

## Lesson 13 Practice Problems

1. For each trigonometric function, indicate the amplitude and midline.

a.  $y = 2 \sin(\theta)$

b.  $y = \cos(\theta) - 5$

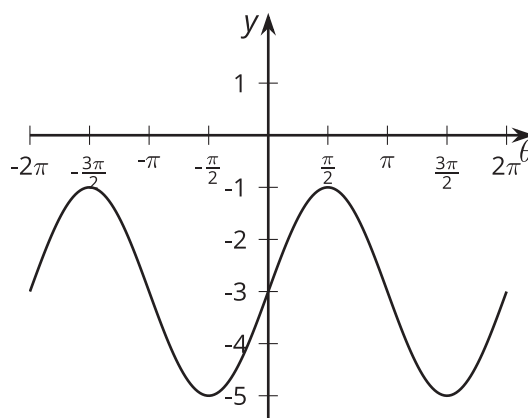
c.  $y = 1.4 \sin(\theta) + 3.5$

2. Here is a graph of the equation

$$y = 2 \sin(\theta) - 3.$$

a. Indicate the midline on the graph.

b. Use the graph to find the amplitude of this sine equation.



3. Select **all** trigonometric functions with an amplitude of 3.

A.  $y = 3 \sin(\theta) - 1$

B.  $y = \sin(\theta) + 3$

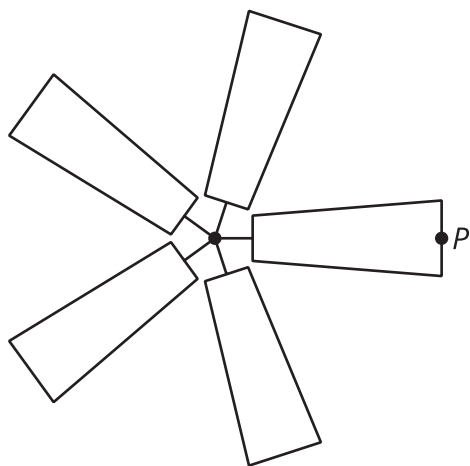
C.  $y = 3 \cos(\theta) + 2$

D.  $y = \cos(\theta) - 3$

E.  $y = 3 \sin(\theta)$

F.  $y = \cos(\theta - 3)$

4. The center of a windmill is 20 feet off the ground and the blades are 10 feet long.



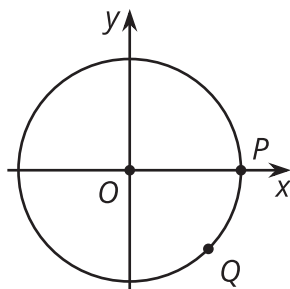
rotation angle of windmill	vertical position of $P$ in feet
$\frac{\pi}{6}$	
$\frac{\pi}{3}$	
$\frac{\pi}{2}$	
$\pi$	
$\frac{3\pi}{2}$	

- Fill out the table showing the vertical position of  $P$  after the windmill has rotated through the given angle.
- Write an equation for the function  $f$  that describes the relationship between the angle of rotation  $\theta$  and the vertical position of the point  $P$ ,  $f(\theta)$ , in feet.

5. The measure of angle  $\theta$ , in radians, satisfies  $\sin(\theta) < 0$ . If  $\theta$  is between 0 and  $2\pi$  what can you say about the measure of  $\theta$ ?

(From Unit 6, Lesson 9.)

6. Which rotations, with center  $O$ , take  $P$  to  $Q$ ? Select **all** that apply.

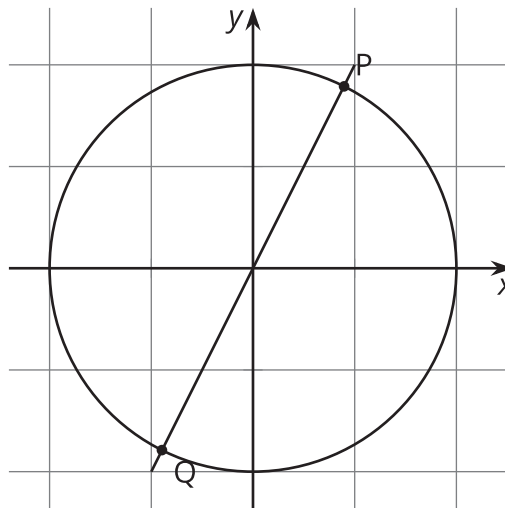


- A.  $\frac{3\pi}{4}$  radians
- B.  $\frac{15\pi}{4}$  radians
- C.  $\frac{7\pi}{4}$  radians
- D.  $\frac{11\pi}{4}$  radians
- E.  $\frac{23\pi}{4}$  radians

(From Unit 6, Lesson 10.)

7. The picture shows two points  $P$  and  $Q$  on the unit circle.

Explain why the tangent of  $P$  and  $Q$  is 2.



(From Unit 6, Lesson 12.)