Name_____

Evaluate the function.

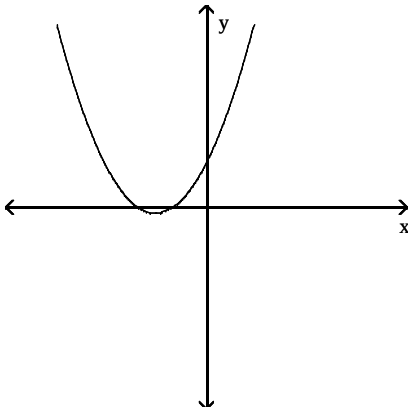
1) For $f(x) = x^2 + 2x - 7$, find f(1). 1) _____

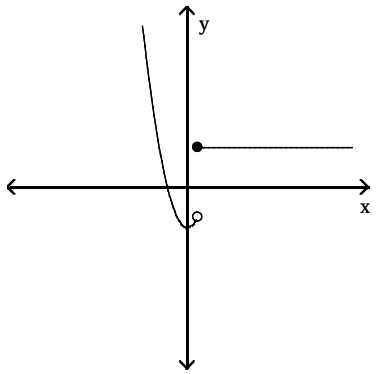
2) For $f(x) = 2x^2 + 2x - 6$, find f(k – 1). 2) _____

3) For $f(x) = \sqrt{3 - x}$, find f(m + 2). 3) _____

Determine whether the graph is the graph of a function.

4) 4) _____



5) 

5) _____

For the given function, find and simplify [f(x + h) – f(x)]/h.

6) f(x) = 7x + 3

6) _____

7) $f(x) = \frac{1}{4x}$

7) _____

8) $f(x) = x^2 + 7x - 6$

8) _____

Find the natural domain of the function.

9) $f(x) = \frac{6}{2x - 4}$

9) _____

10) $f(x) = \frac{x - 8}{\sqrt{x + 8}}$

10) _____

11) $f(x) = \sqrt{9 - x^2}$ 11) _____

Determine if the function is even, odd, or neither.

12) $f(x) = -1$ 12) _____

13) $f(x) = 6x^4 + 2x + 8$ 13) _____

14) $f(x) = -8x^5 + 2x^3$ 14) _____

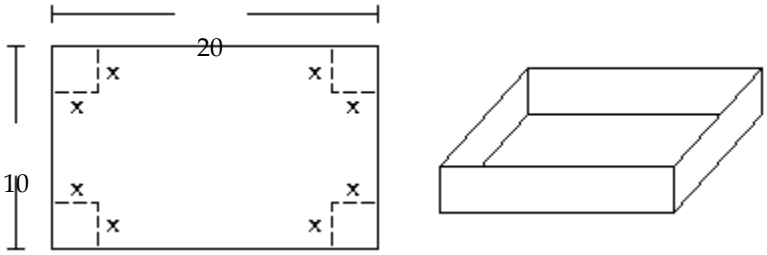
15) $f(x) = \dfrac{-3}{x^2 - 1}$ 15) _____

16) $f(x) = \dfrac{-6}{x - 4}$ 16) _____

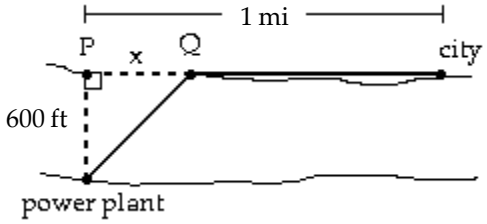
17) $g(x) = \dfrac{-8x}{x^2 + 9}$ 17) _____

Solve the problem.

18) A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 10 inches by 20 inches by cutting out equal squares of side x at each corner and then folding up the sides as in the figure. Express the volume V of the box as a function of x. 18) _____



19) A power plant is located on a river that is 600 feet wide. To lay a new cable from the plant to a location in a city 1 mile downstream on the opposite side costs $175 per foot across the river and $100 per foot along the land. Suppose that the cable goes from the plant to a point Q on the opposite side that is x feet from the point P directly opposite the plant. Write a function C(x) that gives the cost of laying the cable in terms of the distance x. 19) _____



For the given functions f and g, find the requested function or functional value.

20) $f(x) = 7x - 9$, $g(x) = 9x - 4$ 20) _____
Find $f - g$.

21) $g(x) = -2x - 1$; $f(x) = -5x^2 + 3x + 5$ 21) _____
Find $\left(\frac{f}{g}\right)(-3)$.

For the given functions, find the requested function or functional value.

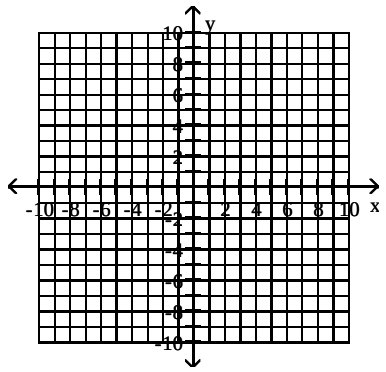
22) For $f(x) = 8x + 6$ and $g(x) = 3x - 1$, find $(f \circ g)(x)$. 22) _____

23) For $f(x) = \frac{6}{x + 8}$ and $g(x) = \frac{5}{7x}$, find $(f \circ g)(x)$. 23) _____

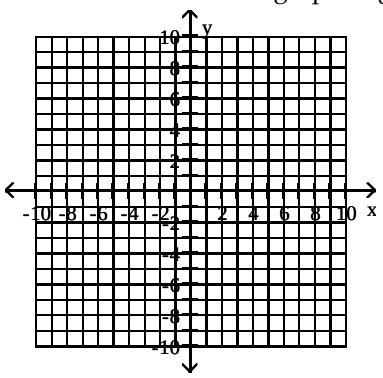
24) For $f(x) = \frac{x - 6}{10}$ and $g(x) = 10x + 6$, find $(g \circ f)(x)$. 24) _____

Sketch the requested graphs.

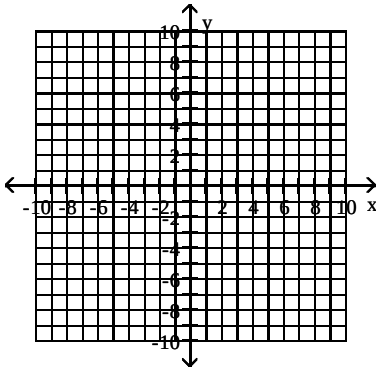
25) Begin by graphing the standard square root function $f(x) = \sqrt{x}$ as a solid curve. Then use transformations of this graph to graph the function $g(x) = \sqrt{x} - 1$ as a dashed curve. 25) _____



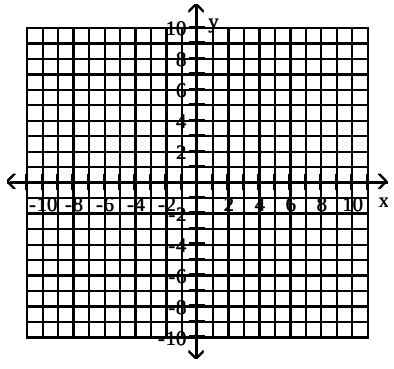
26) Begin by graphing the standard square root function $f(x) = \sqrt{x}$ as a solid curve. Then use transformations of this graph to graph the function $g(x) = \sqrt{x + 2}$ as a dashed curve. 26) _____



27) Begin by graphing the standard absolute value function $f(x) = |x|$ as a solid curve. Then use transformations of this graph to graph the function $g(x) = |x - 6| - 6$ as a dashed curve. 27) _____



28) Begin by graphing the standard quadratic function $f(x) = x^2$ as a solid curve. Then use transformations of this graph to graph the function $h(x) = (x - 2)^2 + 6$ as a dashed curve. 28) _____



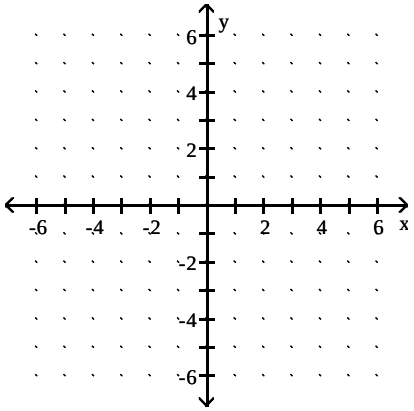
Find the inverse of the function.

29) $f(x) = 2x + 3$ 29) _____

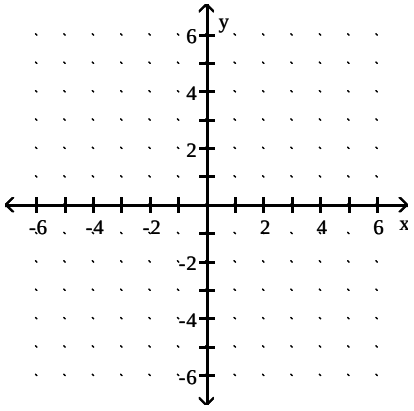
30) $f(x) = x^3 - 5$ 30) _____

Graph the exponential function.

31) $y = 2^x$ 31) _____

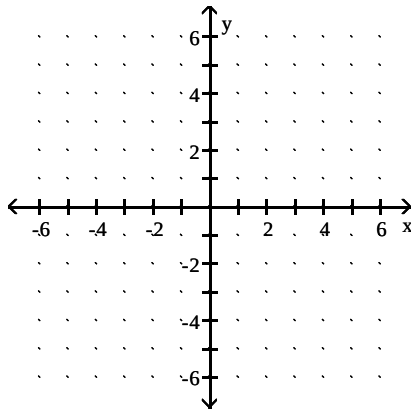


32) $y = \left(\frac{1}{4}\right)^x$ 32) _____

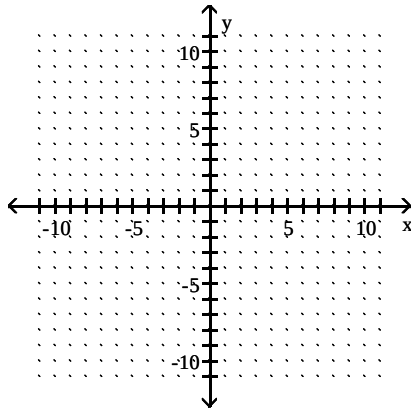


Graph the function.

33) $y = \log_5 x$ 33) _____



34) $f(x) = \log_3 (x + 2)$ 34) _____



Solve for x.

35) $\log_7\left(\frac{1}{x}\right) = 4$ 35) _____

36) $\log_2 5 + \log_2 x = 1$ 36) _____

Solve the problem.

37) Find the hydrogen ion concentration of a solution whose pH is 6.9. Use the formula $pH = -\log [H^+]$. 37) _____

38) If an earthquake measures 5.4 on the Richter scale, what is its intensity, I, in terms of I_0? Use $R = \log_{10}(I/I_0)$. 38) _____

Express the angle in radian measure in terms of π.

39) 330° 39) _____

Convert the radian measure to degrees. Round to the nearest hundredth if necessary.

40) $\frac{11\pi}{10}$ 40) _____

Find the exact value of the trigonometric function. Do not use a calculator or tables.

41) $\sin\left(\frac{4\pi}{3}\right)$ 41) _____

42) $\cos\left(\frac{11\pi}{6}\right)$ 42) _____

Which answer choice is equivalent to the given expression?

43) $\frac{1 + \sin x}{\cos x}$ 43) _____

A) $\frac{\cos x}{1 + \sin x}$ B) $\frac{\cos x}{1 - \sin x}$ C) $\frac{\sin x}{1 - \cos x}$

Find the period, amplitude, or shift.

44) Find the period of $y = -5\cos\left(5x + \frac{\pi}{2}\right)$. 44) _____

45) Find the shift for $y = -4 + 2\sin\left(6x + \frac{\pi}{3}\right)$. 45) _____

Determine if the function is even, odd, or neither.

46) $f(t) = t \cos t$ 46) _____

Find the exact value of the real number y.

47) $y = \arcsin\left(\frac{\sqrt{3}}{2}\right)$ 47) _____

48) $y = \arccos\left(\frac{\sqrt{3}}{2}\right)$ 48) _____

Find the formula for $f^{-1}(x)$ for the function f. First indicate how the domain should be restricted so f has an inverse.

49) $f(x) = 6\cos 5x$ 49) _____

50) $f(x) = 9\tan 4x$ 50) _____

1) –4

2) $f(k - 1) = 2k^2 - 2k - 6$

3) $\sqrt{1 - m}$

4) Function

5) Function

6) 7

7) $\frac{-1}{4x(x + h)}$

8) $2x + h + 7$

9) $\{x: x \neq 2\}$

10) $\{x: x > -8\}$

11) $\{x: |x| \leq 3\}$

12) Even

13) Neither

14) Odd

15) Even

16) Neither

17) Odd

18) $V(x) = x(10 - 2x)(20 - 2x)$

19) $C(x) = 175\sqrt{x^2 + 600^2} + 100(5280 - x)$

20) $-2x - 5$

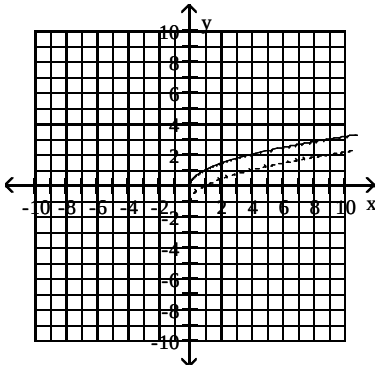
21) $-\frac{49}{5}$

22) $24x - 2$

23) $\frac{42x}{5 + 56x}$

24) x

25)



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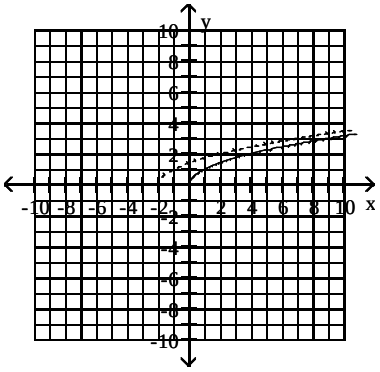

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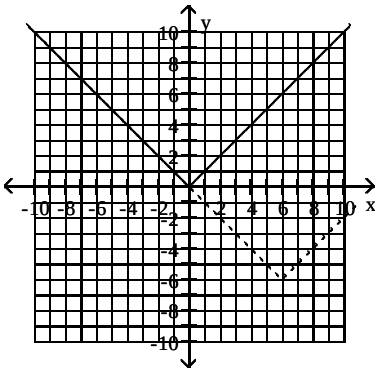

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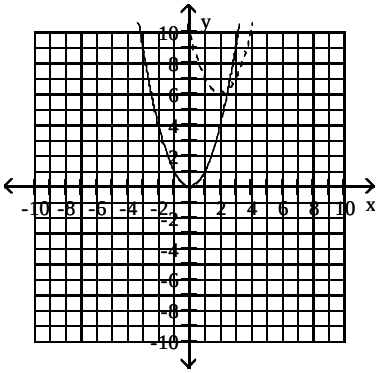
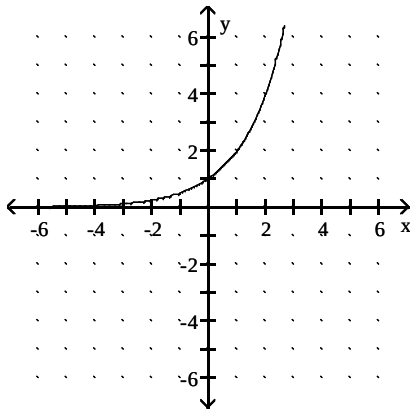


29) $f^{-1}(x) = \frac{x - 3}{2}$

30) $f^{-1}(x) = \sqrt[3]{x + 5}$

31)



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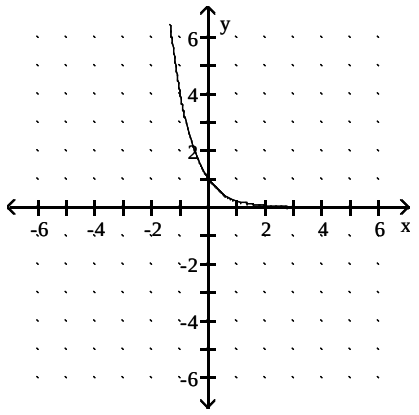

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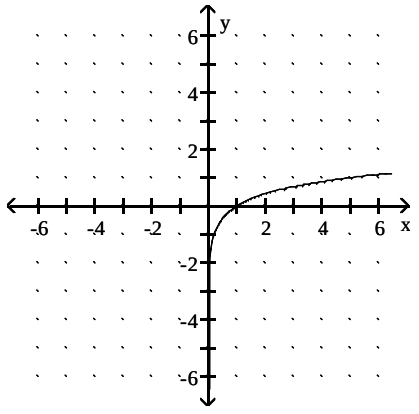

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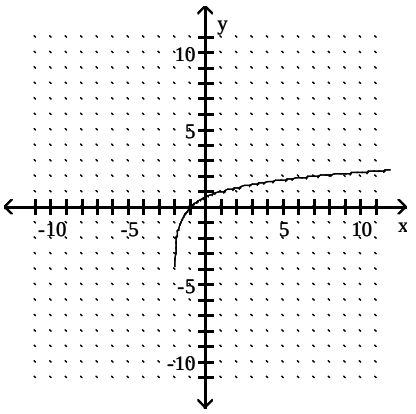

35) $\frac{1}{2401}$

36) $\frac{2}{5}$

37) 1.26×10^{-7}

38) $251{,}189 \cdot I_0$

39) $\frac{11\pi}{6}$

40) $198°$

41) $-\frac{\sqrt{3}}{2}$

42) $\frac{\sqrt{3}}{2}$

43) B

44) $\frac{2\pi}{5}$

45) $\frac{\pi}{18}$ to the left

46) odd

47) $\frac{\pi}{3}$

48) $\frac{\pi}{6}$

49) $0 \le x \le \frac{\pi}{5}$; $f^{-1}(x) = \frac{1}{5}\cos^{-1}\left(\frac{x}{6}\right)$

50) $-\frac{\pi}{8} \le x \le \frac{\pi}{8}$; $f^{-1}(x) = \frac{1}{4}\tan^{-1}\left(\frac{x}{9}\right)$