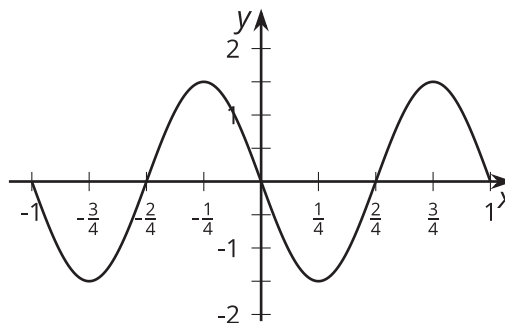


Lesson 17 Practice Problems

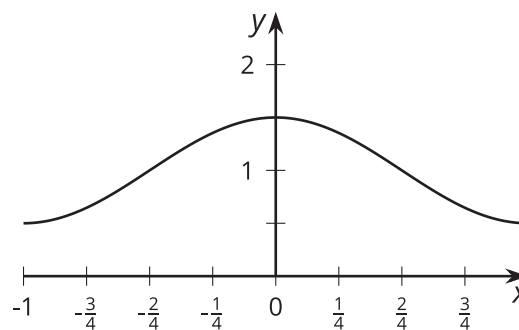
1. Here is the graph of a trigonometric function.

Which equation has this graph? Select **all** that apply.



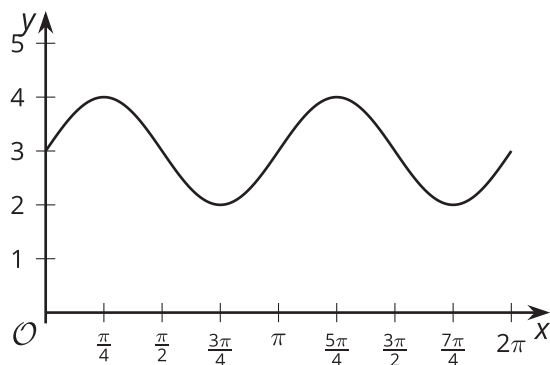
- A. $y = \frac{3}{2}\cos\left(2\pi x - \frac{\pi}{2}\right)$
- B. $y = -\frac{3}{2}\sin(2\pi x)$
- C. $y = \frac{3}{2}\cos(2\pi x)$
- D. $y = \frac{3}{2}\cos\left(2\pi x + \frac{\pi}{2}\right)$
- E. $y = \frac{3}{2}\sin(2\pi x + \pi)$
2. Here is the graph of a trigonometric function.

Which equation has this graph?



- A. $y = \cos(x) + 1$
- B. $y = \frac{1}{2}\cos(x) + 1$
- C. $y = \frac{1}{2}\cos(\pi \cdot x) + 1$
- D. $y = \frac{1}{2}\cos(2\pi \cdot x) + 1$

3. Here is the graph of a trigonometric function.



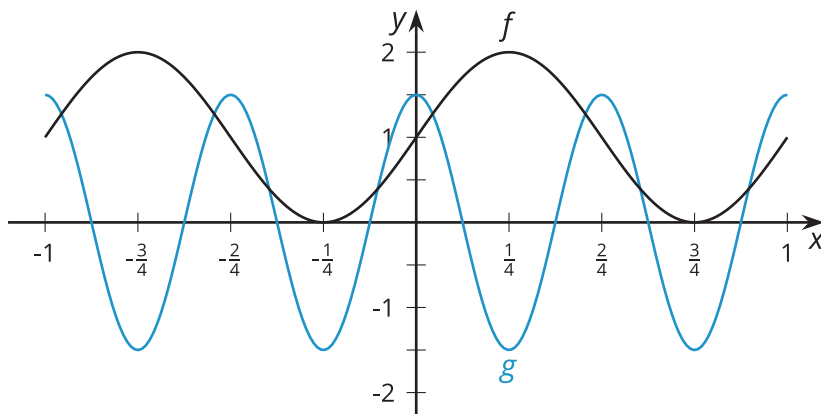
a. Find a trigonometric function f that has this graph. Explain your reasoning.

b. The graph is translated right by $\frac{\pi}{2}$ so it has a minimum value at $x = 0$, then stretched horizontally so its period is 3 times greater than the period of f . Find a trigonometric function g that has this new graph. Explain your reasoning.

4. The function f is given by $f(x) = 4 + 2 \sin(\pi x)$. The graph of g is the graph of f translated left by $\frac{\pi}{2}$ and translated vertically by -1 . Which expression defines g ?

- A. $5 + 2 \sin\left(\pi x + \frac{\pi}{2}\right)$
- B. $3 + 2 \sin\left(\pi x + \frac{\pi}{2}\right)$
- C. $3 + 2 \sin\left(\pi\left(x - \frac{\pi}{2}\right)\right)$
- D. $3 + 2 \sin\left(\pi\left(x + \frac{\pi}{2}\right)\right)$

5. Here are graphs of trigonometric functions f and g . What transformations can be applied to the graph of f to get the graph of g ? Make sure to list them in the order they are applied.



6. The table shows the vertical position of a point at the tip of a windmill blade after the blade has rotated through different angles. The point starts at the location furthest to the right.

a. How long is the windmill blade?
Explain how you know.

b. What is the height of the windmill?
Explain how you know.

rotation angle of windmill	vertical position of P in feet
$\frac{\pi}{6}$	11.25
$\frac{\pi}{3}$	$10 + \frac{2.5\sqrt{3}}{2}$
$\frac{\pi}{2}$	12.5
π	10
$\frac{3\pi}{2}$	7.5

(From Unit 6, Lesson 13.)

7. The function f is given by $f(\theta) = 6 + 5 \cos\left(\theta + \frac{\pi}{2}\right)$. Which of the following are true of f ? Select **all** that apply.

- A. The amplitude of f is 6.
- B. The function f takes its maximum value when $x = 0$.
- C. The midline of f is 6.
- D. The graph of f is the same as the graph of $g(\theta) = 6 + 5 \cos(\theta)$ translated to the right by $\frac{\pi}{2}$.
- E. The graph of f is the same as the graph of $g(\theta) = 6 + 5 \cos(\theta)$ translated to the left by $\frac{\pi}{2}$.

(From Unit 6, Lesson 14.)