

The Area of a Circle

“A bell cannot tell time, but it can be moved in just such a way as to say twelve o’clock.

Similarly, we cannot calculate infinite numbers, but we can be moved in just such a way as to say π .”

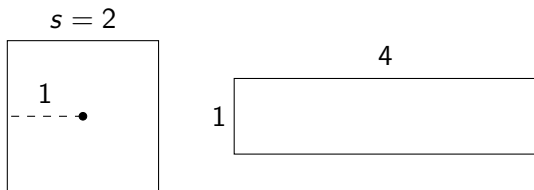
– Daniel Tammet

Today's Questions.

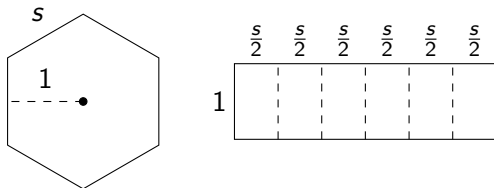
- What is the area of a circle?

Think - Pair - Share.

Without any words or algebra, demonstrate that the two regions below have the same area.

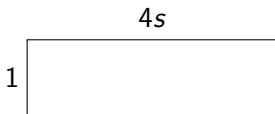
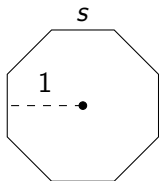


Without any words or algebra, demonstrate that the two regions below have the same area.

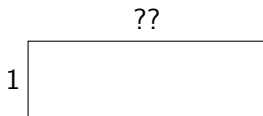
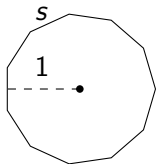


Think - Pair - Share.

Without any words or algebra, demonstrate that the two regions below have the same area.

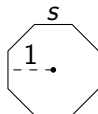
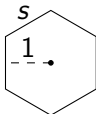


Can you describe a general relationship between the perimeter of an n -sided regular polygon and a rectangle of height equal to 1?

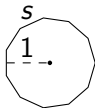


Partners.

- 1 Use trigonometry to solve for s in each of the following figures.



- 2 Find a formula for s , the side length of a regular polygon with n sides.
- 3 We saw that a regular polygon with n sides and “radius” 1 has area, $A = n \cdot s/2$.



$$1 \left[\begin{array}{c} n \cdot s/2 \\ \hline \end{array} \right]$$

Write a formula for A in terms of n using your answer to (2).

- 4 **Challenge:** Evaluate the limit: $\lim_{n \rightarrow \infty} A$

Today's Questions.

- What is the area of a circle?
- Why do I care?