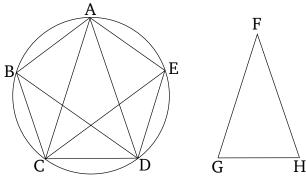
Book 4 Proposition 11

To inscribe an equilateral and equiangular pentagon in a given circle.



Let ABCDE be the given circle. So it is required to inscribed an equilateral and equiangular pentagon in circle ABCDE.

Let the the isosceles triangle FGH be set up having each of the angles at G and H double the (angle) at F [Prop. 4.10]. And let triangle ACD, equiangular to FGH, have been inscribed in circle ABCDE, such that CAD is equal to the angle at F, and the (angles) at G and H (are) equal to ACD and CDA, respectively [Prop. 4.2]. Thus, ACD and CDA are each double CAD. So let ACD and CDA have been cut in half by the straight-lines CE and DB, respectively [Prop. 1.9]. And let AB, BC, DE and EA have been joined.

Therefore, since angles ACD and CDA are each double CAD, and are cut in half by the straight-lines CE and DB, the five angles DAC, ACE, ECD, CDB, and BDA are thus equal to one another. And equal angles stand upon equal circumferences [Prop. 3.26]. Thus,

the five circumferences AB, BC, CD, DE, and EA are equal to one another [Prop. 3.29]. Thus, the pentagon ABCDE is equilateral. So I say that (it is) also equiangular. For since the circumference AB is equal to the circumference DE, let BCD have been added to both. Thus, the whole circumference ABCD is equal to the whole circumference EDCB. And the angle AED stands upon circumference EDCB. And angle BAE upon circumference EDCB. Thus, angle BAE is also equal to AED [Prop. 3.27]. So, for the same (reasons), each of the angles ABC, BCD, and CDE is also equal to each of BAE and AED. Thus, pentagon ABCDE is equiangular. And it was also shown (to be) equilateral.

Thus, an equilateral and equiangular pentagon has been inscribed in the given circle. (Which is) the very thing it was required to do.