

1. Find the coordinate increments from A to B.

A(0,10), B(0,1)

$\Delta x =$

(Simplify your answer.)

$\Delta y =$

(Simplify your answer.)

2. Let L be the line determined by the points A and B. Plot A and B, draw the graph of L, and find the slope of L.

A(-3,9), B(7,-3)

Use the graphing tool on the right to plot A and B and graph the line L.

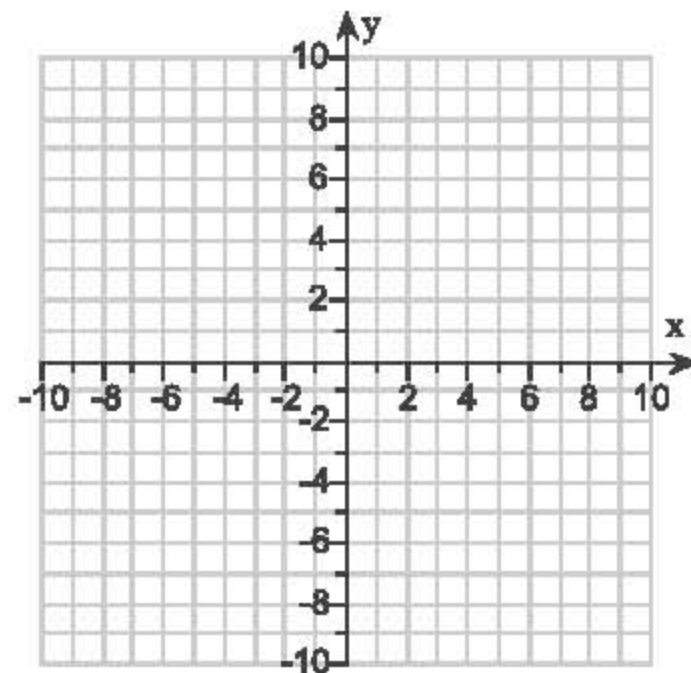


What is the slope of L? Select the correct choice below and fill in any answer boxes within your choice.

A. $m =$

(Simplify your answer.)

B. The slope is undefined.



3. Write a formula for the function and use the formula to find the indicated value of the function.

the height h of an equilateral triangle as a function of its side length s ; the height of an equilateral triangle of side length 10 m.

Write a formula for the function.

$h(s) =$

(Simplify your answer. Type an exact answer, using radicals as needed.)

What is the height of an equilateral triangle of side length 10 m?

m

(Simplify your answer. Type an exact answer, using radicals as needed.)

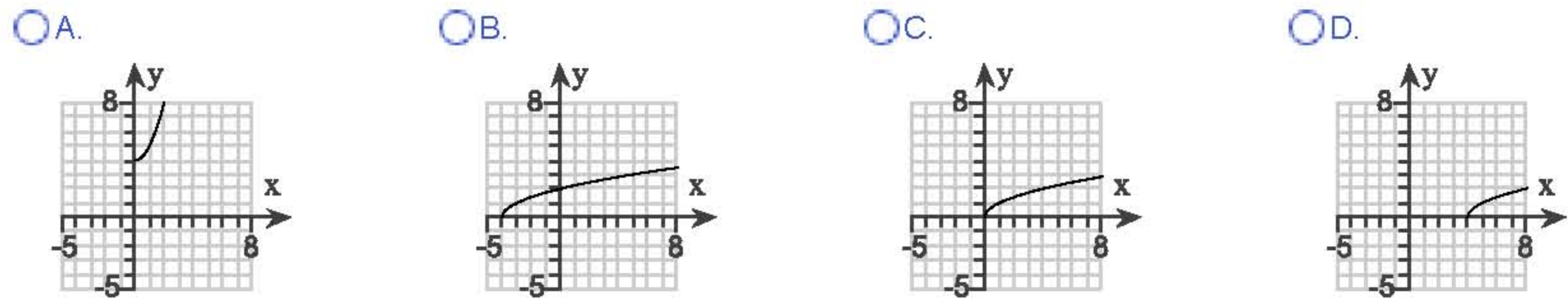
4. Find the domain and graph the function.

$$f(x) = \sqrt{x - 4}$$

Choose the domain of the function.

- A. $[4, \infty)$
 B. $(4, \infty)$
 C. $[-4, \infty)$
 D. $(0, \infty)$

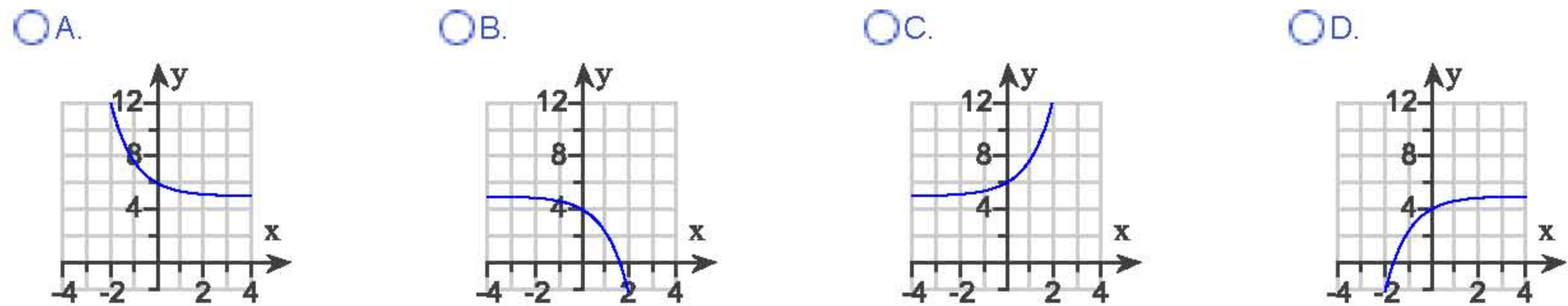
Choose the correct graph of the function.



5. Graph the given function and state its domain and range.

$$y = e^x + 5$$

Choose the correct graph below.



The domain of the function is .
 (Type your answer in interval notation.)

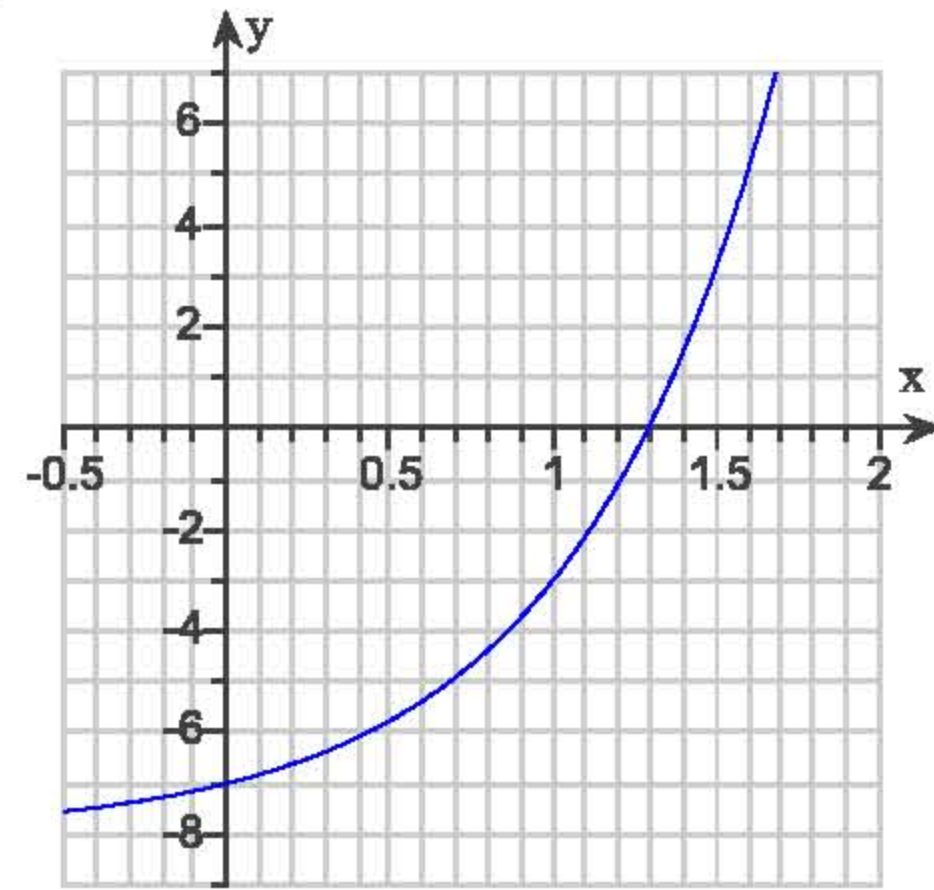
The range of the function is .
 (Type your answer in interval notation.)

6. Use the graph to find the zeros of the given function.

$$f(x) = 5^x - 8$$

$f(x)$ has a zero at approximately .

(Round to the nearest tenth.)



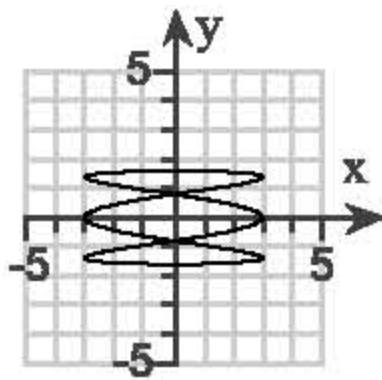
7. Graph.

$$x = 3 \sin(3t)$$

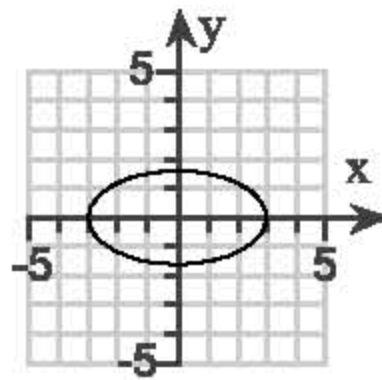
$$y = 1.6 \cos(t)$$

Choose the correct answer below.

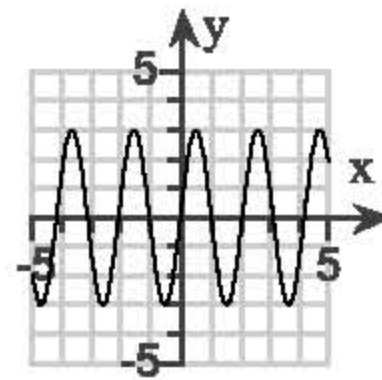
A.



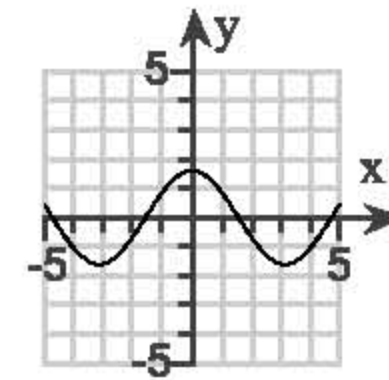
B.



C.



D.

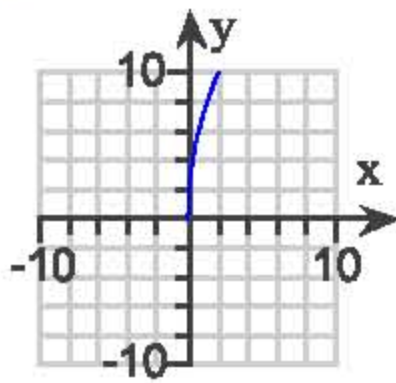


8. Graph the curve defined by the given parametrization and identify its initial and terminal points, if any. Indicate the direction in which the curve is traced. Then find a Cartesian equation for the curve.

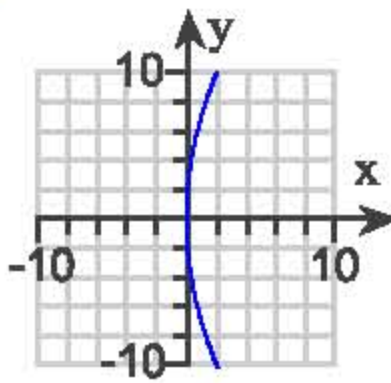
$$x = \frac{t}{49}, \quad y = \sqrt{t}, \quad t \geq 0$$

Choose the correct graph below.

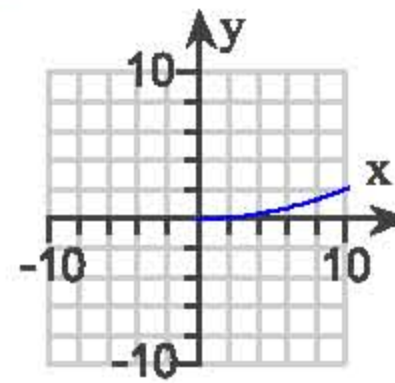
A.



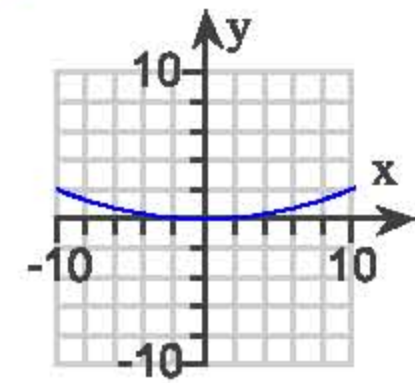
B.



C.



D.



What is the initial point of this curve? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. (Simplify your answer. Type an ordered pair.)

B. There is no solution.

What is the terminal point of this curve? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. (Simplify your answer. Type an ordered pair.)

B. There is no solution.

In what direction is the curve traced?

Left to right

Right to left

Write a Cartesian equation for this curve.

$y =$

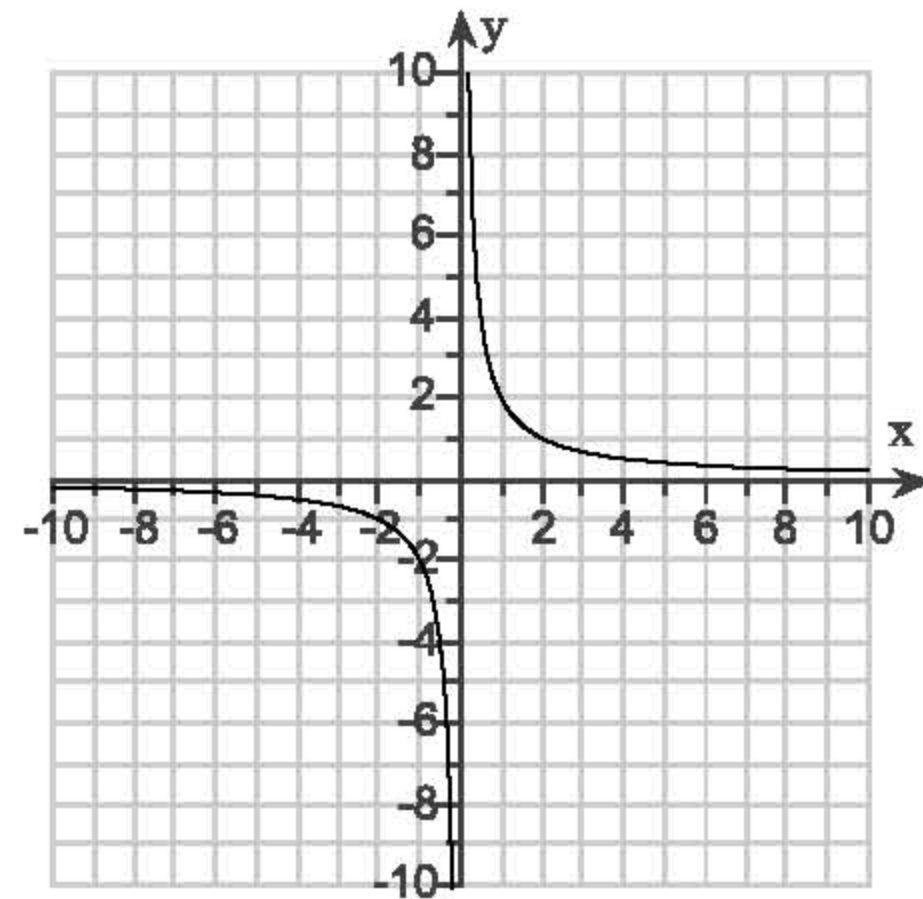
(Simplify your answer. Use integers or fractions for any numbers in the expression.)

9. Determine whether the function is one-to-one.

$$y = \frac{2}{x}$$

Is the function one-to-one?

- Yes
 No



10. Find the inverse.

$$g(x) = 8x + 1$$

$$g^{-1}(x) = \square$$

11. Find the arc length subtended on a circle of radius 11 by a central angle of measure $\frac{\pi}{4}$.

The arc length is \square .

(Simplify your answer. Type an exact answer, using π as needed.)

12. Determine if the function is even or odd.

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Is the function even or odd?

- Odd
 Even

13. Either $\sin x$, $\cos x$, or $\tan x$ is given. Find the other two if x lies in the specified interval.

$$\sin x = -\frac{5}{13}, \quad x \in \left[\frac{3\pi}{2}, 2\pi \right]$$

$$\tan x = \square$$

(Type a simplified fraction.)

$$\cos x = \square$$

(Type a simplified fraction.)

14. Determine the amplitude, period, and phase shift of $y = 4 \cos\left(\frac{\pi}{2}x + \pi\right)$.

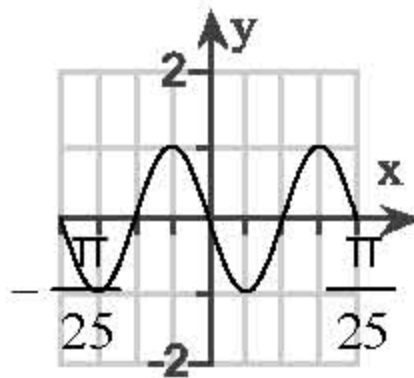
The amplitude is . The period is . The phase shift is .

15. Determine an appropriate viewing window for the given function, and use it to display its graph.

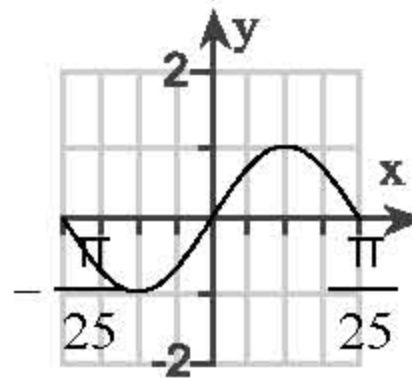
$y = \sin(50x)$

Choose the correct graph of the function.

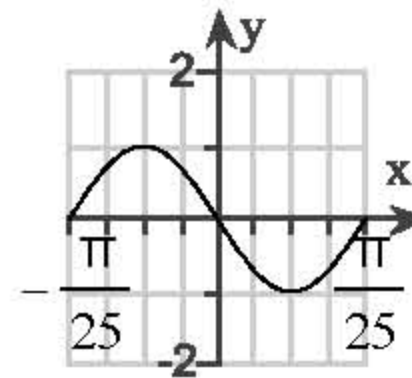
A.



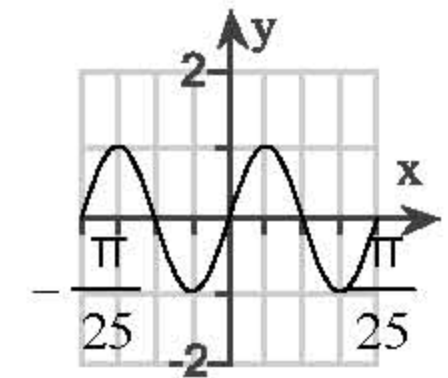
B.



C.

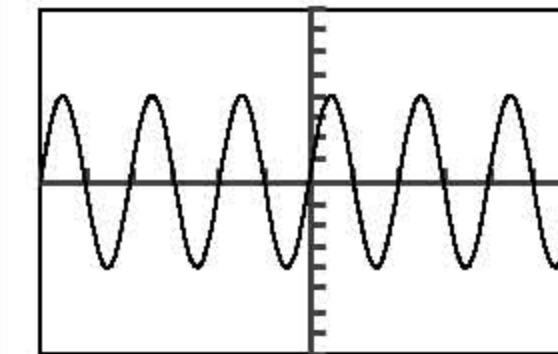


D.



16. Specify the period and the amplitude of the given function and identify the viewing window of its graph.

$y = 2.0 \sin 3x$



The period is .

The amplitude is .

A graph of the given function is shown above. What is the viewing window of this graph?

A. $\left[-\frac{2\pi}{3}, \frac{2\pi}{3}\right]$ by $[-4, 4]$

B. $\left[-\frac{2\pi}{3}, \frac{2\pi}{3}\right]$ by $[-2, 2]$

C. $[-2\pi, 2\pi]$ by $[-2, 2]$

D. $[-2\pi, 2\pi]$ by $[-4, 4]$

17. An object dropped from rest from the top of a tall building on Planet X falls a distance $y = 5t^2$ feet in the first t seconds. Find the average speed of the object during the first 6 seconds of fall.

The average speed of the object during the first 6 seconds of the fall is $\frac{\text{feet}}{\text{sec}}$.

(Simplify your answer.)

18. Use $\lim_{x \rightarrow c} k = k$, $\lim_{x \rightarrow c} x = c$, and the properties of limits to find the following limit.

$$\lim_{x \rightarrow c} (2x^5 - 8x^3 + 3x - 2)$$

$$\lim_{x \rightarrow c} (2x^5 - 8x^3 + 3x - 2) = \square$$

(Simplify your answer.)

19. Use the limit rules to determine the following limit.

$$\lim_{x \rightarrow 3} (3x^3 - 8x^2 + 6)$$

$$\lim_{x \rightarrow 3} (3x^3 - 8x^2 + 6) = \square$$

(Simplify your answer.)

20. Use the limit rules to determine the following limit.

$$\lim_{x \rightarrow 8} \frac{x^2 - 4x - 32}{x - 8}$$

$$\lim_{x \rightarrow 8} \frac{x^2 - 4x - 32}{x - 8} = \square$$

(Simplify your answer.)

21. Find $\lim_{y \rightarrow -1} (7 - y)^{4/3}$.

$$\lim_{y \rightarrow -1} (7 - y)^{4/3} = \square$$

(Simplify your answer.)

22. Use the definition shown below to find the derivative of the function $f(x) = \frac{9}{x}$ at the point $a = 2$.

$$f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

$$f'(2) = \square$$

(Type an integer or a simplified fraction.)

23. Using the definition, calculate the derivative of the function. Then find the values of the derivative as specified.

$$f(x) = 2 - x^2; f'(-5), f'(0), f'(6)$$

$$f'(x) = \square$$

(Simplify your answer.)

$$f'(-5) = \square$$

(Simplify your answer.)

$$f'(0) = \square$$

(Simplify your answer.)

$$f'(6) = \square$$

(Simplify your answer.)

24. Use the definition shown below to find the derivative of the function $f(x) = \frac{8}{x}$ at the point $a = 7$.

$$f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

$$f'(7) = \square$$

(Type an integer or a simplified fraction.)

25. Using the definition, calculate the derivative of the function. Then find the values of the derivative as specified.

$$f(x) = 7 - x^2; f'(-6), f'(0), f'(9)$$

$$f'(x) = \square$$

(Simplify your answer.)

$$f'(-6) = \square$$

(Simplify your answer.)

$$f'(0) = \square$$

(Simplify your answer.)

$$f'(9) = \square$$

(Simplify your answer.)

26. Use the alternative formula for the derivative to find the derivative of $f(x) = \frac{3}{x}$ at $a = 7$.

$$f'(7) = \square$$

(Simplify your answer.)

27. Find the indicated derivative.

$$\frac{dy}{dx} \text{ if } y = -4x^3$$

$$\frac{dy}{dx} = \square$$

(Simplify your answer.)

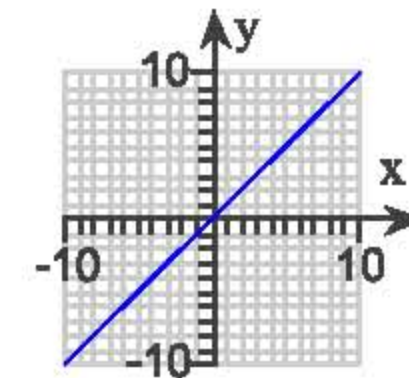
28. Find the indicated derivative.

$$\frac{dy}{dx} \text{ if } y = -5x^3$$

$$\frac{dy}{dx} = \square$$

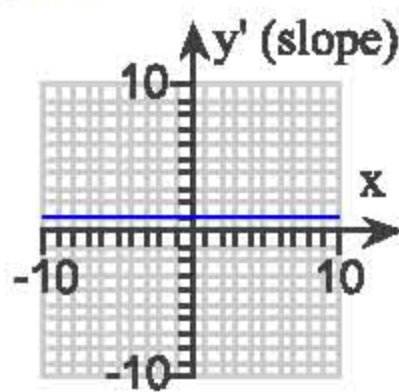
(Simplify your answer.)

29. Match the graph of the function on the right with the graph of its derivative.

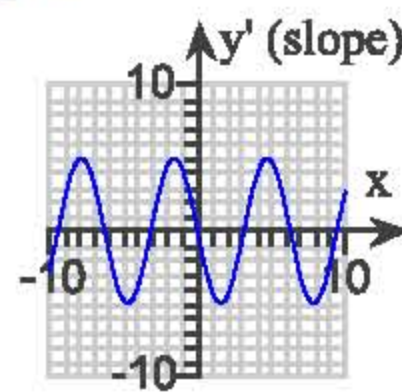


Choose the graph that is the derivative of the given function.

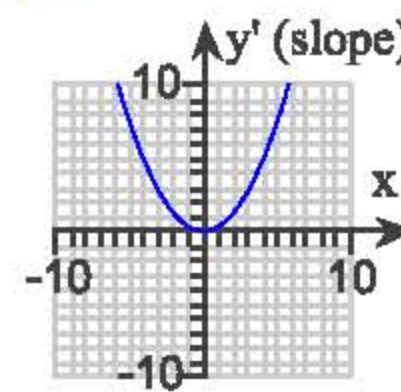
A.



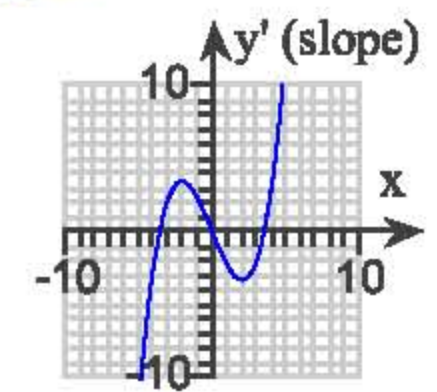
B.



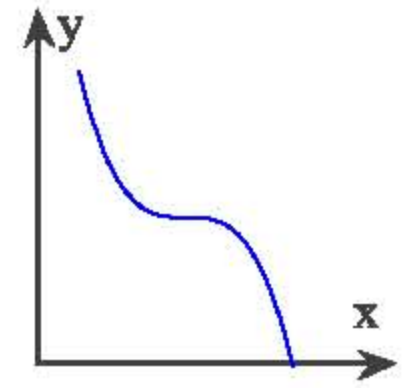
C.



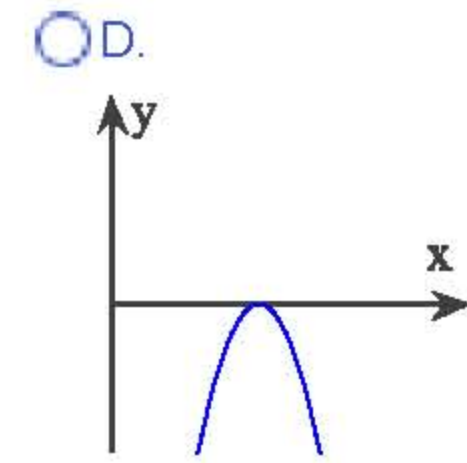
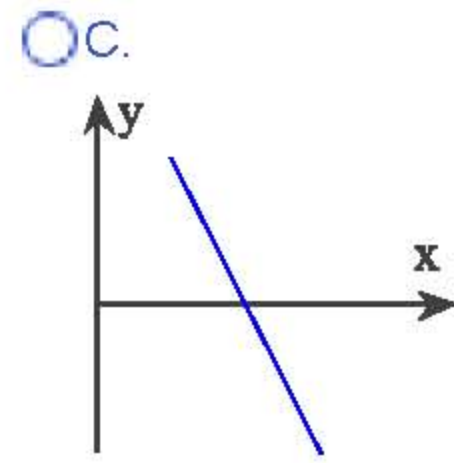
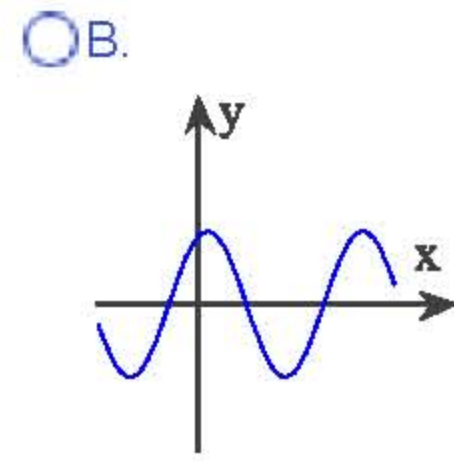
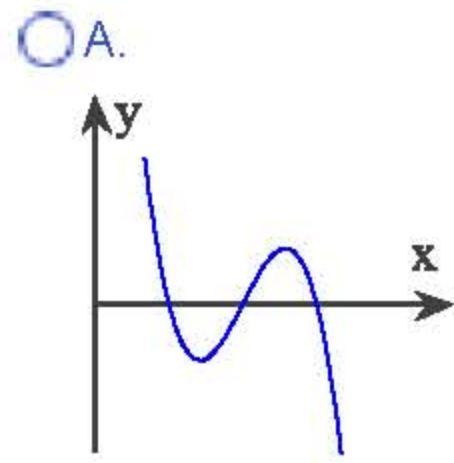
D.



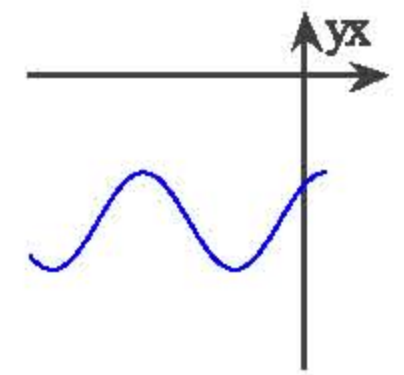
30. Graph the derivative of the function graphed on the right.



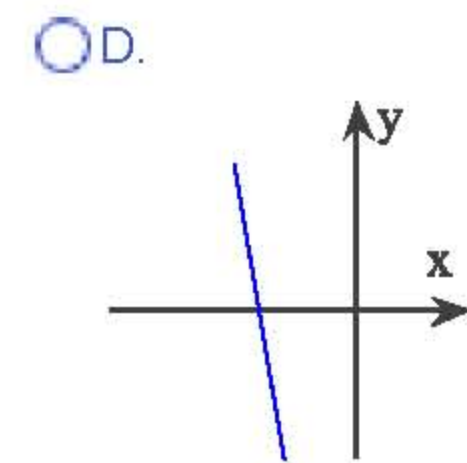
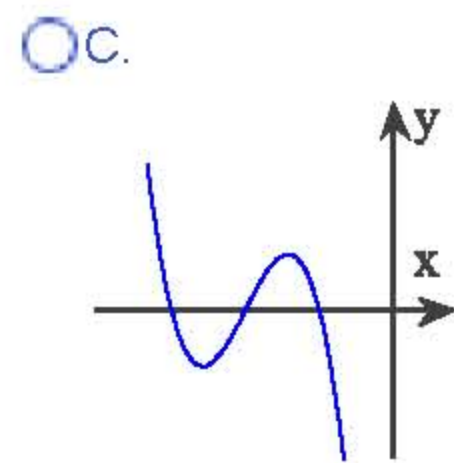
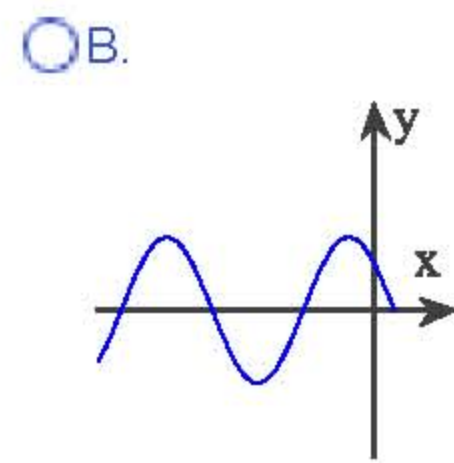
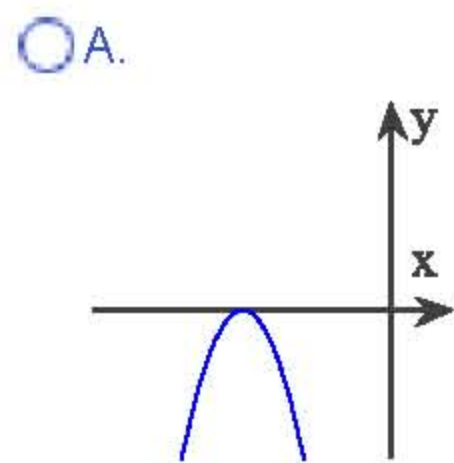
Choose the correct graph below.



31. Graph the derivative of the function graphed on the right.



Choose the correct graph below.



32. Find the lines that are (a) tangent and (b) normal to the curve $y = x^3$ at the point $(1,1)$.

(a) Find an equation for the tangent line to the curve $y = x^3$ at $(1,1)$.

$y = \square$ (Simplify your answer.)

(b) Find an equation for the normal line to the curve $y = x^3$ at $(1,1)$.

$y = \square$ (Simplify your answer.)

Book: Finney: Calculus: Graphical,
Numerical, Algebraic, 3e

33. Find the lines that are tangent and normal to the curve $y = 9\sqrt{x}$ at $x = 4$.

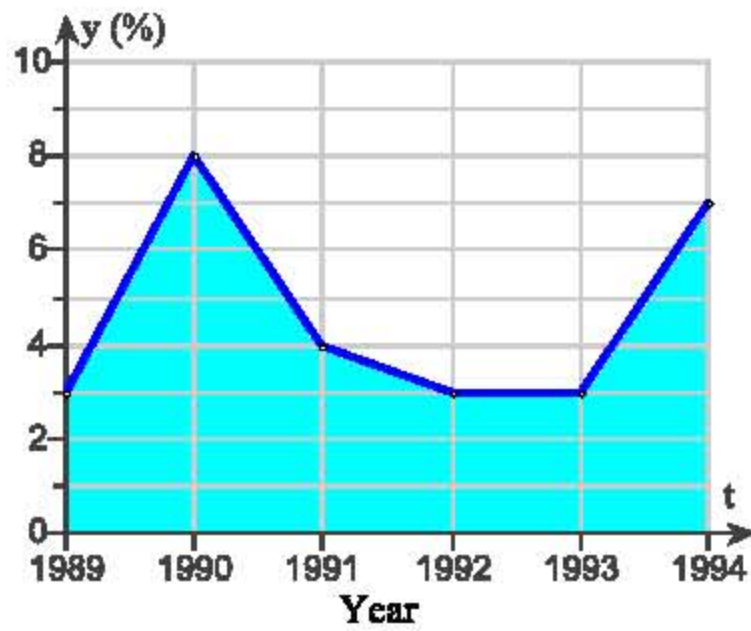
The equation of the tangent line at $x = 4$ is $y = \square$.

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

The equation of the normal line at $x = 4$ is $y = \square$.

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

34. The graph of the accompanying figure shows the average annual percentage change $y = f(t)$ in a particular country's gross national product (GNP) for the years 1989-1994.



Choose the correct graph of $\frac{dy}{dt}$.

