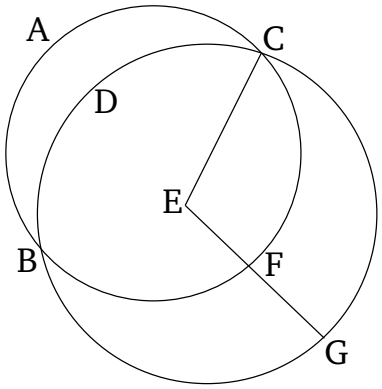
Book 3
Proposition 5

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



For let the two circles ABC and CDG cut one another at points B and C. I say that they will not have the same center.

For, if possible, let E be (the common center), and let EC have been joined, and let EFG have been drawn through (the two circles), at random. And since point E is the center of the circle ABC, EC is equal to EF. Again, since point E is the center of the circle CDG, EC is equal to EG. But EC was also shown (to be) equal to EF. Thus, EF is also equal to EG, the lesser to the greater. The very thing is impossible. Thus, point E is not the (common) center of the circles ABC and CDG.

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