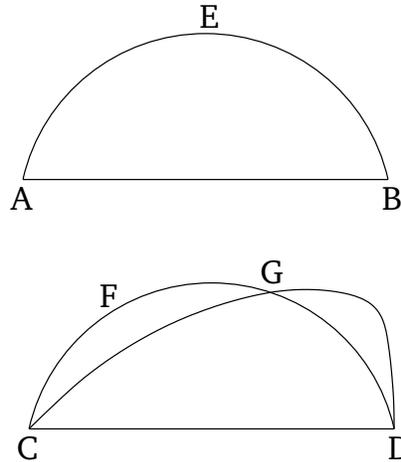


## Book 3

### Proposition 24

Similar segments of circles on equal straight-lines are equal to one another.



For let  $AEB$  and  $CFD$  be similar segments of circles on the equal straight-lines  $AB$  and  $CD$  (respectively). I say that segment  $AEB$  is equal to segment  $CFD$ .

For if the segment  $AEB$  is applied to the segment  $CFD$ , and point  $A$  is placed on (point)  $C$ , and the straight-line  $AB$  on  $CD$ , then point  $B$  will also coincide with point  $D$ , on account of  $AB$  being equal to  $CD$ . And if  $AB$  coincides with  $CD$  then the segment  $AEB$  will also coincide with  $CFD$ . For if the straight-line  $AB$  coincides with  $CD$ , and the segment  $AEB$  does not coincide with  $CFD$ , then it will surely either fall inside it, outside (it),<sup>†</sup> or it will miss like  $CGD$  (in the figure), and a circle (will) cut (another) circle at more than two points. The very thing is impossible [Prop. 3.10]. Thus, if the straight-line  $AB$  is applied to  $CD$ , the segment  $AEB$  cannot not also coincide with  $CFD$ . Thus, it will

coincide, and will be equal to it [C.N. 4].

Thus, similar segments of circles on equal straight-lines are equal to one another. (Which is) the very thing it was required to show.