Circles and Other Shapes, continued

4. Given a circle with radius 5 and a square with the vertices of the square all on the circle. Find the ratio of the area of the square to the area of the circle. Sketch a picture and record the ratio.

Next create another circle and square with different radius. Again compute the ratio of areas. Make a conjecture and create an argument to support your conjecture.

5. Given a circle with radius 5 units. Create a square so that the circle is tangent to all 4 sides of the square. Create a second square whose 4 vertices are on the circle. Determine the areas of these squares. What is the ratio of these areas?

Repeat this with a circle of radius 10 and compute the areas of these new squares. How does this new ratio (area of inscribed square to area of circumscribed square) compare to the previous example?

What if the circle had a radius of \( r \) units? How do you think the ratio between the areas of the smaller inscribed square and the circumscribed square would compare to the previous examples? Explain your thinking.