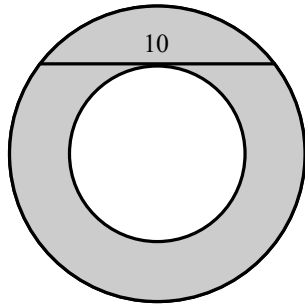

Problem of the Week

Number Six

October 16, 2017

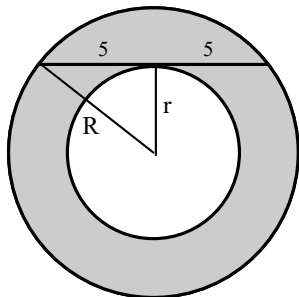
In the pair of concentric circles shown below, a chord of the larger circle is drawn tangent to the smaller circle. This chord has length ten. Find the area of the annulus (shaded gray in the diagram).



SOLUTION: The area is 25π .

If the radius of the big circle is denoted by R , and the radius of the small circle is denoted by r , then the area of the annulus is $\pi(R^2 - r^2)$.

The two radii are shown in the figure below.



The small radius bisects the chord, by results from elementary geometry. Now, by the Pythagorean theorem we can see that

$$R^2 - r^2 = 25.$$

Multiplying this by π now gives the answer.

It is interesting to note that the problem does not give sufficient information to determine either of the radii. Happily, this information is not necessary to solve the problem.