Math 260 Chapter 2 Practice set
The actual test differs.

Write the equation that results in the desired transformation.

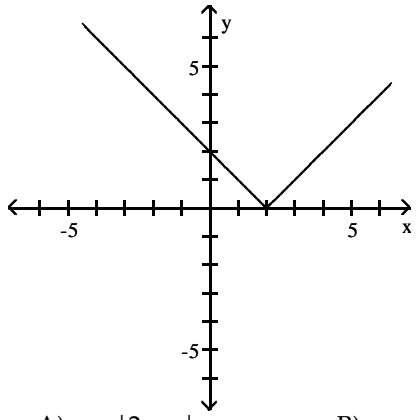
1) The graph of $y = x^3$, vertically compressed by a factor of 0.7

Solve the problem.

2) Suppose that the x–intercepts of the graph of y = f(x) are 7 and 4. What are the x–intercepts of y = 6f(x)?

Match the correct function to the graph.

3)



A) y = |2 – x| B) y = x – 2
C) y = |1 – x| D) y = |x + 2|

Solve the problem.

4) Suppose that the function y = f(x) is increasing on the interval (2, 6). Over what interval is the graph of y = f(x – 8) increasing?

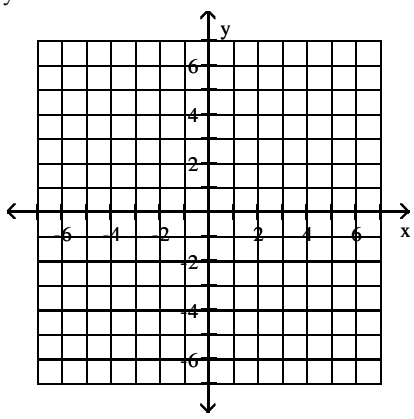
5) A rectangular sign is being designed so that the length of its base, in feet, is 2 feet less than 4 times the height, h. Express the area of the sign as a function of h.

6) Suppose that the x–intercepts of the graph of y = f(x) are 5 and 8. What are the x–intercepts of y = f(x + 9)?

7) A farmer has 1000 yards of fencing to enclose a rectangular garden. Express the area A of the rectangle as a function of the width x of the rectangle. What is the domain of A?

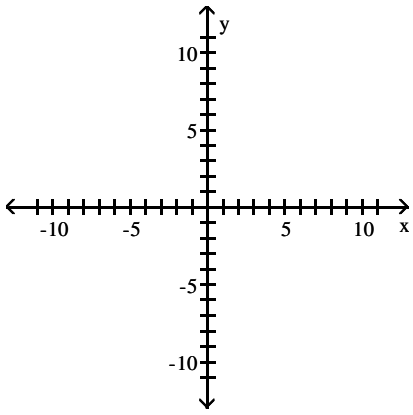
Graph the equation.

8) y = 6x – 2



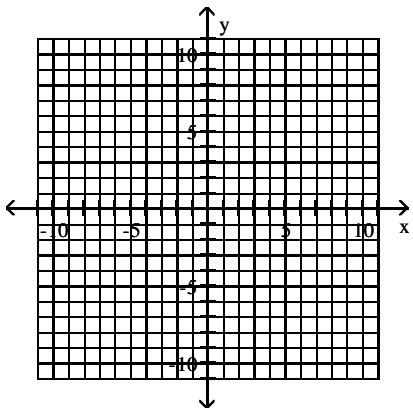
Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.

9) $f(x) = 2(x + 1)^2 + 2$



Graph the equation.

10) $y = \frac{1}{x}$



Write the equation of a sine function that has the given characteristics.

11) The graph of $y = \sqrt{x}$, shifted 7 units to the right

Find the axis of symmetry of the parabola defined by the given quadratic function.

12) $f(x) = -x^2 + 2x - 6$

Solve the problem.

13) You have 276 feet of fencing to enclose a rectangular region. Find the dimensions of the rectangle that maximize the enclosed area.

14) Write an equation in standard form of the parabola that has the same shape as the graph of $f(x) = 5x^2$, but which has a minimum of 8 at $x = 3$.

Determine whether the given quadratic function has a minimum value or maximum value. Then find the coordinates of the minimum or maximum point.

15) $f(x) = -4x^2 - 12x$

16) $f(x) = -x^2 + 2x - 8$

Find the range of the quadratic function.

17) $f(x) = 7 - (x + 5)^2$

18) $f(x) = -x^2 - 4x - 2$

Find the domain and range of the quadratic function whose graph is described.

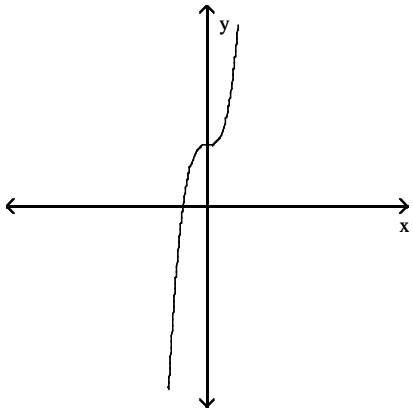
19) The maximum is 2 at $x = -1$

Find the y–intercept for the graph of the quadratic function.

20) $y + 4 = (x + 2)^2$

Does the graph represent a function that has an inverse function?

21)



Find the axis of symmetry of the parabola defined by the given quadratic function.

22) $f(x) = 11(x - 2)^2 + 6$

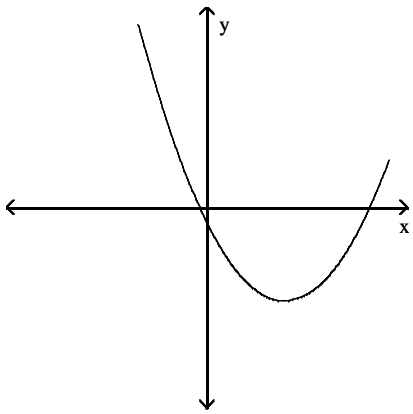
23) $f(x) = x^2 + 6$

Find the inverse of the one–to–one function.

24) $f(x) = \dfrac{7x - 1}{6}$

Does the graph represent a function that has an inverse function?

25)



Find the inverse of the one–to–one function.

26) $f(x) = 4x - 8$

Find the domain of the indicated combined function.

27) Find the domain of (fg)(x) when $f(x) = \sqrt{8x + 6}$ and $g(x) = \sqrt{9x - 4}$.

Given functions f and g, perform the indicated operations.

28) $f(x) = 7x^2 - 9x, \quad g(x) = x^2 - 7x - 18$

Find $\frac{f}{g}$.

Given functions f and g, determine the domain of f + g.

29) $f(x) = 3x + 9, \qquad g(x) = \frac{5}{x - 5}$

Given functions f and g, perform the indicated operations.

30) $f(x) = 9x - 6, \qquad g(x) = 4x - 8$

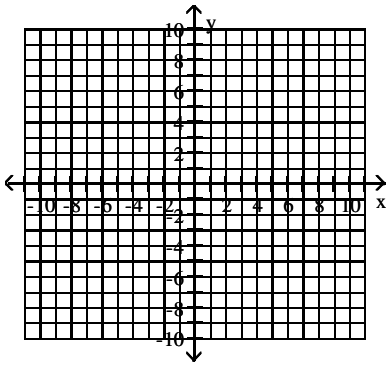
Find f – g.

31) $f(x) = 5x + 9, \qquad g(x) = 9x - 6$

Find fg.

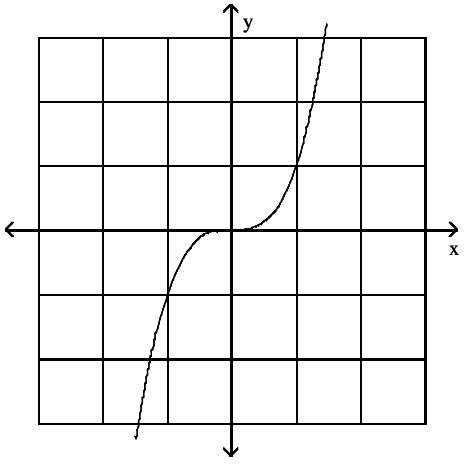
Begin by graphing the standard quadratic function $f(x) = x^2$. Then use transformations of this graph to graph the given function.

32) $h(x) = (x + 6)^2 - 3$



Use the shape of the graph to name the function.

33)



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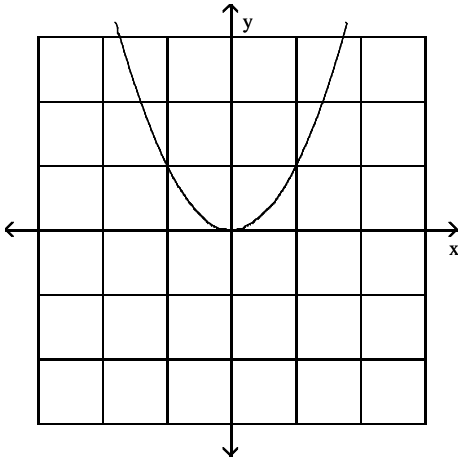
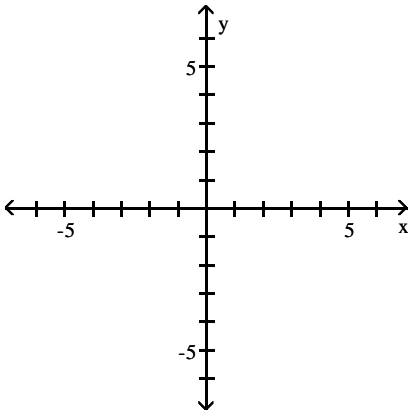


Find and simplify the difference quotient $\frac{f(x + h) - f(x)}{h}$, $h \neq 0$ for the given function.

35) $f(x) = x^2 + 7x + 3$

Graph the function.

36) $f(x) = \begin{cases} x + 4 & \text{if } x < 1 \\ -1 & \text{if } x \geq 1 \end{cases}$



Evaluate the piecewise function at the given value of the independent variable.

37) $f(x) = \begin{cases} 3x + 3 & \text{if } x < -4 \\ 4x + 2 & \text{if } x \geq -4 \end{cases}$; f(–2)

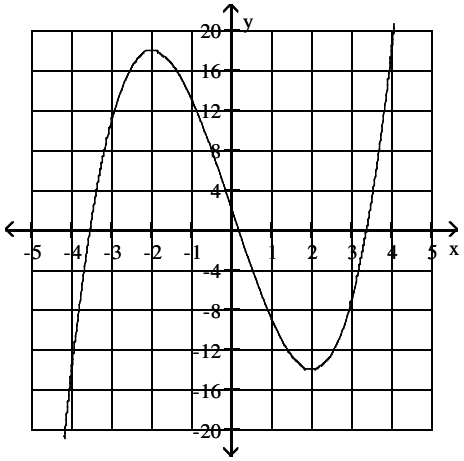
Determine whether the given function is even, odd, or neither.

38) $f(x) = x^3 + x^2 + 4$

39) $f(x) = 2x^2 + x^4$

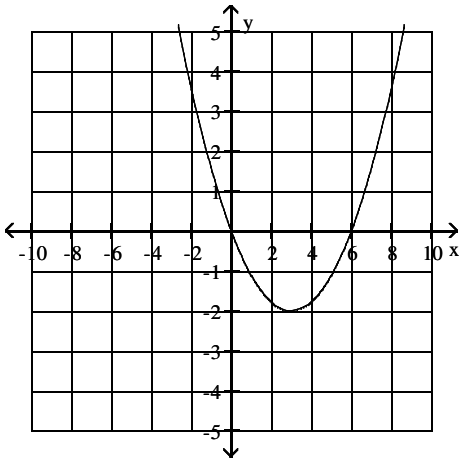
Use the graph of the given function to find any relative maxima and relative minima.

40) $f(x) = x^3 - 12x + 2$

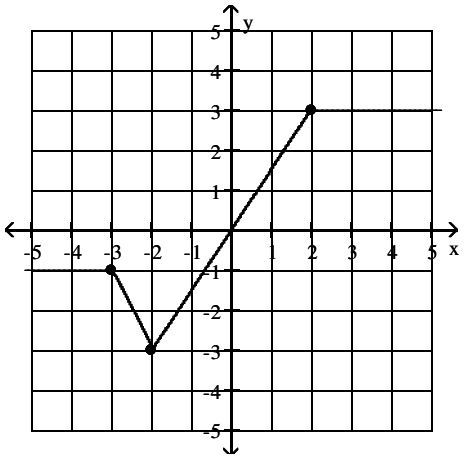


Identify the intervals where the function is changing as requested.

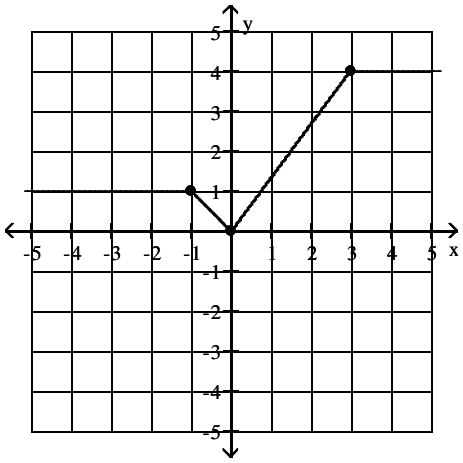
41) Decreasing



42) Decreasing



43) Constant



Evaluate the function at the given value of the independent variable and simplify.

44) $f(x) = \dfrac{x^2 + 6}{x^3 + 6x}$; $f(-3)$

45) $f(x) = 4x^2 + 4x - 5$; $f(x - 1)$

Determine whether the equation defines y as a function of x.

46) $|x| - y = 2$

47) $y = -\sqrt{x + 1}$

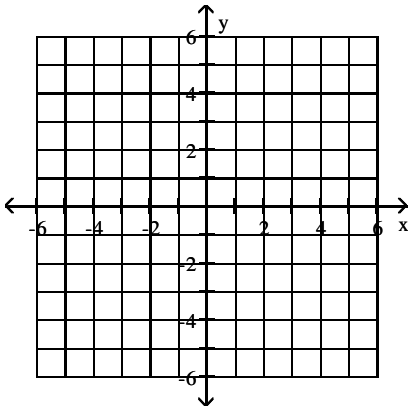
48) $x + y^3 = 64$

Give the domain and range of the relation.

49) {(11, –3), (–2, –7), (–5, –6), (–5, 6)}

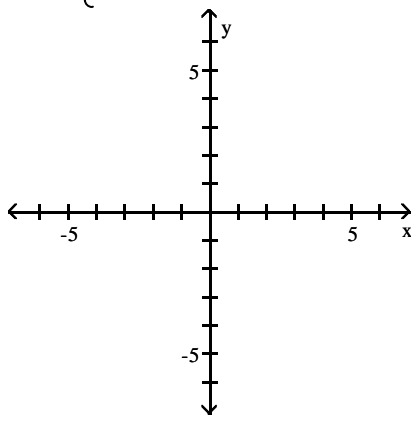
Graph the equation.

50) $y = x^3 - 5$



Graph the function. Label at least two points on the graph.

51) $f(x) = \begin{cases} -x + 3 & \text{if } x < 2 \\ 2x - 3 & \text{if } x \geq 2 \end{cases}$



Find the x–intercepts (if any) for the graph of the quadratic function.

52) $y + 4 = (x - 2)^2$

Write the equation of a function that has the given characteristics.

53) The graph of $y = \sqrt{x}$, shifted 8 units upward

54) The graph of $y = |x|$, shifted 8 units to the left

Determine whether the equation defines y as a function of x. State why or why not.

55) $x^2 + y = 9$

56) $y^2 = 7x$

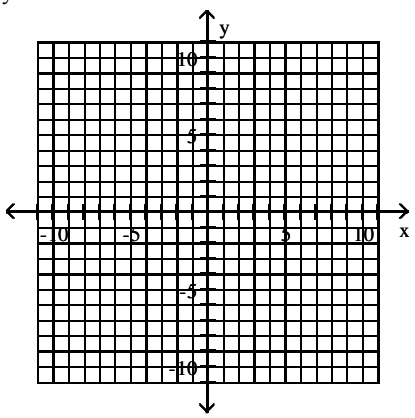
Determine whether the given function is even, odd, or neither. Use logic, not a graph.

57) $f(x) = x^4 - x^3$

58) $f(x) = x^3 - 4x$

Graph the equation.

59) $y = x^2 - 5$



Find and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$ for the given function.

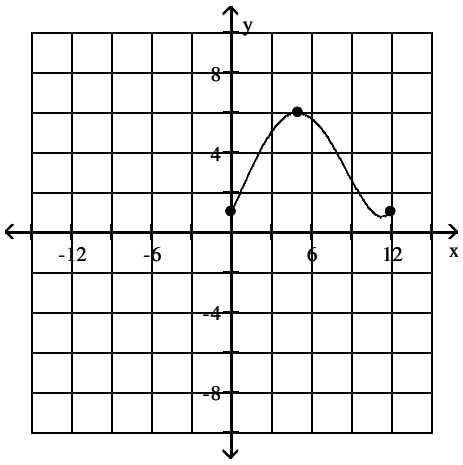
60) $f(x) = \frac{1}{8x}$

Find the domain of the function.

61) $h(x) = \frac{x - 4}{x^3 - 16x}$

Identify the intervals where the function is changing as requested.

62) Increasing



Find the inverse of the one–to–one function.

63) $f(x) = (x - 3)^3$

64) $f(x) = \frac{3}{5x + 7}$

Find the domain and range of the quadratic function whose graph is described.

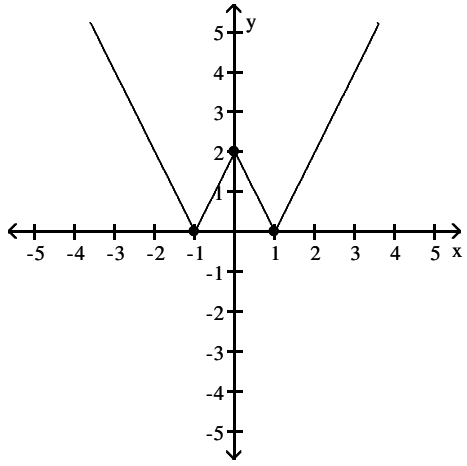
65) The vertex is (1, 12) and the graph opens down.

Given functions f and g, perform the indicated operations.

66) $f(x) = \sqrt{5x + 3}$, $g(x) = \sqrt{16x - 25}$
Find fg.

The graph of a function f is given. Use the graph to answer the question.

67) Find the numbers, if any, at which f has a relative minimum. What are the relative minima?



Evaluate the function at the given value of the independent variable and simplify.

68) $f(x) = \dfrac{x^2 + 4}{x^3 - 3x}$; $f(-3)$

For the given functions f and g , find the indicated composition.

69) $f(x) = \dfrac{4}{x + 6}$, $g(x) = \dfrac{5}{7x}$

$(f \circ g)(x)$

Suppose the point (2, 4) is on the graph of y = f(x). Find a point on the graph of the given function.

70) $y = f(x + 5)$

Given functions f and g, determine the domain of f + g.

71) $f(x) = \dfrac{3x}{x - 4}$, $g(x) = \dfrac{5}{x + 10}$

Write the equation that results in the desired transformation.

72) The graph of $y = x^2$, vertically stretched by a factor of 8

Find the y–intercept for the graph of the quadratic function.

73) $f(x) = (x - 3)^2 - 9$

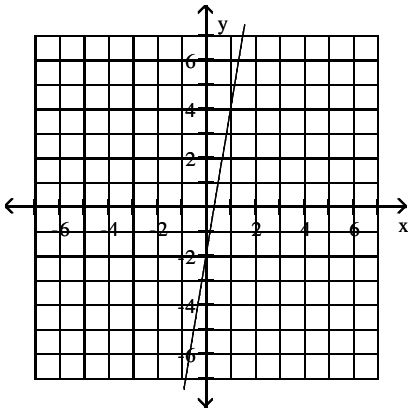
Determine whether the given quadratic function has a minimum value or maximum value. Then find the coordinates of the minimum or maximum point.

74) $f(x) = 2x^2 - 2x - 2$

Write a function.

75) Elissa wants to set up a rectangular dog run in her backyard. She has 26 feet of fencing to work with and wants to use it all. If the dog run is to be x feet long, express the area of the dog run as a function of x.

1) $y = 0.7x^3$
2) 7 and 4
3) A
4) (10, 14)
5) $A(h) = -2h + 4h^2$
6) -4 and -1
7) $A(x) = -x^2 + 500x$; $\{x \mid 0 < x < 500\}$
8)



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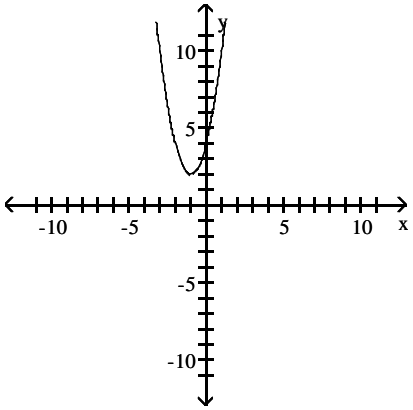

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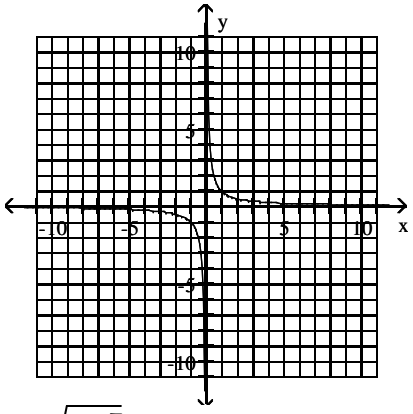


11) $y = \sqrt{x - 7}$
12) $x = 1$
13) 69 ft by 69 ft

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

15) maximum; $\left(-\frac{3}{2}, 9\right)$

16) maximum; $(1, -7)$

17) $(-\infty, 7]$

18) $(-\infty, 2]$

19) Domain: $(-\infty, \infty)$
Range: $(-\infty, 2]$

20) (0, 0)

21) Yes

22) $x = 2$

23) $x = 0$

24) $f^{-1}(x) = \frac{6x + 1}{7}$

25) No

26) $f^{-1}(x) = \frac{x + 8}{4}$

27) Domain: $\left[\frac{4}{9}, \infty\right)$

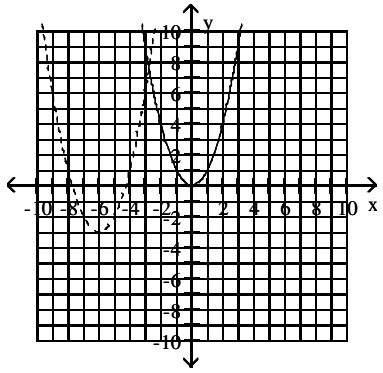
28) $\frac{7x^2 - 9x}{x^2 - 7x - 18}$

29) $(-\infty, 5)$ or $(5, \infty)$

30) $5x + 2$

31) $45x^2 + 51x - 54$

32)

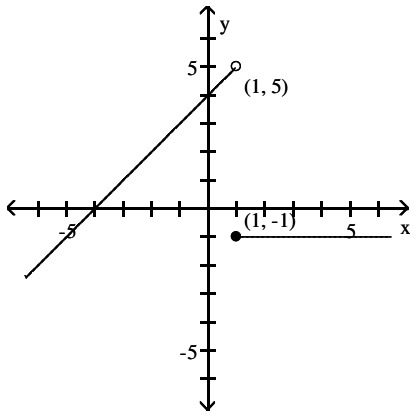


33) Standard cubic function

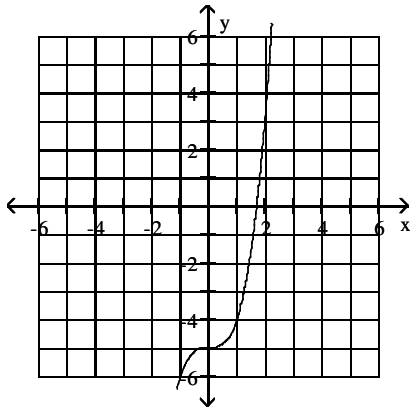
34) Standard quadratic function

35) $2x + h + 7$

36)



37) –6
38) Neither
39) Even
40) minimum: (2, –14); maximum: (–2, 18)
41) (–∞, 3)
42) (–3, –2)
43) (–∞, –1) or (3, ∞)
44) $-\frac{1}{3}$
45) $4x^2 - 4x - 5$
46) y is a function of x
47) y is a function of x
48) y is a function of x
49) domain = {11, –2, –5}; range = {–3, –7, –6, 6}
50)



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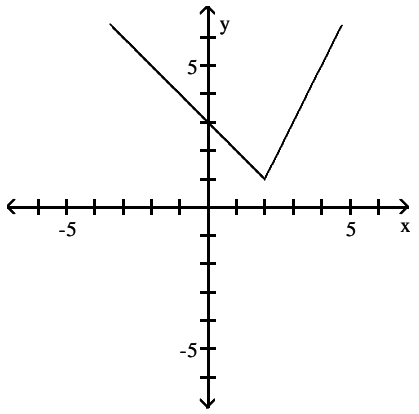


52) (0, 0) and (4, 0)

53) $y = \sqrt{x} + 8$

54) $y = |x + 8|$

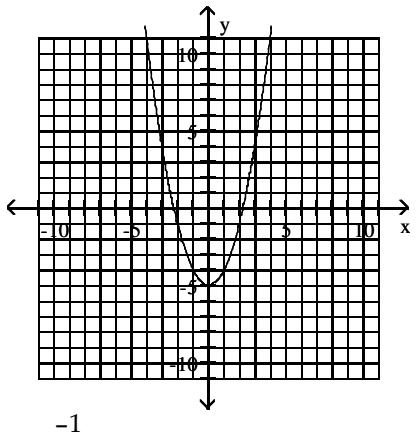
55) y is a function of x

56) y is not a function of x

57) Neither

58) Odd

59)



60) $\frac{-1}{8x\,(x + h)}$

61) $(-\infty, -4) \cup (-4, 0) \cup (0, 4) \cup (4, \infty)$

62) (0, 5)

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

64) $f^{-1}(x) = \frac{3}{5x} - \frac{7}{5}$

65) Domain: $(-\infty, \infty)$
Range: $(-\infty, 12]$

66) $(\sqrt{5x + 3})(\sqrt{16x - 25})$

67) f has a relative minimum at $x = -1$ and 1; the relative minimum is 0

68) $-\frac{13}{18}$

69) $\frac{28x}{5 + 42x}$

70) (–3, 4)
71) (–∞, –10) or (–10, 4) or (4, ∞)
72) $y = 8x^2$
73) (0, 0)
74) minimum; $\left(\frac{1}{2}, -\frac{5}{2}\right)$
75) $A(x) = 13x - x^2$