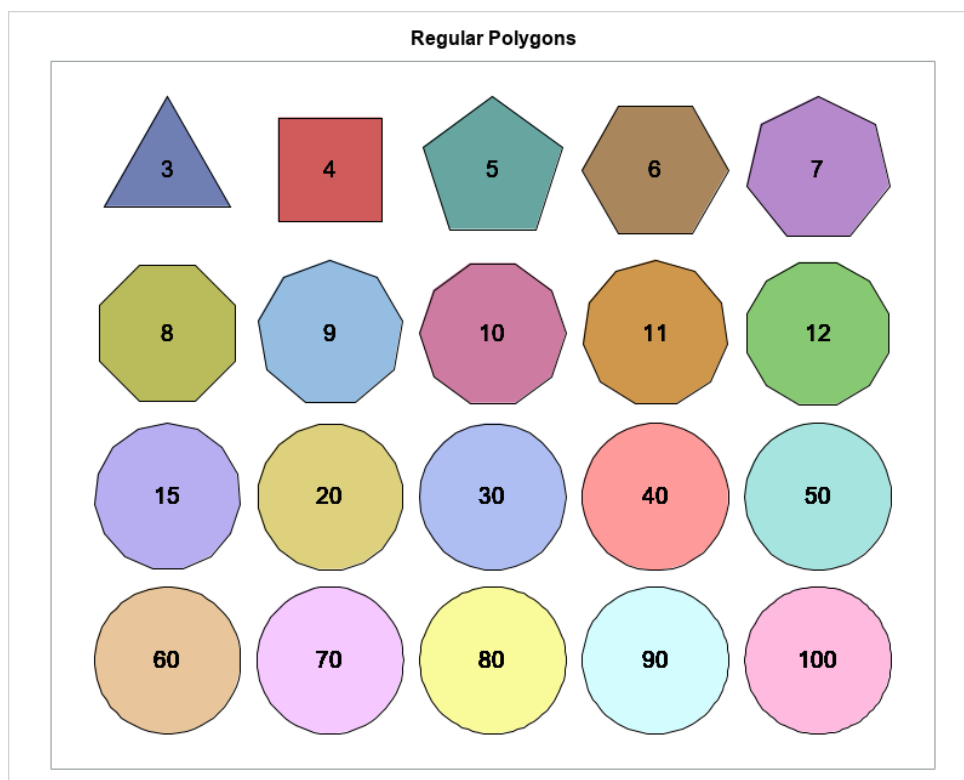


**Evaluate the area of polygons with {6, 12, 24, 128, 256, 512, 1024, 2048, 65536} sides with a few different side lengths and compare that to the area of a circle with the same radius as those polygons. What are your observations?**

As you increase the number of sides of an inscribed polygon, the area nears closer to the area of the respective circle for each polygon. For example, a polygon with 6 sides is about 83% of a circle with the same radius for side lengths of 1,2 and 3. A polygon with 12 sides was about 95% of its respective circle, and a polygon with 24 sides was an even higher nearly 99% of its respective circle. A polygon with 65536 sides was as close as ~99.999999% of its respective circle. As a polygon has more and more sides, it approaches a more spherical shape, and there is less space in between each side and the perimeter of the circle.

For example, I found this graphic that shows polygons with an increasing number of sides. For a triangle, it seems as if a circle around it with points at the vertices of the polygon would not have a similar area to the original shape. With each progressive addition of sides, the shape more closely resembles a circle.



<https://blogs.sas.com/content/iml/2020/03/11/polygons-pi-linear-approx.html>