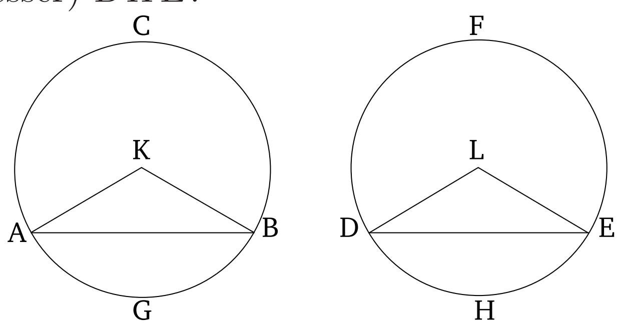
Book 3
Proposition 28

In equal circles, equal straight-lines cut off equal circumferences, the greater (circumference being equal) to the greater, and the lesser to the lesser.

Let ABC and DEF be equal circles, and let AB and DE be equal straight-lines in these circles, cutting off the greater circumferences ACB and DFE, and the lesser (circumferences) AGB and DHE (respectively). I say that the greater circumference ACB is equal to the greater circumference DFE, and the lesser circumference AGB to (the lesser) DHE.



For let the centers of the circles, K and L, have been found [Prop. 3.1], and let AK, KB, DL, and LE have been joined.

And since (ABC and DEF) are equal circles, their radii are also equal [Def. 3.1]. So the two (straight-lines) AK, KB are equal to the two (straight-lines) DL, LE (respectively). And the base AB (is) equal to the base DE. Thus, angle AKB is equal to angle DLE [Prop. 1.8]. And equal angles stand upon equal circumferences, when they are at the centers [Prop. 3.26]. Thus, circumference AGB (is) equal to DHE. And the whole circle ABC is also equal to the whole circle DEF. Thus, the remaining circumference ACB is also equal to the remaining circumference DFE.

Thus, in equal circles, equal straight-lines cut off equal circumferences, the greater (circumference being equal) to the greater, and the lesser to the lesser. (Which is) the very thing it was required to show.