Day 8: Archimedes Spirals

Archimedes' Area Spirals

Materials:

- string
- 1 sheet with one circles, each with one radius marked
- scissors
- two-sided tape or glue

Instructions

1. Cut out your circle and place glue or two-sided tape along the radius of your circle.

2. Starting at the centre of your circle and spiraling out, fill the area of the circle with string.

3. Starting at the point where your string ended, cut to the centre of your circle.

4. Unroll the longest string so it lays flat, perpendicular to the radius that was marked on your circle. What is the special name for the length of this string? Write an algebraic expression for the length of the string.

5. Unroll the rest of the string so it lays flat on the base you have made. What shape do you have? What is the height of the shape? Write an algebraic expression for the height of the shape.

6. Using the algebraic expressions for the base and the height you found in #4 & #5, find the area of this shape.

7. Explain why the area you found in #6 is the actual area of the circle.

8. Explain how this activity shows the relationship between the area and circumference formulae for a circle.

Day 8: Conclusions

Conclusions:

1. In the past couple of weeks, you have seen many different demonstrations of the formulas for circumference. Explain why the circumference formula is $C = \pi d$ or $C = 2\pi r$.

2. In the past couple of weeks you have seen at least 3 different demonstrations why πr^2 is the formula for the area of a circle. Explain why the area formula for a circle is $A = \pi r^2$.

3. Throughout the instruction we shared some historical stories about Archimedes and his methods of approximating π. What is your opinion on the history of math used in a math class?

4. What has been the value of the last unit to you?