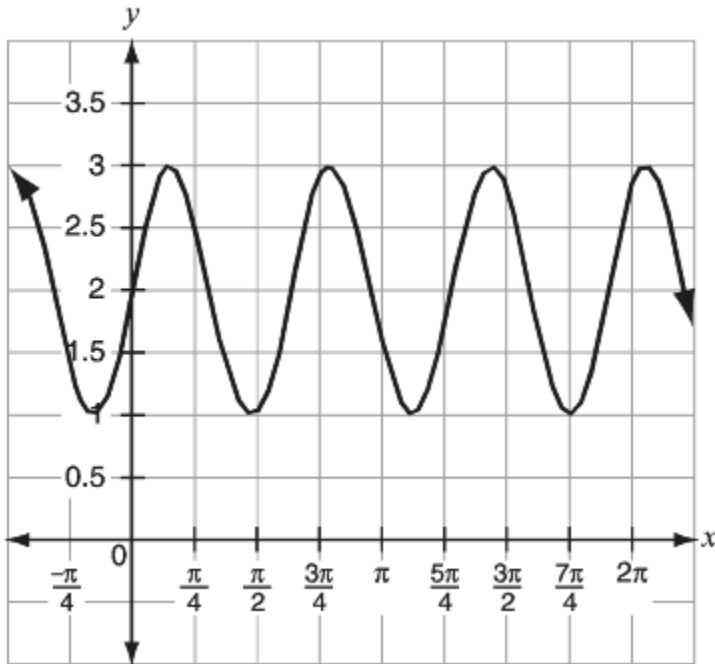


Directions: Answer the following question(s).

1 This graph shows a periodic function.



Which description of the graph is correct?

- | | |
|---|---|
| <p>A. amplitude = 1, midline at $y = 2$</p> <p>B. amplitude = 2, midline at $y = 1$</p> | <p>C. amplitude = 2, midline at $y = 2$</p> <p>D. amplitude = 3, midline at $y = 2$</p> |
|---|---|

2 Consider the following information about a trigonometric function f below.

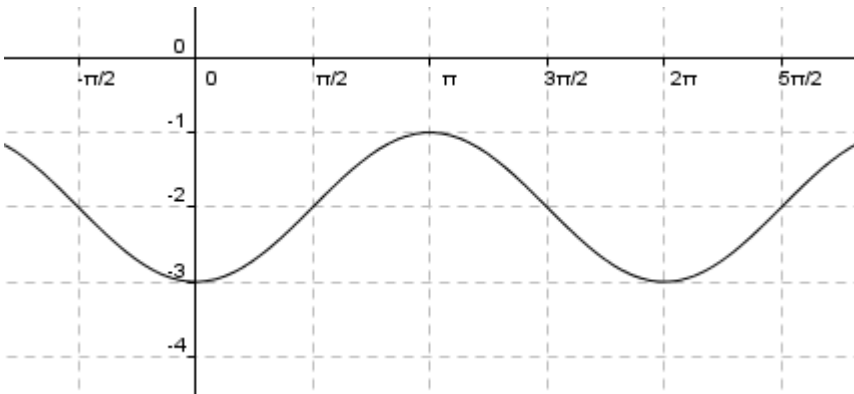
The amplitude $A = 2$, period $P = \frac{2\pi}{3}$, the phase shift is $\frac{\pi}{3}$ units to the right, and the vertical shift is 2 units down.

What is the equation for f in terms of θ ?

- | | |
|---|---|
| <p>A. $f(\theta) = 2\sin(3\theta - \frac{\pi}{2}) - 2$</p> <p>B. $f(\theta) = 4\sin(3\theta - \frac{\pi}{3}) - 2$</p> | <p>C. $f(\theta) = 2\sin(3\theta + \pi) - 2$</p> <p>D. $f(\theta) = 2\sin(3\theta - \pi) - 2$</p> |
|---|---|

Directions: Answer the following question(s).

3 What is the amplitude of this function?



- A. -2
B. 1

- C. 2
D. 2π

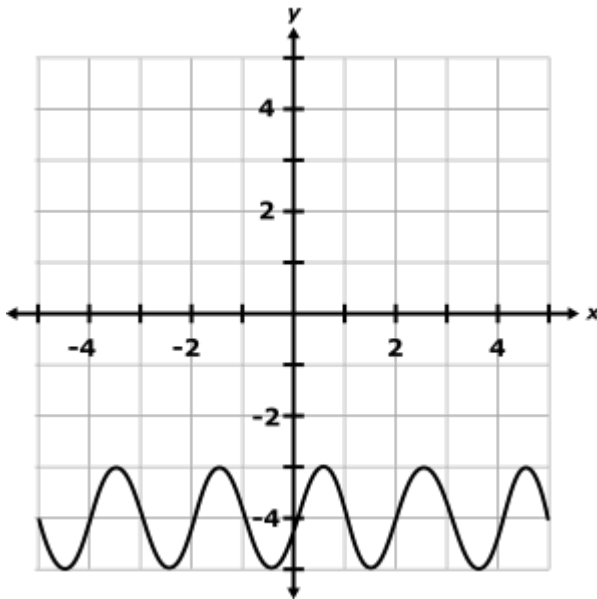
Directions: Answer the following question(s).

- 4 A student studying radio signals decided to focus in on a certain radio station to determine the graph of the radio signals used. The student determined that the radio station uses the following function for its radio signals.

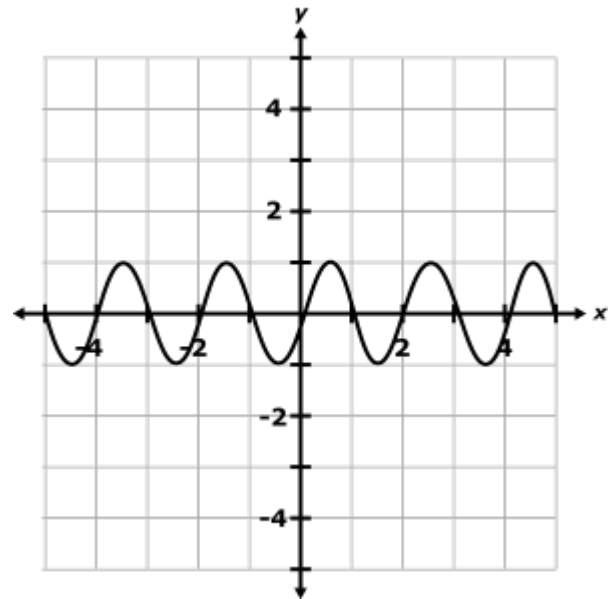
$$f(x) = 4\sin(\pi x)$$

Which of the following options correctly graphs the function of the radio station's radio signal?

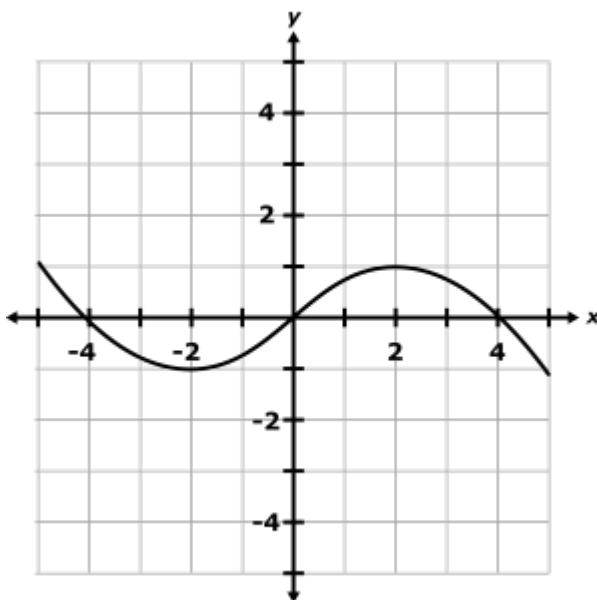
A.



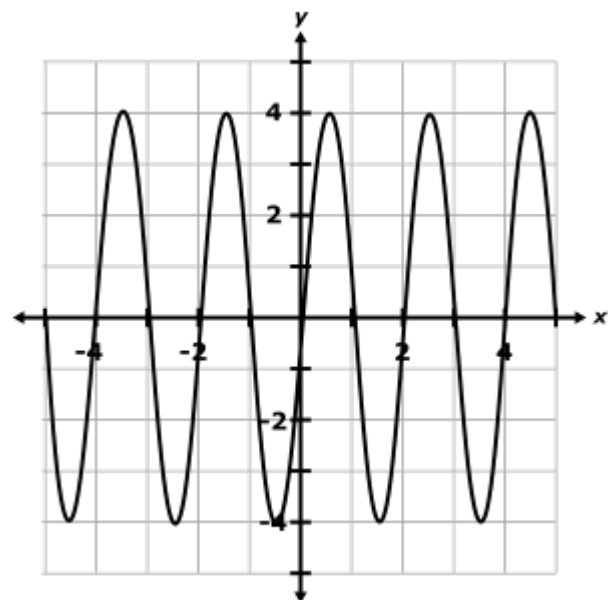
C.



B.



D.



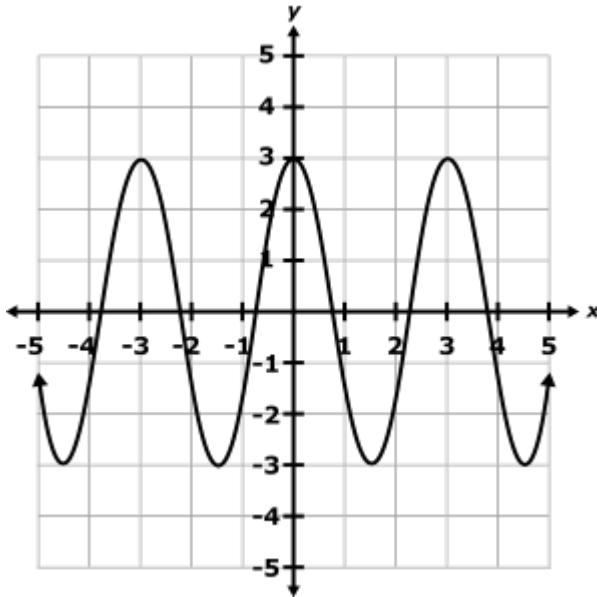
Directions: Answer the following question(s).

- 5 Kyle is working in the lab using sound waves and finding the models to describe the sound waves. He neglected to find the model of the sound wave shown below.

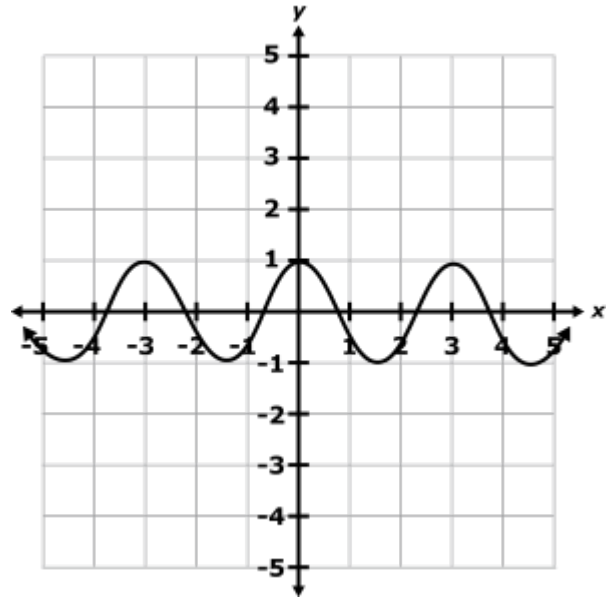
$$f(x) = 3\cos\left(\frac{2\pi}{3}x\right)$$

Which graph of the sound wave correctly matches the equation above?

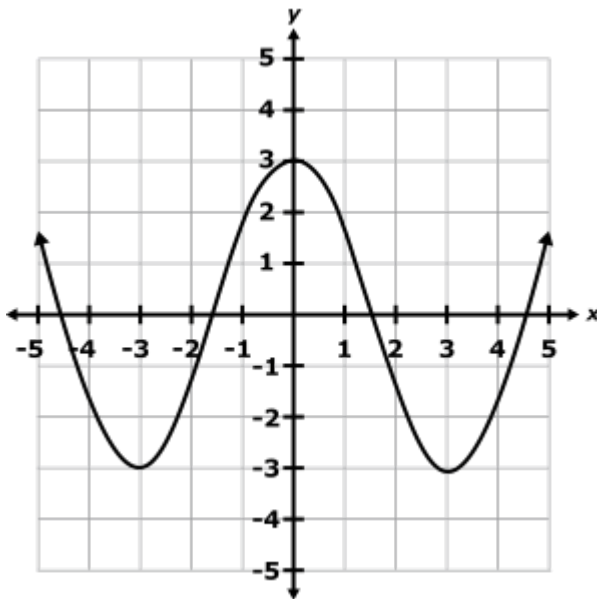
A.



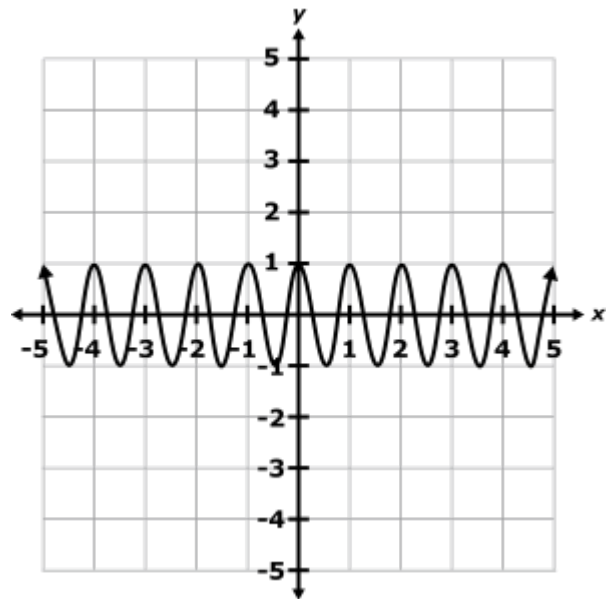
C.



B.

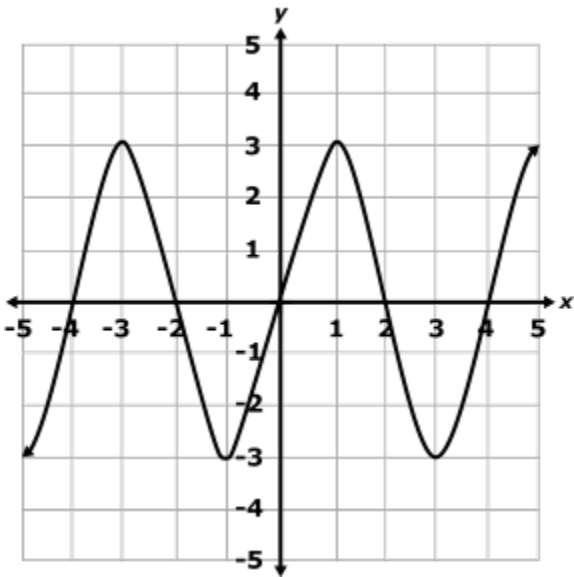


D.



Directions: Answer the following question(s).

6



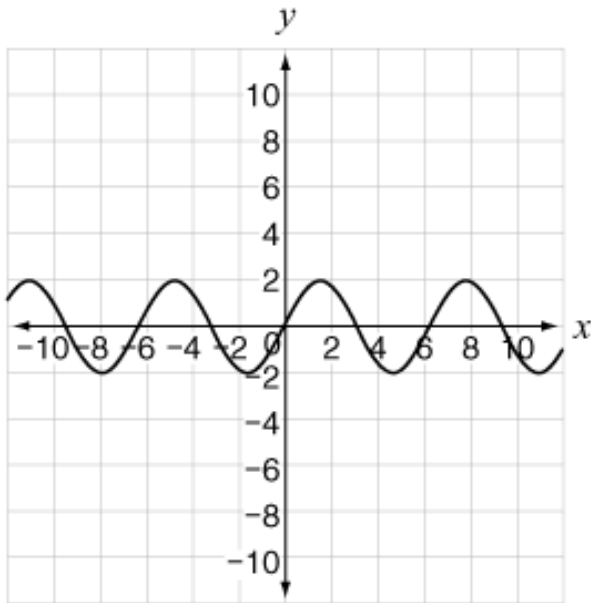
Mark is listening to his radio and tunes it to the frequency represented above. Which equation can Mark use to describe the graph for the frequency of the radio?

- A. $3\cos\left(\frac{\pi}{2}x\right)$
- B. $3\sin(\pi x)$
- C. $3\sin\left(\frac{\pi}{2}x\right)$
- D. $6\sin\left(\frac{\pi}{2}x\right)$

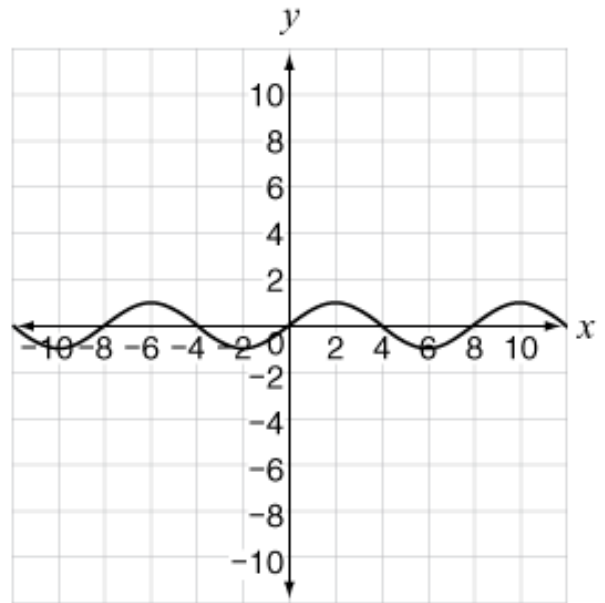
Directions: Answer the following question(s).

7 Which function has an amplitude of 4 units?

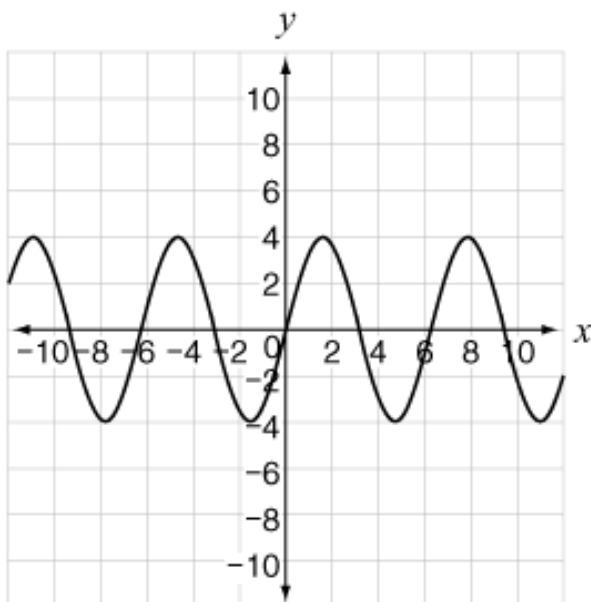
A.



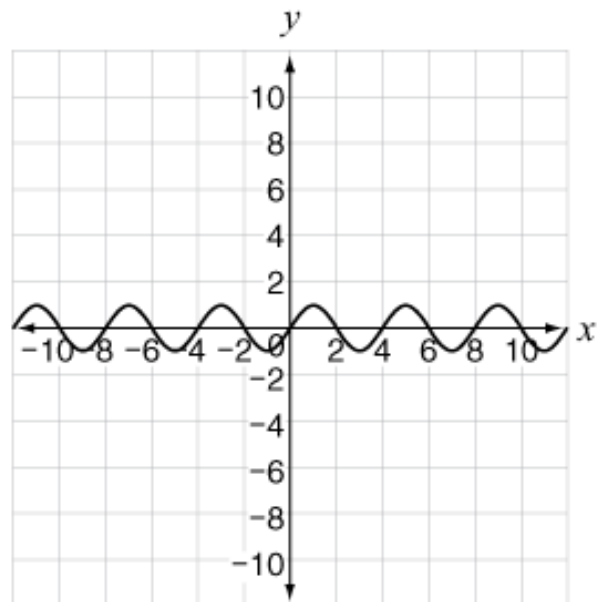
C.



B.



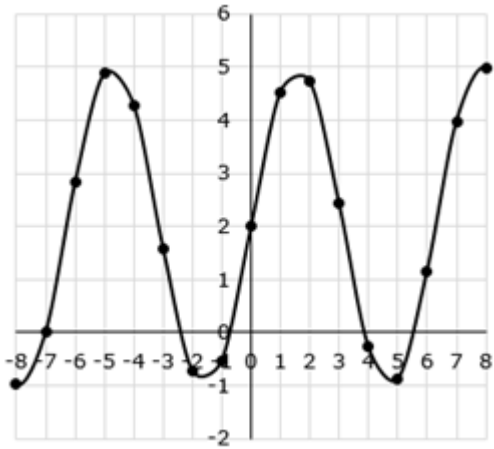
D.



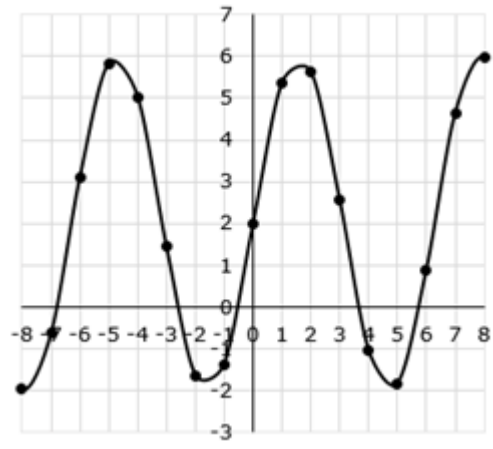
Directions: Answer the following question(s).

8 Which graph below has a midline about 2, an amplitude of about 4, and a period of about 7?

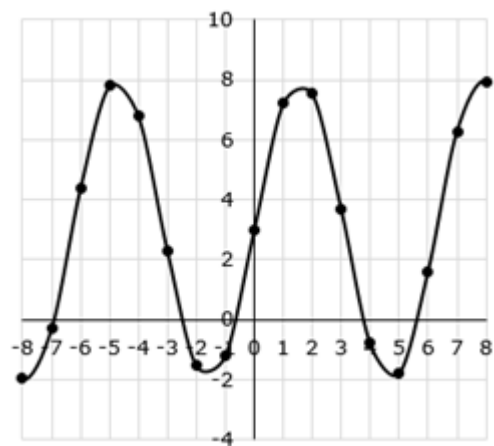
A.



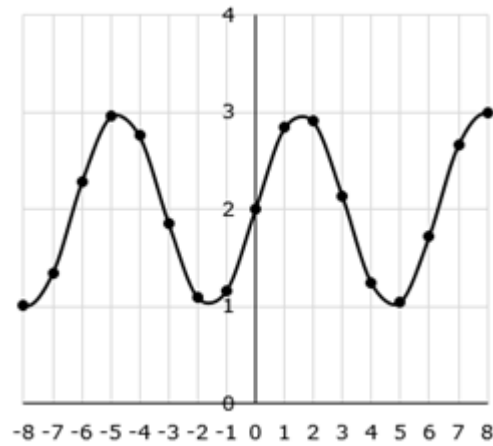
C.



B.



D.



9 A reflector is attached to the wheel of a mountain bike. The height, h , in inches, of this reflector with respect to the ground can be modeled by the function below, where t is the time, in seconds.

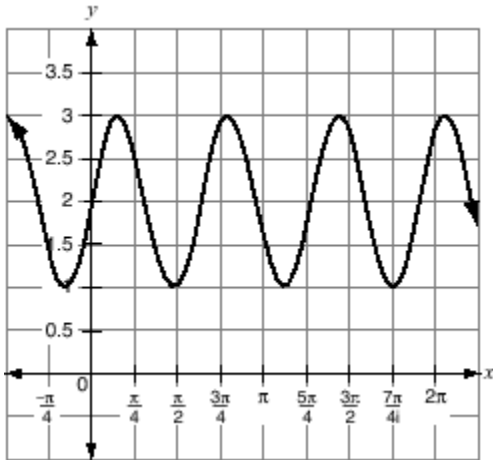
$$h(t) = 13 + 9.5\cos\left(\frac{40\pi}{3}t\right)$$

When the function is graphed on a coordinate plane, which of the following interpretations are correct? Select the *three* correct interpretations.

- A. The midline of the height of the reflector is 9.5 inches.
- B. The midline of the height of the reflector is 13.0 inches.
- C. The maximum height reached by the reflector is 22.5 inches.
- D. The period indicates that the reflector makes 0.15 of a complete turn per second.
- E. The period indicates that the reflector makes a complete turn every 0.15 seconds.

Directions: Answer the following question(s).

10 This graph shows a periodic function.

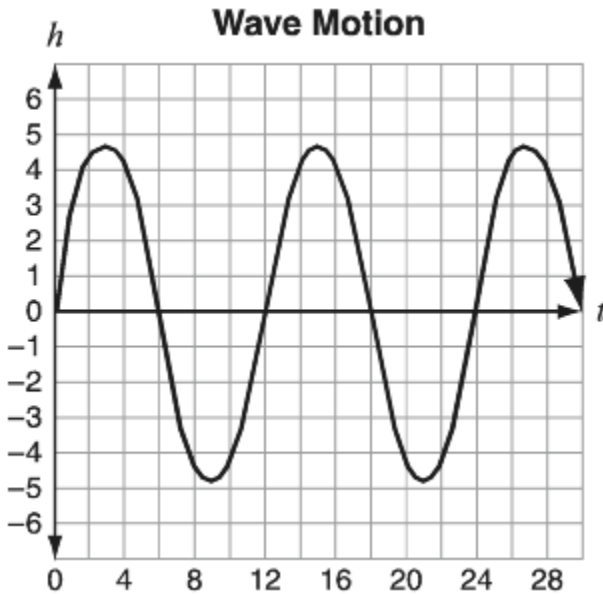


Which description of the graph is correct?

- A. amplitude = 1, midline at $y = 2$
- B. amplitude = 2, midline at $y = 1$
- C. amplitude = 2, midline at $y = 2$
- D. amplitude = 3, midline at $y = 2$

Directions: Answer the following question(s).

- 11 An ocean buoy is used to measure the motion of waves. This graph represents a model of wave motion, where the height, h , is measured in feet and the time, t , is measured in seconds.



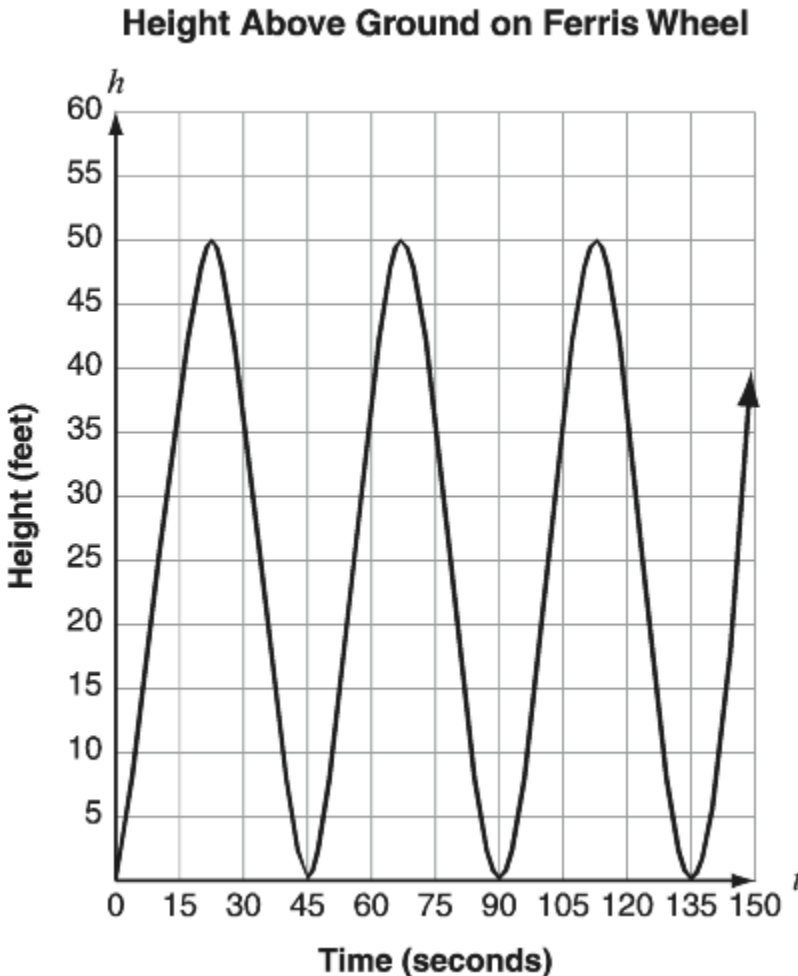
The difference between the crest (highest point) and trough (lowest point) of the wave is measured at 9.8 feet.

Which equation can be used to model the wave motion?

- A. $h = 4.9\sin\left(\frac{\pi t}{6}\right)$
- B. $h = 4.9\sin\left(\frac{\pi t}{12}\right)$
- C. $h = 9.8\sin\left(\frac{\pi t}{6}\right)$
- D. $h = 9.8\sin\left(\frac{\pi t}{12}\right)$

Directions: Answer the following question(s).

- 12 On a certain Ferris wheel, passengers are loaded at the ground level and rise to a maximum height of 50 feet. This graph represents the height, h , from the ground of a person on the Ferris wheel after t seconds.



Which function can be used to find the height of the person after any number of seconds?

- A. $h(t) = 25\cos(0.14t + \pi)$ C. $h(t) = 25\cos(0.14t + \pi) + 25$
 B. $h(t) = 25\sin(0.14t + \pi)$ D. $h(t) = 25\sin(0.14t + \pi) + 25$