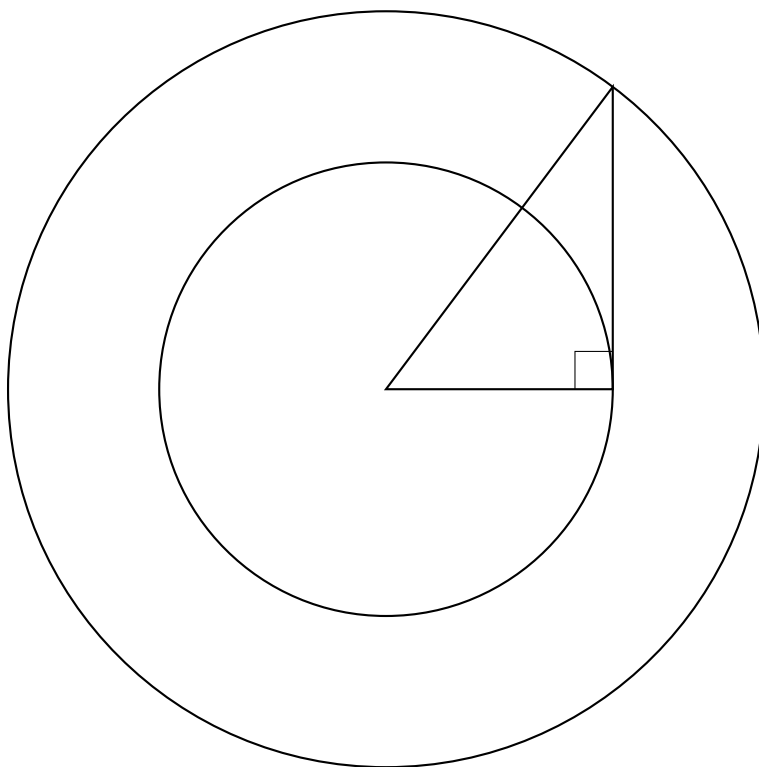


Fact 1: Using the Pythagorean Theorem, for any α we have that $\alpha a^2 + \alpha b^2 = \alpha c^2$. In particular, if $\alpha = \pi$ then we have a relationship between areas of circles with radii which form a right triangle.

Fact 2: Using the geometry of the problem we have the following right triangle with side lengths equal to the radius of the inner circle, the radius of the outer circle, and $T/2$.



Let A = area of the annulus, A_o = area of the outer circle, and A_i = area of the inner circle. Using Fact 1 we have

$$\begin{aligned} A &= A_o - A_i \\ &= \text{area of a circle with radius } T/2 \\ &= \frac{\pi}{4} T^2. \end{aligned}$$