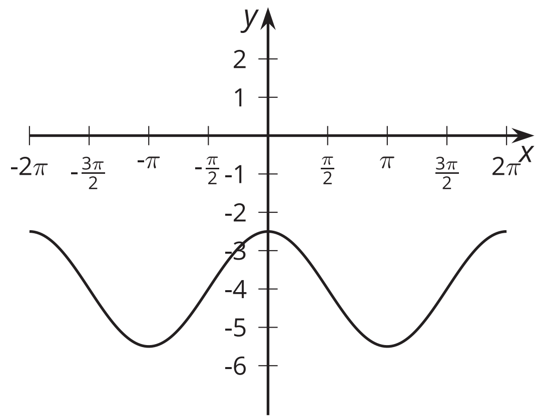
Lesson 15 Practice Problems

1. Here is a graph of a trigonometric function. Which equation could define this function?



A. $y = 1.5\sin(x) - 4$

B. $y = 1.5\cos(x) - 4$

C. $y = -4\sin(1.5x)$

D. $y = -4\cos(1.5x)$

2. Select **all** the functions that have period π.

A. $y = \cos\left(\frac{x}{2}\right)$

B. $y = \sin\left(\frac{x}{2}\right)$

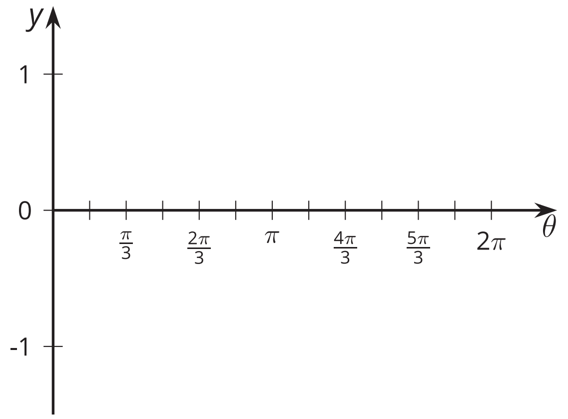
C. $y = \cos(x)$

D. $y = \cos(2x)$

E. $y = \sin(2x)$

3. a. Sketch a graph of $a(\theta) = \cos(3\theta)$.

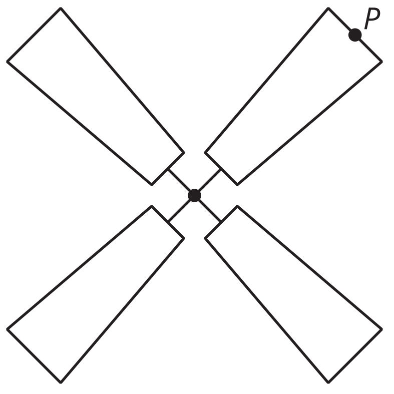
   b. Compare the graph of a to the graph of $b(\theta) = \cos(\theta)$. How are the two graphs alike? How are they different?



4. The functions f and g are given by $f(x) = \cos(x)$ and $g(x) = \cos(5x)$. How are the graphs of f and g related?

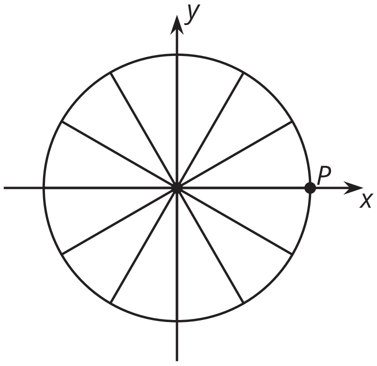
5. Here is a point at the tip of a windmill blade. The center of the windmill is 6 feet off the ground and the blades are 1.5 feet long.

   Write an equation giving the height h of the point P after the windmill blade rotates by an angle of a. Point P is currently rotated $\frac{\pi}{4}$ radians from the point directly to the right of the center of the windmill.



(From Unit 6, Lesson 14.)

6. The coordinates of P are $(1, 0)$.



a. If the wheel makes a $\frac{1}{3}$ rotation counterclockwise around its center, what radian angle does P rotate through?

b. If the wheel makes a $1\frac{1}{4}$ rotation counterclockwise around its center, what radian angle does P rotate through?

(From Unit 6, Lesson 3.)

7. A Ferris wheel has a radius of 95 feet and its center is 105 feet above the ground. Which statement is true about a point on the Ferris wheel as it goes around in a circle?

A. It is 85 feet off the ground once in quadrant 1 and once in quadrant 2.

B. It is is 85 feet off the ground once in quadrant 2 and once in quadrant 3.

C. It is 85 feet off the ground once in quadrant 3 and once in quadrant 4.

D. It is 85 feet off the ground once in quadrant 4 and once in quadrant 1.

(From Unit 6, Lesson 7.)