ESSENTIAL QUESTION(S): What are concentric circles? What are the 5 types of lines we can construct inside of a circle? What is the difference between a central angle and an inscribed angle?

NOTES:
Example 1:

A. Are Circle A and Circle B similar? Why or why not?

Yes; all circles are similar
*Same shape, different radius.

B. Without knowing any measures, what is the scale factor between Circle A and Circle B?

\[
\text{Scale Factor} = \frac{r_2}{r_1} \quad \text{(Image to Pre-Image)}
\]

C. Using a straight-edge, find the center of dilation between the two circles by constructing one secant line and one additional tangent line. Label all points where your guiding lines intersect the circles. Identify your secant and tangent lines below.

D. Using only points, construct all similar segments and polygons inside your circles. Be sure to construct and identify at least three central angles and three inscribed angles.

*\( \angle RAK, \angle KAM, / \angle QPD, \angle LPD, \angle CAM \)

E. In the space below, identify at least five proportional segments and use them to create a proportionality statement.

\[
\frac{RK}{LQ} = \frac{KA + QB}{CM - DP}, \frac{RM}{LP}, \frac{RA}{LB}
\]

F. Identify any special triangles (isosceles or right) that you constructed in your circles. How do you know they are this type of triangle?

*\( \Delta RAK, \Delta MAC, \Delta KAC \) (and their similar triangles in OB)

*Right Triangles (inscribed angles are 90° their arc → semicircle)

*Isosceles Triangles (radii of the circle)
Example 2:

A. Consider the following proportion:

\[
\frac{\text{Circumference of } A}{\text{Diameter of } A} = \frac{\text{Circumference of } B}{\text{Diameter of } B}
\]

Is this true? Why or why not?

\[
\frac{2\pi r_1}{2r_1} = \frac{2\pi r_2}{2r_2}
\]

\[\downarrow\]

\[
\pi = \pi
\]

\[\star \text{yes! ratios are the same.}\]

B. Consider the following proportion:

\[
\frac{\text{Area of } A}{\text{Area of } B} = \frac{\text{Circumference of } A}{\text{Circumference of } B}
\]

Is this true? Why or why not?

\[
\frac{\pi r_1^2}{\pi r_2^2} = \frac{2\pi r_1}{2\pi r_2}
\]

\[
\frac{r_1^2}{r_2^2} = \frac{r_1}{r_2}
\]

\[\star \text{no! dimensions aren't the same.}\]