

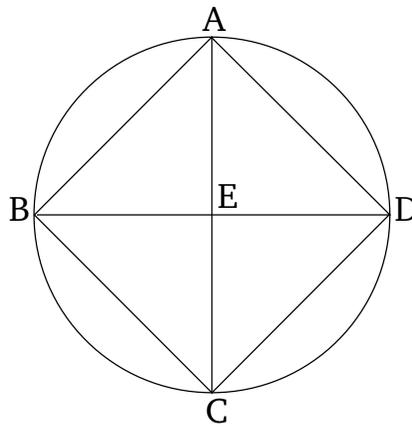
Book 4

Proposition 9

To circumscribe a circle about a given square.

Let $ABCD$ be the given square. So it is required to circumscribe a circle about square $ABCD$.

AC and BD being joined, let them cut one another at E .



And since DA is equal to AB , and AC (is) common, the two (straight-lines) DA , AC are thus equal to the two (straight-lines) BA , AC . And the base DC (is) equal to the base BC . Thus, angle DAC is equal to angle BAC [Prop. 1.8]. Thus, the angle DAB has been cut in half by AC . So, similarly, we can show that ABC , BCD , and CDA have each been cut in half by the straight-lines AC and DB . And since angle DAB is equal to ABC , and EAB is half of DAB , and EBA half of ABC , EAB is thus also equal to EBA . So that side EA is also equal to EB [Prop. 1.6]. So, similarly, we can show that each of the [straight-lines] EA and EB are also equal to each of EC and ED . Thus, the four (straight-lines) EA , EB , EC , and ED are equal to one another. Thus, the circle

drawn with center E , and radius one of A , B , C , or D , will also go through the remaining points, and will have been circumscribed about the square $ABCD$. Let it have been (so) circumscribed, like $ABCD$ (in the figure).

Thus, a circle has been circumscribed about the given square. (Which is) the very thing it was required to do.