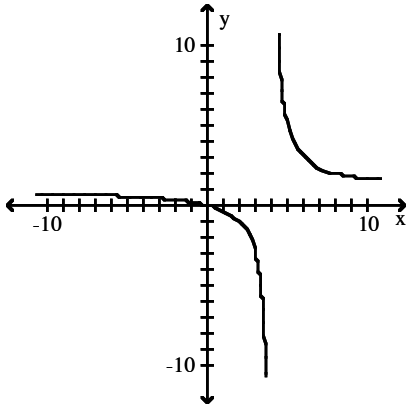


**SHORT ANSWER.** Write the word or phrase that best completes each statement or answers the question.

Determine the intervals of the domain over which the function is continuous.

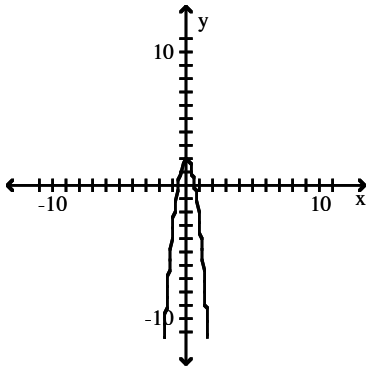
1)



1) \_\_\_\_\_

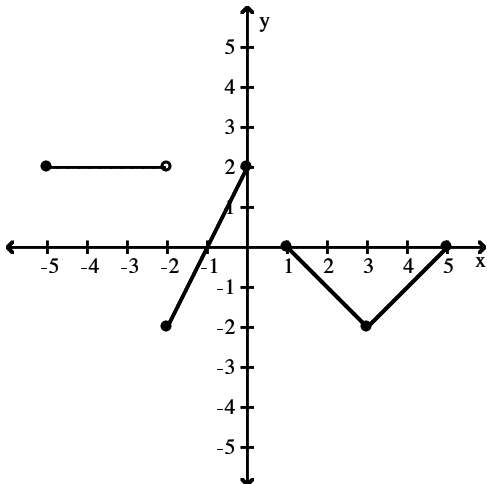
Determine the intervals on which the function is increasing, decreasing, and constant.

2)



2) \_\_\_\_\_

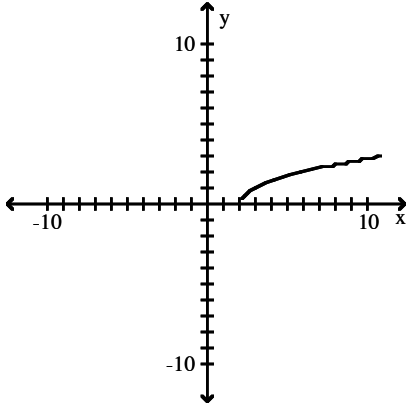
3)



3) \_\_\_\_\_

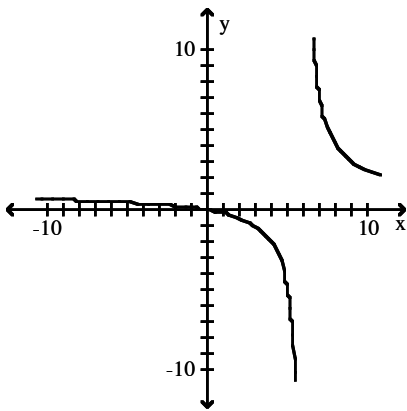
Find the domain and the range for the function.

4)



4) \_\_\_\_\_

5)



5) \_\_\_\_\_

Determine if the function is increasing or decreasing over the interval indicated.

6)  $f(x) = (x^2 - 9)^2$ ;  $(3, \infty)$

6) \_\_\_\_\_

7)  $f(x) = \frac{1}{x^2 + 1}$ ;  $(-\infty, 0)$

7) \_\_\_\_\_

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

8)  $f(x) = 3x^2 - 2$

8) \_\_\_\_\_

9)  $f(x) = (x + 7)(x + 6)$

9) \_\_\_\_\_

10)  $f(x) = |x^2 + x|$

10) \_\_\_\_\_

Determine whether the graph of the given function is symmetric with respect to the y-axis, symmetric with respect to the origin, or neither.

11)  $f(x) = |2x| + 3$

11) \_\_\_\_\_

$$12) f(x) = x + \frac{1}{x^2}$$

12) \_\_\_\_\_

**Write an equation that results in the indicated translation.**

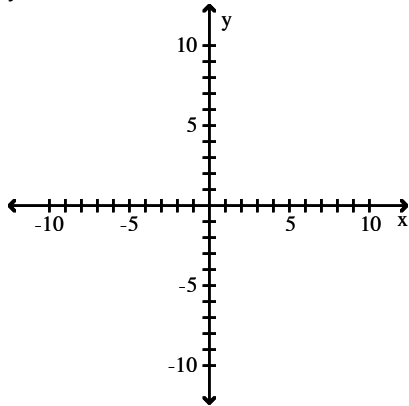
13) The absolute value function, shifted 7 units upward

13) \_\_\_\_\_

**Use translations of one of the basic functions to sketch a graph of  $y = f(x)$  by hand.**

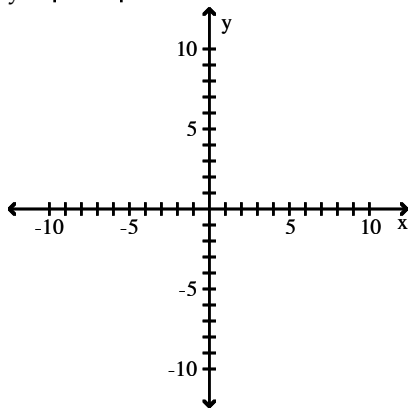
$$14) y = x^2 - 4$$

14) \_\_\_\_\_



$$15) y = |x - 4|$$

15) \_\_\_\_\_



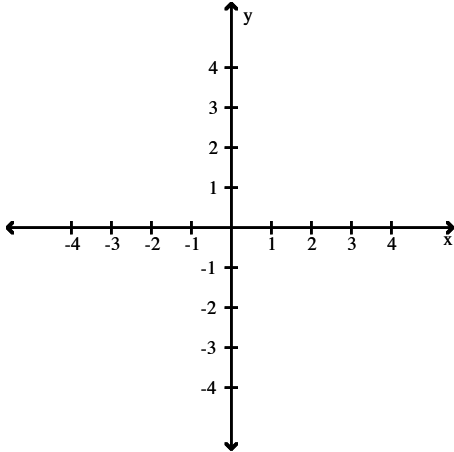
**Write an equation that results in the indicated translation.**

16) The square root function, shifted 4 units to the left

16) \_\_\_\_\_

Use translations of one of the basic functions to sketch a graph of  $y = f(x)$  by hand.

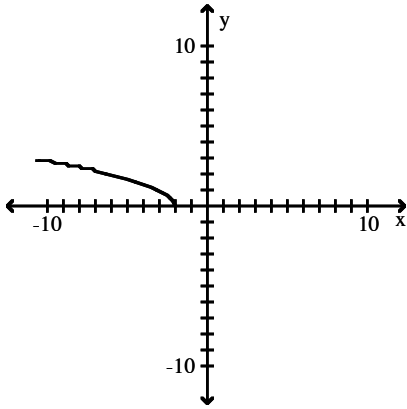
17)  $y = \sqrt{x+2} + 1$



17) \_\_\_\_\_

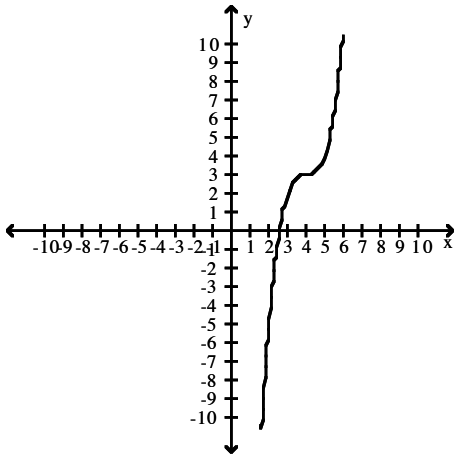
Determine the domain and range of the function from the graph.

18)



18) \_\_\_\_\_

19)

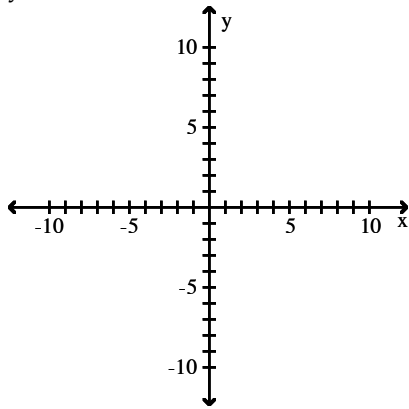


19) \_\_\_\_\_

Use translations of one of the basic functions defined by  $y = x^2$ ,  $y = x^3$ ,  $y = \sqrt{x}$ , or  $y = |x|$  to sketch a graph of  $y = f(x)$  by hand. Do not use a calculator.

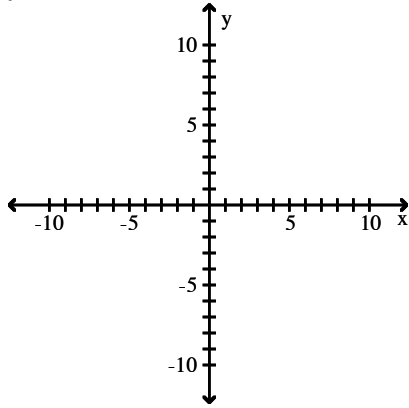
20)  $y = \sqrt{x-1}$

20) \_\_\_\_\_



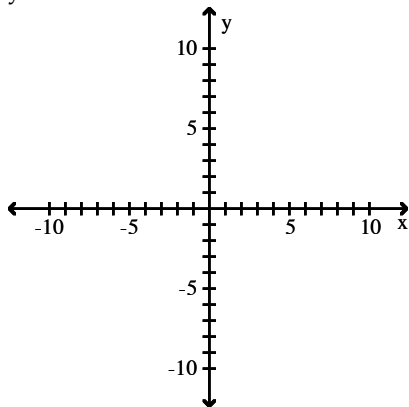
21)  $y = (x-3)^2 - 2$

21) \_\_\_\_\_



22)  $y = \sqrt{x+3} - 1$

22) \_\_\_\_\_

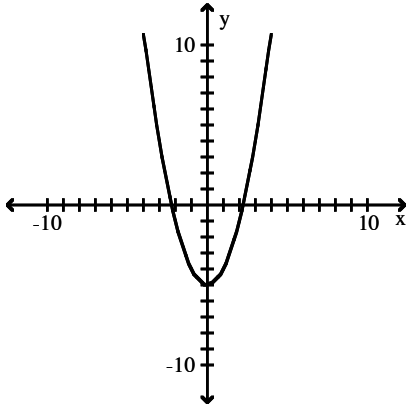


**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

The graph is a translation of one of the basic functions defined by  $y = x^2$ ,  $y = x^3$ ,  $y = \sqrt{x}$ , or  $y = |x|$ . Find the equation that defines the function.

23)

23) \_\_\_\_\_



A)  $y = (x - 5)^2$

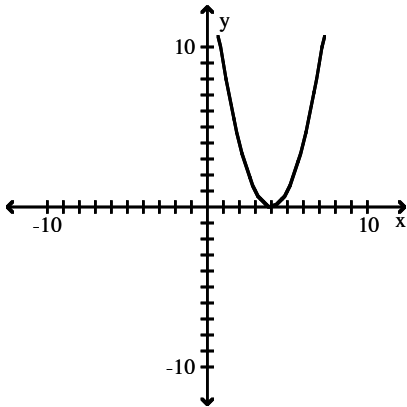
B)  $y = (x + 5)^2$

C)  $y = x^2 - 5$

D)  $y = (x - 5)^2 + 2$

24)

24) \_\_\_\_\_



A)  $y = (x - 4)^2$

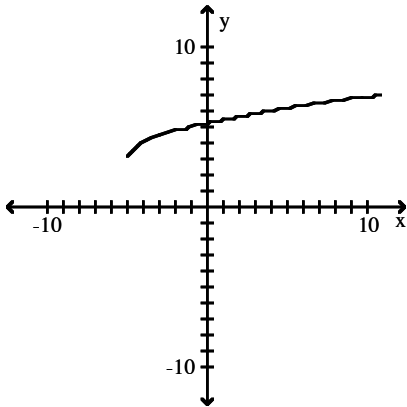
B)  $y = (x - 4)^2 + 2$

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

D)  $y = x^2 - 4$

25)

25) \_\_\_\_\_



A)  $y = \sqrt{x + 3}$

B)  $y = \sqrt{x + 5}$

C)  $y = \sqrt{x - 5}$

D)  $y = \sqrt{x + 5} + 3$

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

**Write the equation that results in the desired transformation.**

26) The cubing function, vertically shrunk by a factor of 0.9

26) \_\_\_\_\_

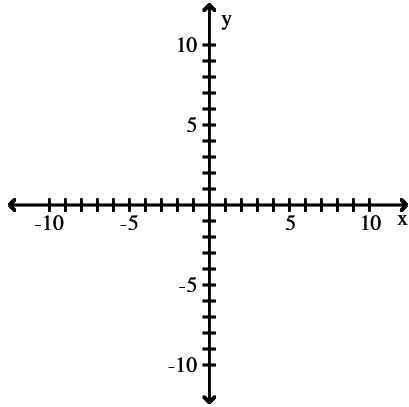
27) The absolute value function, vertically stretched by a factor of 2.4 and reflected across the x-axis

27) \_\_\_\_\_

**Use transformations of graphs to sketch the graphs of  $y_1$  and  $y_2$ . Graph  $y_2$  as a dashed curve.**

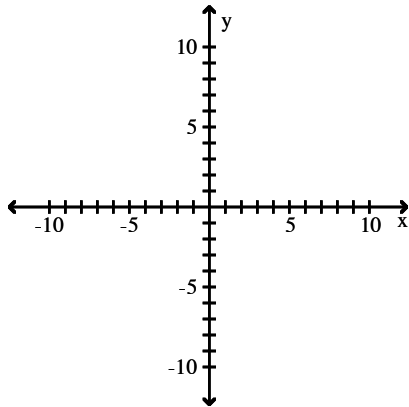
28)  $y_1 = |x|$ ;  $y_2 = |x - 2|$

28) \_\_\_\_\_



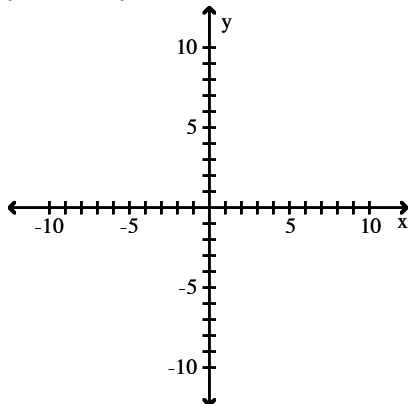
29)  $y_1 = x^3$ ;  $y_2 = (x + 5)^3$

29) \_\_\_\_\_



30)  $y_1 = \sqrt[3]{x}$ ,  $y_2 = \sqrt[3]{-x + 3}$

30) \_\_\_\_\_



Fill in each blank with the appropriate response.

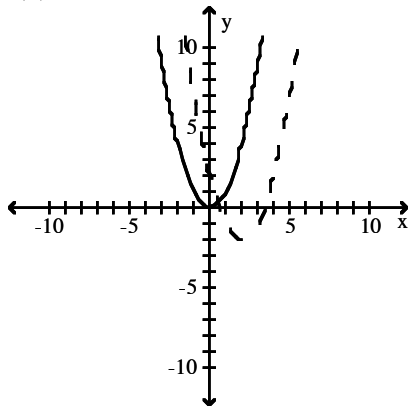
- 31) The graph of  $y = -5(x+3)^2 - 8$  can be obtained from the graph of  $y = x^2$  by shifting horizontally \_\_\_ units to the \_\_\_\_\_, vertically stretching by a factor of \_\_\_, reflecting across the \_\_\_-axis, and shifting vertically \_\_\_ units in the \_\_\_\_\_ direction. 31) \_\_\_\_\_

Give the equation of the function whose graph is described.

- 32) The graph of  $y = x^2$  is shifted 2 units to the left. This graph is then vertically shrunk by a factor of  $\frac{1}{5}$  and reflected across the  $x$ -axis. Finally, the graph is shifted 8 units downward. 32) \_\_\_\_\_
- 33) The graph of  $y = |x|$  is reflected across the  $y$ -axis. This graph is then vertically stretched by a factor of 7.1. Finally, the graph is shifted 5 units downward. 33) \_\_\_\_\_

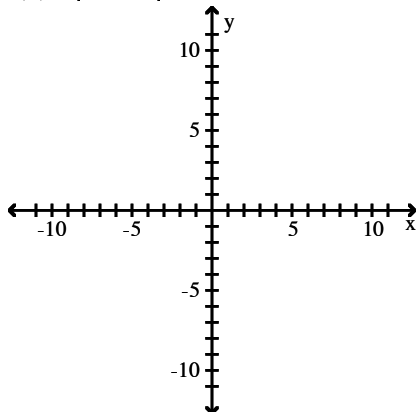
The graph of the given function is drawn with a solid line. The graph of a function,  $g(x)$ , transformed from this one is drawn with a dashed line. Find a formula for  $g(x)$ .

- 34)  $f(x) = x^2$  34) \_\_\_\_\_



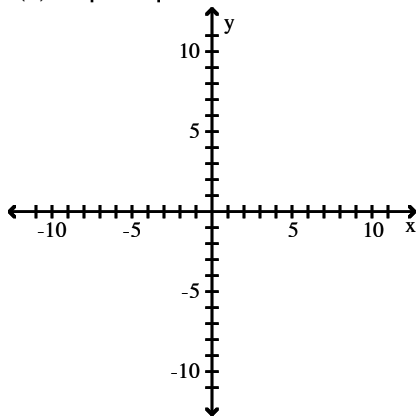
Use transformations to graph the function.

- 35)  $f(x) = |-3 - x|$  35) \_\_\_\_\_



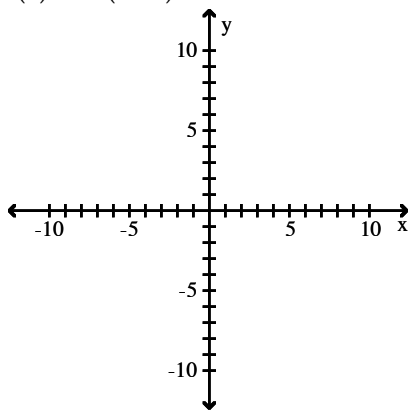


36)  $f(x) = 4|x - 5| - 5$



36) \_\_\_\_\_

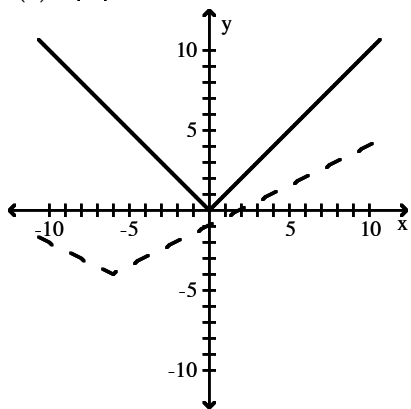
37)  $f(x) = -2(x + 3)^2 + 4$



37) \_\_\_\_\_

The graph of the given function is drawn with a solid line. The graph of a function,  $g(x)$ , transformed from this one is drawn with a dashed line. Find a formula for  $g(x)$ .

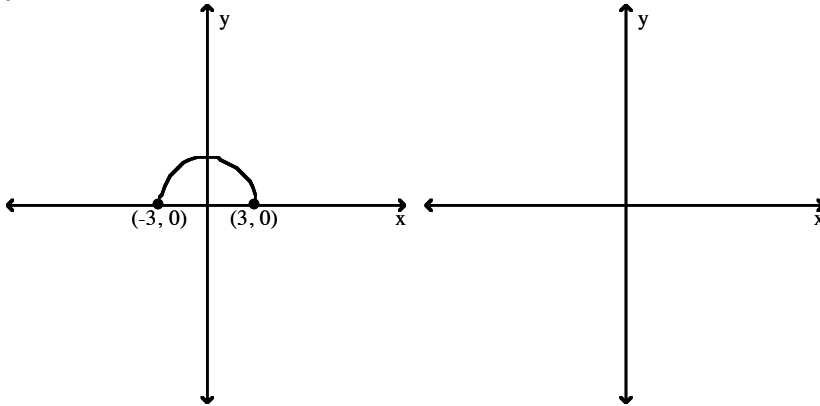
38)  $f(x) = |x|$



38) \_\_\_\_\_

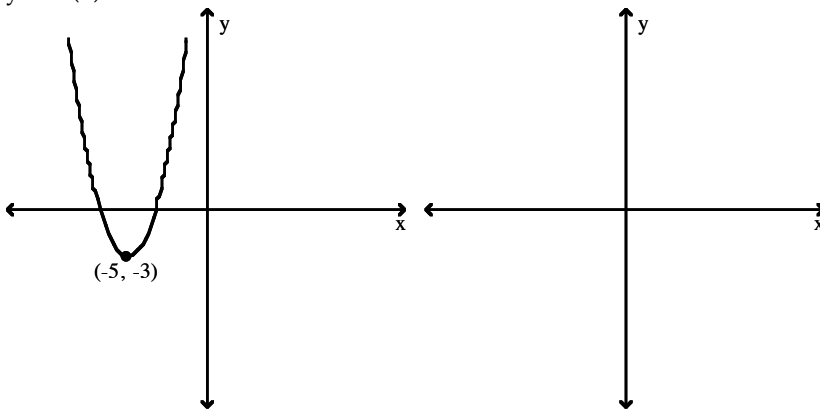
Use the accompanying graph of  $y = f(x)$  to sketch the graph of the indicated function.

39)  $y = f(-x)$



39) \_\_\_\_\_

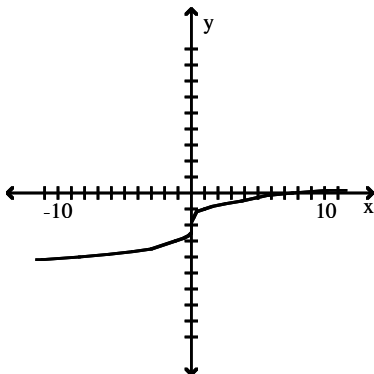
40)  $y = -f(x)$



40) \_\_\_\_\_

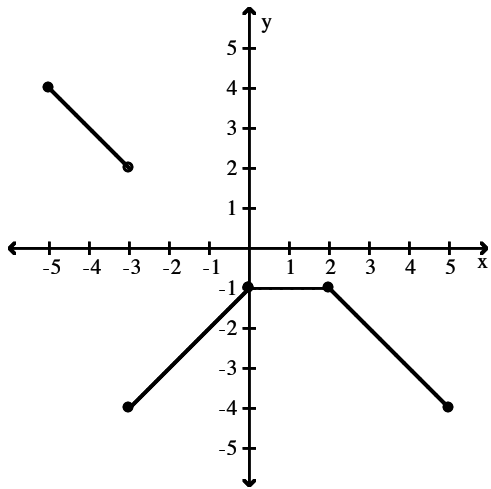
Determine the intervals on which the function is increasing, decreasing, and constant.

41)



41) \_\_\_\_\_

42)

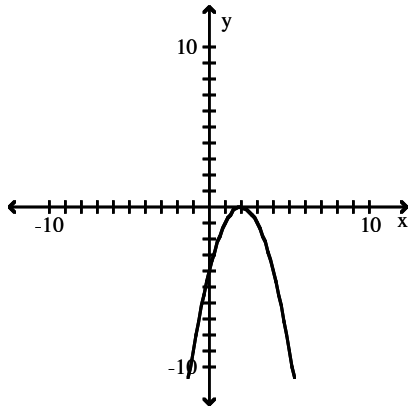


42) \_\_\_\_\_

**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.

The figure shows a transformation of the graph of  $y = x^2$ . Write the equation for the graph.

43)



43) \_\_\_\_\_

A)  $g(x) = -x^2 - 2$

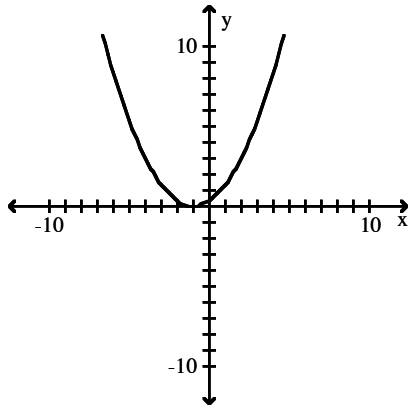
B)  $g(x) = -x^2 + 2$

C)  $g(x) = (x + 2)^2$

D)  $g(x) = -(x - 2)^2$

44)

44) \_\_\_\_\_



A)  $g(x) = \frac{1}{3}(x+1)^2$

B)  $g(x) = (x-1)^2$

C)  $g(x) = \frac{1}{3}x^2 - 1$

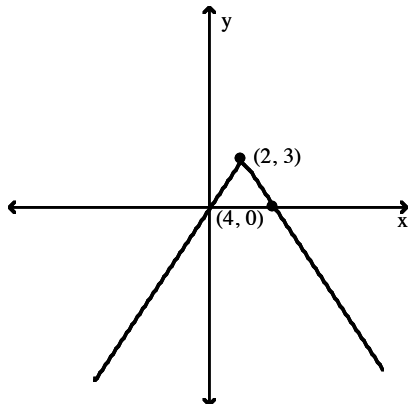
D)  $g(x) = \frac{1}{3}x^2 + 1$

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

The graph of the function  $y = f(x)$  is given below. Sketch the graph of  $y = |f(x)|$ .

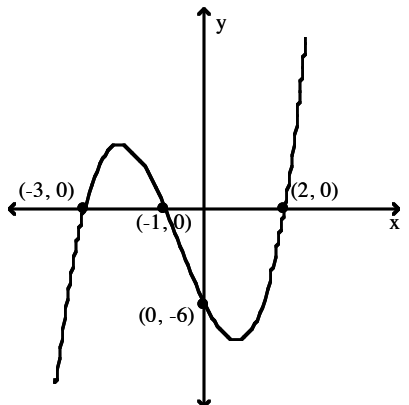
45)

45) \_\_\_\_\_



46)

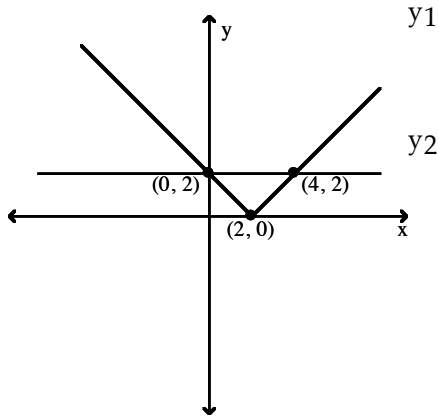
46) \_\_\_\_\_



Use the graph, along with the indicated points, to give the solution set of the equation or inequality.

47)  $y_1 > y_2$

47) \_\_\_\_\_



**Solve the equation.**

48)  $|-3x + 1| = 12$

48) \_\_\_\_\_

49)  $|7x + 2| + 7 = 14$

49) \_\_\_\_\_

**Solve the inequality.**

50)  $|2 - 3x| \leq 11$

50) \_\_\_\_\_

51)  $|x + 6| - 2 > 16$

51) \_\_\_\_\_

**Solve the equation.**

52)  $|2x + 8| = |x + 9|$

52) \_\_\_\_\_

**Solve the problem.**

53) The formula to find Celsius temperature, C, given Fahrenheit temperature, F, is

53) \_\_\_\_\_

$$C = \frac{5}{9}(F - 32). \text{ If the processing temperature of a chemical ranges from } 302^\circ\text{F to } 347^\circ\text{F,}$$

inclusive, then what is the range of its temperature in degrees Celsius?

54) The average annual growth rate of a coral reef in inches satisfies the inequality

54) \_\_\_\_\_

$$|x - 2.74| \leq 2.17. \text{ What range of growth corresponds to this inequality?}$$

**Find the requested value.**

55)

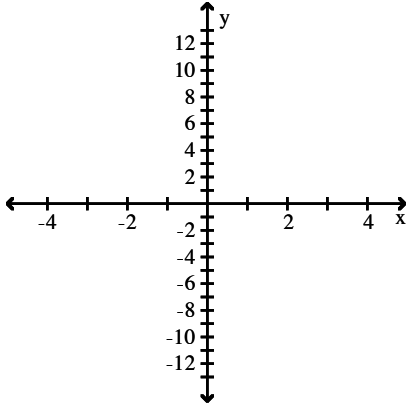
55) \_\_\_\_\_

$$f(7) \text{ for } f(x) = \begin{cases} 4x + 6 & \text{if } x \leq 0 \\ 5 - 6x & \text{if } 0 < x < 6 \\ x & \text{if } x \geq 6 \end{cases}$$

Graph the function.

56)

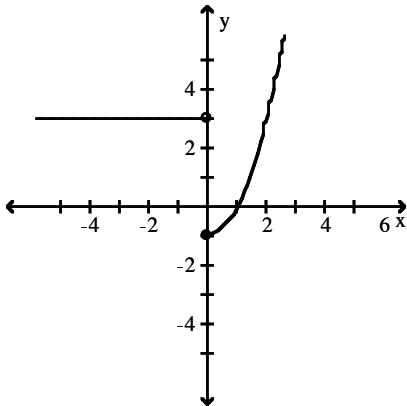
$$f(x) = \begin{cases} x^2 - 9 & \text{if } x < -1 \\ 0 & \text{if } -1 \leq x \leq 1 \\ x^2 + 9 & \text{if } 1 < x \end{cases}$$



56) \_\_\_\_\_

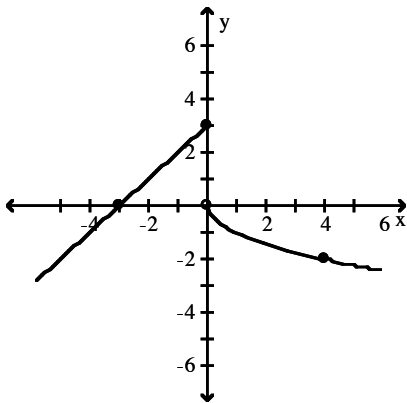
Give a formula for a piecewise-defined function  $f$  for the graph shown.

57)



57) \_\_\_\_\_

58)



58) \_\_\_\_\_

Find the requested composition or operation.

59)  $f(x) = 4x^2 + 2x + 4$ ,  $g(x) = 2x - 8$

Find  $(g \circ f)(x)$ .

59) \_\_\_\_\_

60)  $f(x) = \frac{7}{x-3}$ ,  $g(x) = \frac{4}{3x}$

Find  $(f \circ g)(x)$ .

60) \_\_\_\_\_

Perform the requested composition or operation.

61) Find  $(f - g)(-2)$  when  $f(x) = -4x^2 + 6$  and  $g(x) = x - 6$ .

61) \_\_\_\_\_

62) Find  $(fg)(3)$  when  $f(x) = x - 1$  and  $g(x) = -2x^2 + 13x - 7$ .

62) \_\_\_\_\_

Find the specified domain.

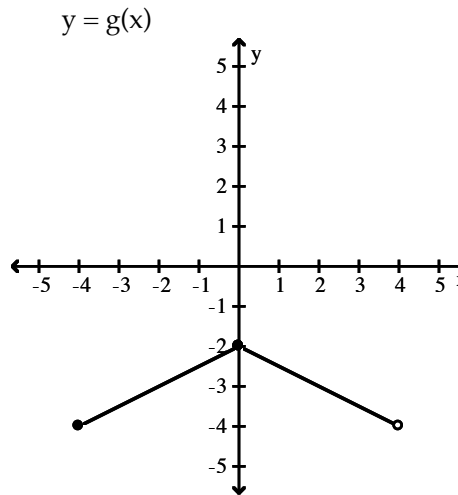
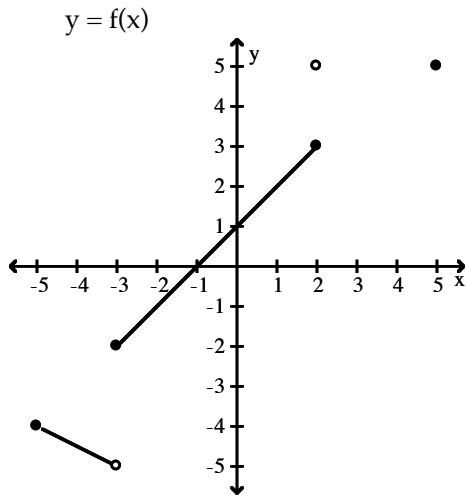
63) For  $f(x) = 2x - 5$  and  $g(x) = \sqrt{x+2}$ , what is the domain of  $(f \circ g)$ ?

63) \_\_\_\_\_

Use the graphs to evaluate the expression.

64)  $f(-1) - g(-2)$

64) \_\_\_\_\_



Find the specified domain.

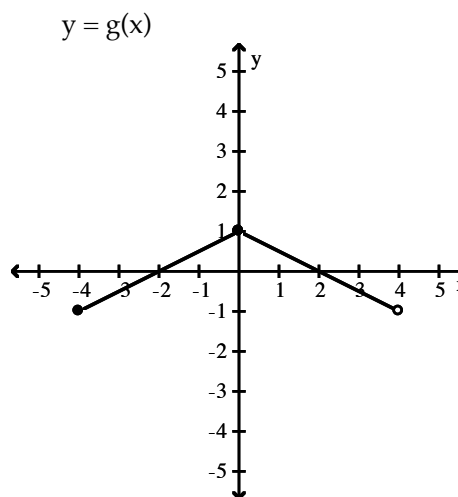
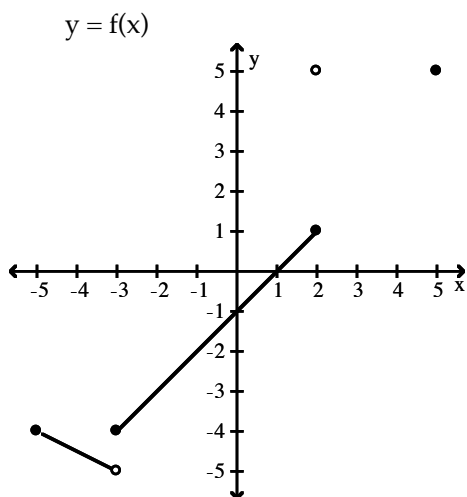
65) For  $f(x) = x^2 - 64$  and  $g(x) = 2x + 3$ , what is the domain of  $\left(\frac{g}{f}\right)$ ?

65) \_\_\_\_\_

Use the graphs to evaluate the expression.

66)  $(f \circ g)(-4)$

66) \_\_\_\_\_



Determine whether  $(f \circ g)(x) = x$  and whether  $(g \circ f)(x) = x$ .

67)  $f(x) = \sqrt[5]{x-4}$ ,  $g(x) = x^5 + 4$

67) \_\_\_\_\_

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

68) \_\_\_\_\_