## Unit 4 Lesson 11: Approximating Pi

### 1 More Sides (Warm up)

#### Student Task Statement





Calculate the area of the shaded regions.

### 2 N Sides

#### Student Task Statement

Here is one part of a regular $n$-sided polygon inscribed in a circle of radius 1.

Come up with a general formula for the perimeter of the polygon in terms of $n$.  Explain or show your reasoning.



### 3 So Many Sides

#### Student Task Statement

Let's use the expression you came up with to approximate the value of $π$.

1. How close is the approximation when $n=6$?
2. How close is the approximation when $n=10$?
3. How close is the approximation when $n=20$?
4. How close is the approximation when $n=50$?
5. What value of $n$ approximates the value of $π$ to the thousandths place?

#### Images for Activity Synthesis







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