

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Write the function in the form $y = a \sin b(x - c)$ or $y = a \cos b(x - c)$. Find the period and phase shift.

1) $1 \cos\left(3x + \frac{\pi}{2}\right)$ 1) _____

2) $-2 \cos\left(5x - \frac{\pi}{6}\right)$ 2) _____

3) $\frac{5}{2} \cos\left(\frac{\pi x}{4} + \frac{\pi}{4}\right)$ 3) _____

Sketch at least one period of the graph of the given equation.

4) $y = 2 \sin x$ 4) _____

5) $y = -2 \cos x$ 5) _____

6) $y = \cos x - 1$ 6) _____

7) $y = \frac{3}{2} \cos \frac{1}{3}x$ 7) _____

8) $y = 4 \sin\left(x - \frac{\pi}{3}\right)$ 8) _____

Graph the function over a one-period interval.

9) $y = \frac{3}{2} \sin\left[2\left(x - \frac{\pi}{3}\right)\right]$ 9) _____

Solve the problem.

10) A weight attached to a spring is pulled down 9 inches below the equilibrium position. Assuming that the period of the system is $\frac{1}{8}$ second, determine a trigonometric model that gives the position of the weight at time t seconds. 10) _____

11) The elk population in a certain region is given by the function $E(t) = 900 + 150\sin\left(\frac{4t}{5}\right)$, where the time t is measured in years. What is the largest number of elk present in the region at any time? 11) _____

12) The elk population in a certain region is given by the function $E(t) = 480 + 90\sin\left(\frac{4t}{5}\right)$, where the time t is measured in years. How much time elapses between occurrences of the largest and smallest elk population? 12) _____