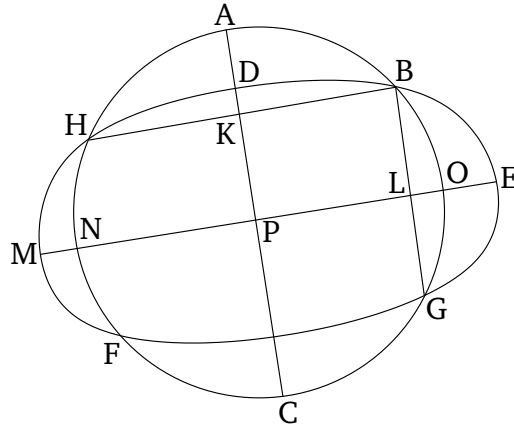


Book 3

Proposition 10

A circle does not cut a(nother) circle at more than two points.

For, if possible, let the circle ABC cut the circle DEF at more than two points, B , G , F , and H . And BH and BG being joined, let them (then) have been cut in half at points K and L (respectively). And KC and LM being drawn at right-angles to BH and BG from K and L (respectively) [Prop. 1.11], let them (then) have been drawn through to points A and E (respectively).



Therefore, since in circle ABC some straight-line AC cuts some (other) straight-line BH in half, and at right-angles, the center of circle ABC is thus on AC [Prop. 3.1 corr.]. Again, since in the same circle ABC some straight-line NO cuts some (other straight-line) BG in half, and at right-angles, the center of circle ABC is thus on NO [Prop. 3.1 corr.]. And it was also shown (to be) on AC . And the straight-lines AC and NO meet at no other (point) than P . Thus, point P is the center of circle ABC . So, similarly, we can show that P is also the cen-

ter of circle DEF . Thus, two circles cutting one another, ABC and DEF , have the same center P . The very thing is impossible [Prop. 3.5].

Thus, a circle does not cut a(nother) circle at more than two points. (Which is) the very thing it was required to show.