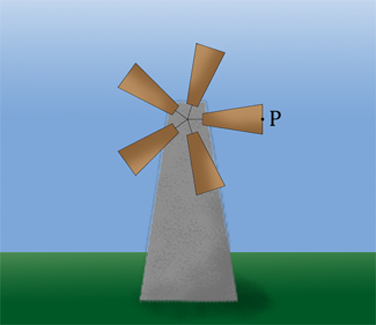
## Unit 6 Lesson 11: Extending the Domain of Trigonometric Functions

### 1 Rewind to the Windmill (Warm up)

#### Images for Launch



#### Student Task Statement

Priya is thinking about the windmill in an earlier lesson. That windmill had a point at at the end of the blade that starts at 0 radians pointing directly to the right. Priya says that if the blade rotates radians, then will be at the lowest point in its circle of rotation.

What do you think Priya means by rotating radians? Do you agree with Priya? Be prepared to explain your reasoning.

### 2 Math Talk: The Hour Hand

#### Student Task Statement

Here is a clock showing an hour hand at 3 p.m.



Your teacher will give you a time. Identify the radian angle measure that the hour hand rotates through if it starts at 3 p.m.

### 3 The Big Picture for Cosine and Sine

#### Student Task Statement

1. Create a visual display for the following functions. Include a graph of the function from at least to  radians, the maximum and minimum value of the function, and the period of the function. Label any intersections the graph of the function has with the axes.
2. The -axis is a line of symmetry for one of the two graphs. Which one? Explain how you know.

### 4 Cosine and Sine Together (Optional)

#### Student Task Statement

Use graphing technology to graph the functions and  on the same axes.

1. Identify two points where the graphs intersect—one with a negative -coordinate, and one with a positive -coordinate. What is the exact -coordinate for each point? Explain or show how you know.
2. What are the -coordinates of the points of intersection? Explain or show how you know.
3. What could be the value of if ? Explain your reasoning.

#### Activity Synthesis





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