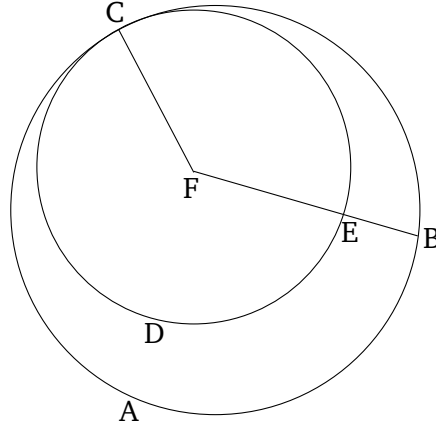


## Book 3

### Proposition 6

If two circles touch one another then they will not have the same center.



For let the two circles  $ABC$  and  $CDE$  touch one another at point  $C$ . I say that they will not have the same center.

For, if possible, let  $F$  be (the common center), and let  $FC$  have been joined, and let  $FEB$  have been drawn through (the two circles), at random.

Therefore, since point  $F$  is the center of the circle  $ABC$ ,  $FC$  is equal to  $FB$ . Again, since point  $F$  is the center of the circle  $CDE$ ,  $FC$  is equal to  $FE$ . But  $FC$  was shown (to be) equal to  $FB$ . Thus,  $FE$  is also equal to  $FB$ , the lesser to the greater. The very thing is impossible. Thus, point  $F$  is not the (common) center of the circles  $ABC$  and  $CDE$ .

Thus, if two circles touch one another then they will not have the same center. (Which is) the very thing it was required to show.