

Book 3

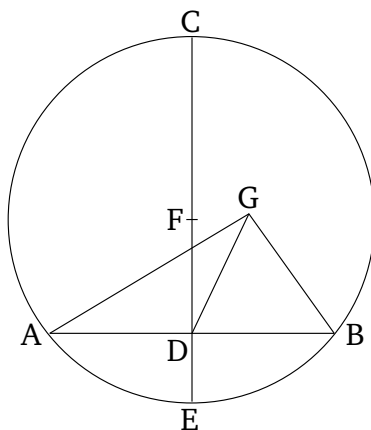
Proposition 1

To find the center of a given circle.

Let ABC be the given circle. So it is required to find the center of circle ABC .

Let some straight-line AB have been drawn through (ABC), at random, and let (AB) have been cut in half at point D [Prop. 1.9]. And let DC have been drawn from D , at right-angles to AB [Prop. 1.11]. And let (CD) have been drawn through to E . And let CE have been cut in half at F [Prop. 1.9]. I say that (point) F is the center of the [circle] ABC .

For (if) not then, if possible, let G (be the center of the circle), and let GA , GD , and GB have been joined. And since AD is equal to DB , and DG (is) common, the two (straight-lines) AD , DG are equal to the two (straight-lines) BD , DG , respectively. And the base GA is equal to the base GB . For (they are both) radii. Thus, angle ADG is equal to angle GDB [Prop. 1.8]. And when a straight-line stood upon (another) straight-line make adjacent angles (which are) equal to one another, each of the equal angles is a right-angle [Def. 1.10]. Thus, GDB is a right-angle. And FDB is also a right-angle. Thus, FDB (is) equal to GDB , the greater to the lesser. The very thing is impossible. Thus, (point) G is not the center of the circle ABC . So, similarly, we can show that neither is any other (point) except F .



Thus, point F is the center of the [circle] ABC .

Corollary

So, from this, (it is) manifest that if any straight-line in a circle cuts any (other) straight-line in half, and at right-angles, then the center of the circle is on the former (straight-line). — (Which is) the very thing it was required to do.