

Name \_\_\_\_\_

**Find the slope of the line passing through the pair of points or state that the slope is undefined.**

1) (6, 4) and (-5, -5)

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

2) (7, 4) and (9, 1)

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

3) (-3, -5) and (-3, 3)

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

4) (5, -3) and (5, -9)

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

5) (-9, 7) and (4, 7)

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

6) (-7, -4) and (8, -4)

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

**Find the midpoint of the line segment with the given end points.**

7) (8, -3) and (9, -4)

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

8) (5, 9) and (8, 2)

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

9)  $(7, -2)$  and  $(-8, 3)$

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

10)  $\left(\frac{4}{5}, -\frac{3}{5}\right)$  and  $\left(-\frac{7}{5}, \frac{6}{5}\right)$

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

11)  $\left(\frac{1}{2}, 2\right)$  and  $\left(1, -\frac{1}{2}\right)$

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

12)  $(-8\sqrt{2}, 6\sqrt{2})$  and  $(-5\sqrt{2}, 11\sqrt{2})$

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

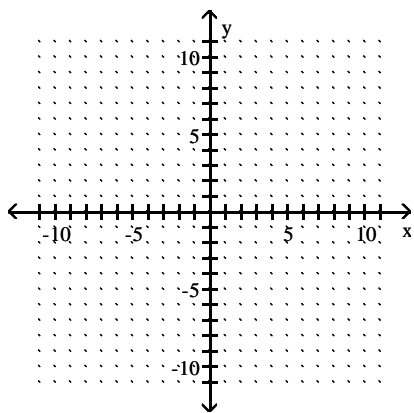
13)  $(-8\sqrt{6}, 4\sqrt{2})$  and  $(-3\sqrt{6}, 7\sqrt{2})$

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

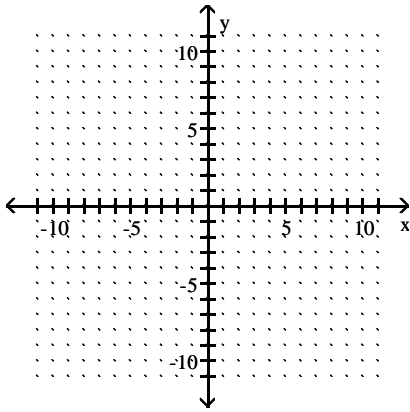
**Complete the square and write the equation in standard form. Then give the center and radius of the circle and graph the equation.**

14)  $x^2 + y^2 - 4x + 2y - 31 = 0$

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

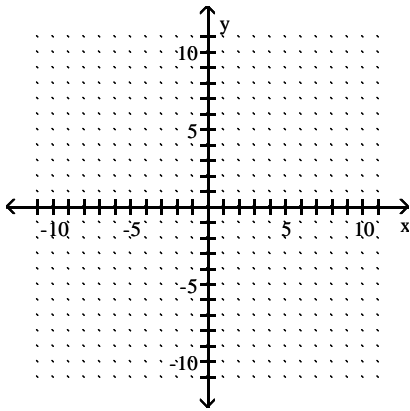


15)  $x^2 + y^2 - 8x + 10y + 32 = 0$



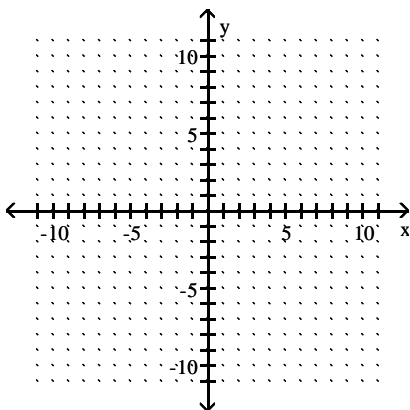
15) \_\_\_\_\_

16)  $x^2 + y^2 + 6x - 12y + 41 = 0$



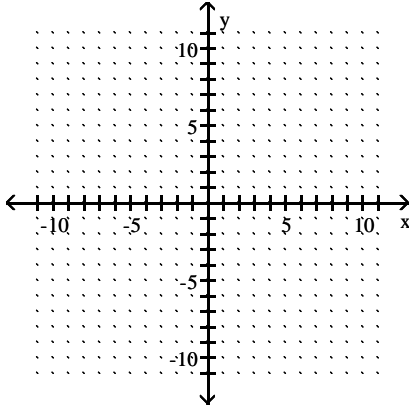
16) \_\_\_\_\_

17)  $x^2 + y^2 + 4x - 8y - 5 = 0$



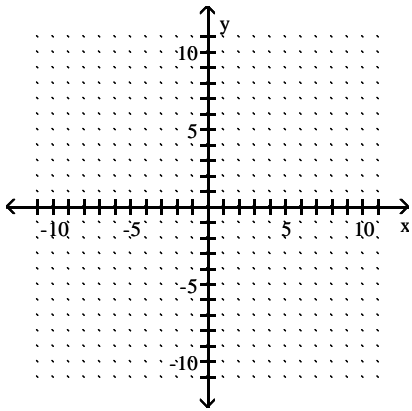
17) \_\_\_\_\_

18)  $x^2 + y^2 - 8y + 7 = 0$



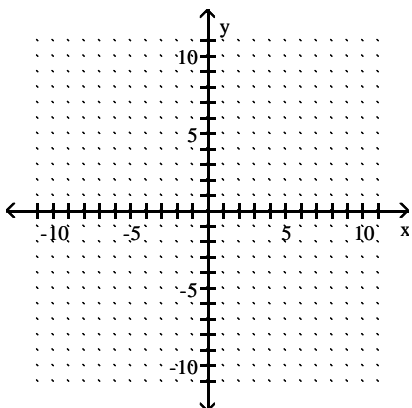
18) \_\_\_\_\_

19)  $x^2 + y^2 + 2y - 15 = 0$



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

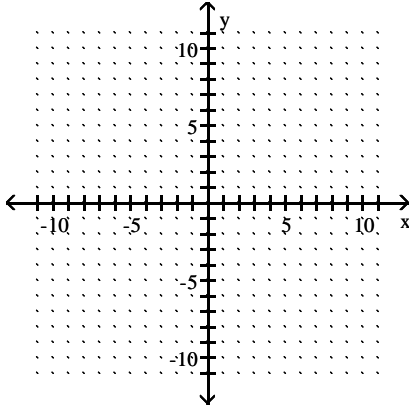
20)  $x^2 + y^2 - 4x - 60 = 0$



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

21)  $x^2 + y^2 - 8x + 15 = 0$

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



**Decide whether the relation is a function.**

22)  $\{(-1, 5), (3, 9), (4, -7), (7, 2), (11, -1)\}$

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

23)  $\{(-6, 9), (-3, 1), (3, -1), (3, 9)\}$

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

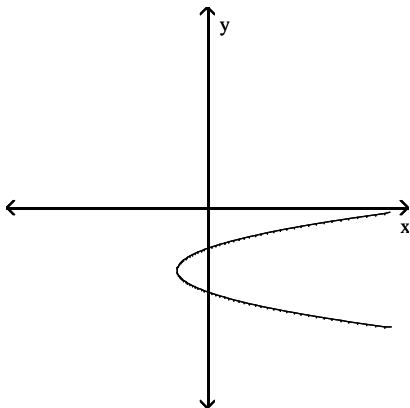
24)  $\{(-5, -2), (-2, 4), (2, 4), (7, 6)\}$

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

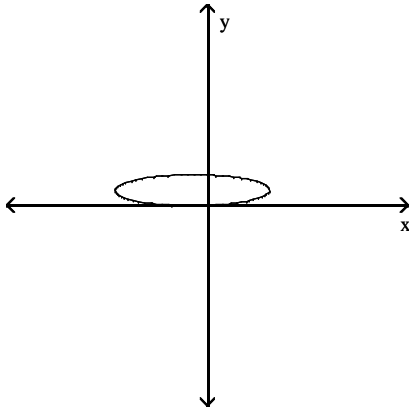
**Use the vertical line test on the graph to determine if y is a function of x.**

25)

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



26)

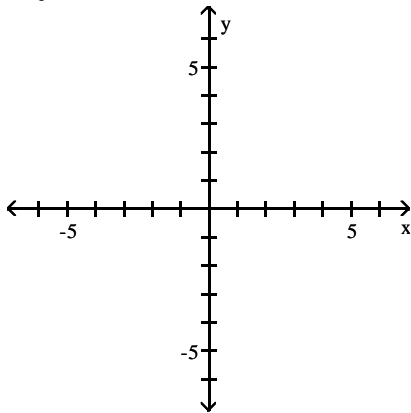


26) \_\_\_\_\_

**Graph the function.**

27)

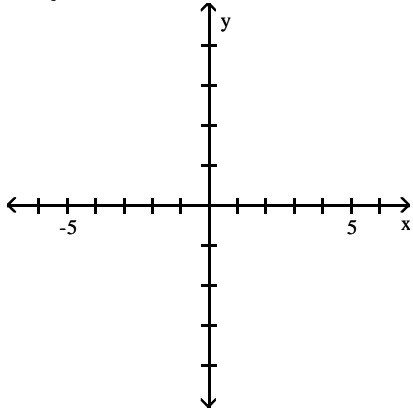
$$f(x) = \begin{cases} -x + 3 & \text{if } x < 2 \\ 2x - 3 & \text{if } x \geq 2 \end{cases}$$



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

28)

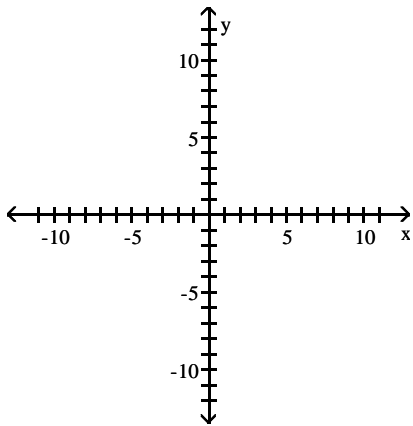
$$f(x) = \begin{cases} -x + 2 & x < 0 \\ \sqrt{x} + 3 & x \geq 0 \end{cases}$$



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

29)

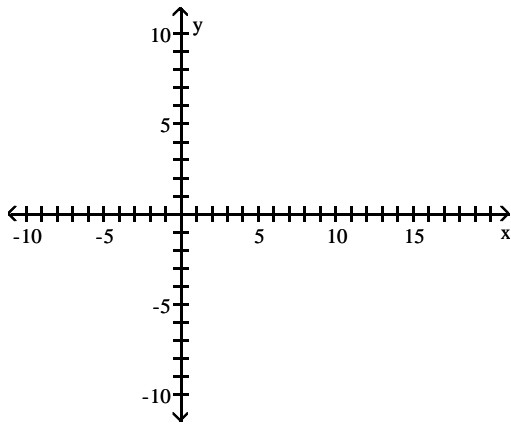
$$f(x) = \begin{cases} x + 3 & \text{if } -7 \leq x < 2 \\ -4 & \text{if } x = 2 \\ -x + 4 & \text{if } x > 2 \end{cases}$$



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

30)

$$f(x) = \begin{cases} 1 & \text{if } -3 \leq x < 5 \\ |x| & \text{if } 5 \leq x < 7 \\ \sqrt{x} & \text{if } 7 \leq x \leq 13 \end{cases}$$

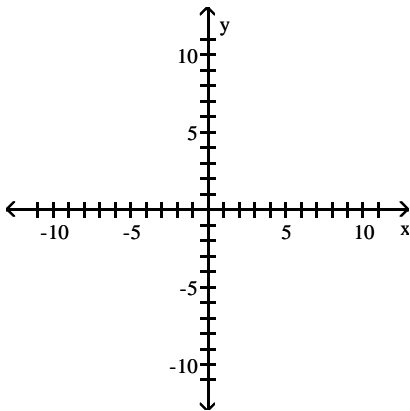


30) \_\_\_\_\_

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

31)  $f(x) = (x + 5)^3 + 2$

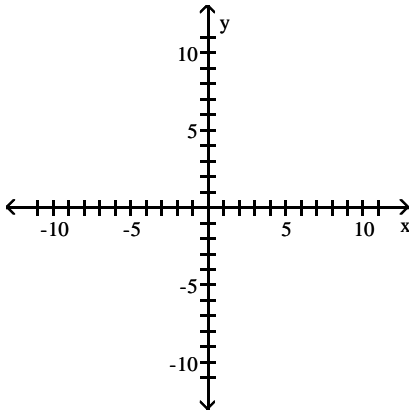
31) \_\_\_\_\_





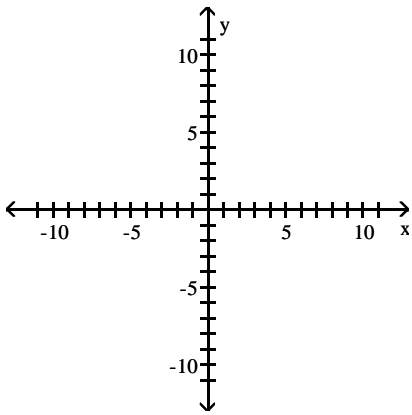
32)  $f(x) = (x - 1)^3 + 5$

32) \_\_\_\_\_



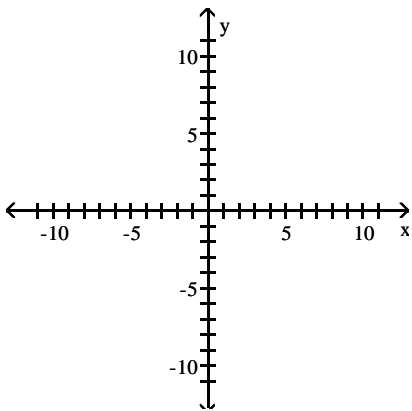
33)  $f(x) = \sqrt{x} + 4$

33) \_\_\_\_\_



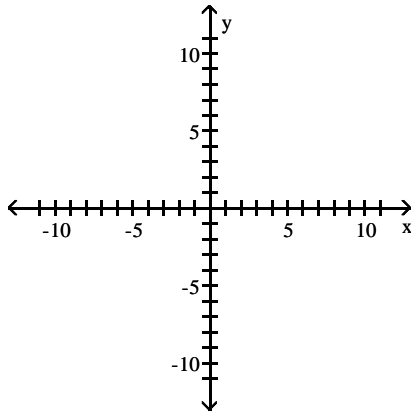
34)  $f(x) = \sqrt{x} - 2$

34) \_\_\_\_\_



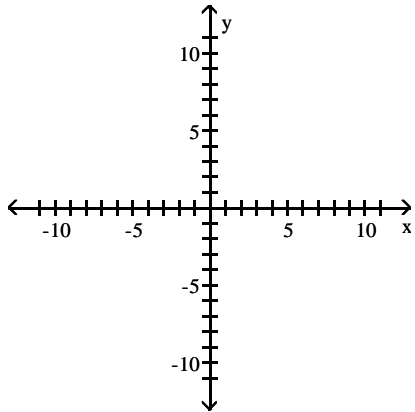
35)  $f(x) = \sqrt{x+4} - 5$

35) \_\_\_\_\_



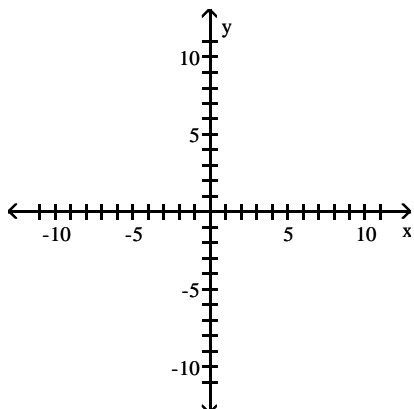
36)  $f(x) = \sqrt{x+2} + 5$

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

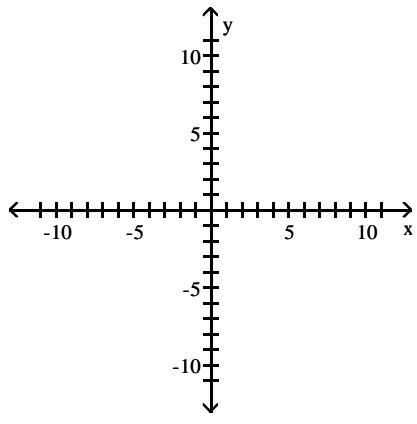


37)  $f(x) = |x| - 2$

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

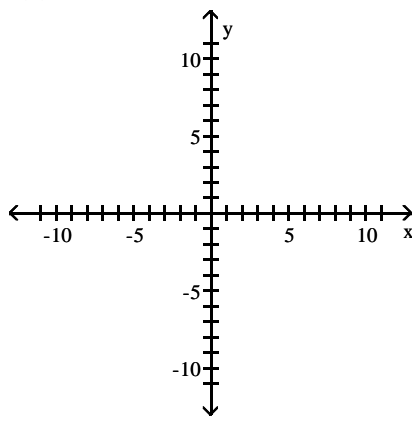


38)  $f(x) = |x| + 4$



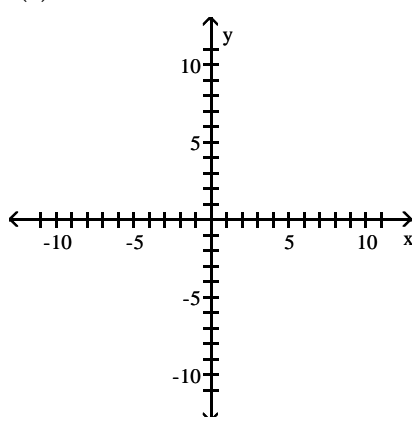
38) \_\_\_\_\_

39)  $f(x) = |x + 3| + 7$



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

40)  $f(x) = |x - 4| + 4$



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

For the given functions  $f$  and  $g$ , find the requested function and state its domain.

41)  $f(x) = 5x - 2$ ;  $g(x) = 7x - 3$

Find  $f - g$ .

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

42)  $f(x) = 5x - 7$ ;  $g(x) = 7x - 5$

Find  $f - g$ .

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

43)  $f(x) = 9x + 9$ ;  $g(x) = 8x - 5$

Find  $f \cdot g$ .

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

44)  $f(x) = 9x + 2$ ;  $g(x) = 4x + 3$

Find  $f \cdot g$ .

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

45)  $f(x) = 3x + 2$ ;  $g(x) = 5x - 1$

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

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

46)  $f(x) = 2x + 1$ ;  $g(x) = 3x - 2$

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

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

47)  $f(x) = x + 9$ ;  $g(x) = 3x^2$

Find  $f + g$ .

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

48)  $f(x) = x + 1$ ;  $g(x) = 4x^2$

Find  $f - g$ .

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

Find the composite function for the given functions and state the domain.

49)  $g \circ f$  for  $f(x) = \frac{8}{x}$  and  $g(x) = 9x^6$

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

50)  $g \circ f$  for  $f(x) = x^5 + 8$  and  $g(x) = \sqrt[5]{x - 8}$

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

51)  $f \circ g \circ h$  for  $f(x) = \sqrt{x}$ ,  $g(x) = \frac{x}{2}$ , and  $h(x) = 2x + 8$

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

52)  $f \circ g \circ h$  for  $f(x) = \sqrt{x}$ ,  $g(x) = \frac{x}{5}$ , and  $h(x) = 5x + 20$

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

53)  $h \circ g \circ f$  for  $f(x) = \sqrt{x}$ ,  $g(x) = \frac{x}{2}$ , and  $h(x) = 2x + 6$

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

54)  $h \circ g \circ f$  for  $f(x) = \sqrt{x}$ ,  $g(x) = \frac{x}{3}$ , and  $h(x) = 3x + 6$

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

Find the domain of the composite function  $f \circ g$ .

55)  $f(x) = 9x + 63$ ,  $g(x) = x + 6$

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

56)  $f(x) = 4x + 36$ ,  $g(x) = x + 1$

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

$$57) f(x) = \frac{3}{x+8}, \quad g(x) = \frac{8}{x}$$

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

$$58) f(x) = \frac{3}{x+10}, \quad g(x) = \frac{60}{x}$$

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

$$59) f(x) = 4x + 20; \quad g(x) = \sqrt{x}$$

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

$$60) f(x) = 4x + 12; \quad g(x) = \sqrt{x}$$

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

**Solve the problem.**

61) At Allied Electronics, production has begun on the X-15 Computer Chip. The total revenue function is given by  $R(x) = 58x - 0.3x^2$  and the total profit function is given by  $P(x) = -0.3x^2 + 48x - 10$ , where  $x$  represents the number of boxes of computer chips produced. The total cost function,  $C(x)$ , is such that  $C(x) = R(x) - P(x)$ . Find  $C(x)$ .

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

62) At Allied Electronics, production has begun on the X-15 Computer Chip. The total revenue function is given by  $R(x) = 54x - 0.3x^2$  and the total profit function is given by  $P(x) = -0.3x^2 + 51x - 14$ , where  $x$  represents the number of boxes of computer chips produced. The total cost function,  $C(x)$ , is such that  $C(x) = R(x) - P(x)$ . Find  $C(x)$ .

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

63) At Allied Electronics, production has begun on the X-15 Computer Chip. The total cost function is given by  $C(x) = 7x + 11$  and the total profit function is given by  $P(x) = -0.3x^2 + 33x - 11$ , where  $x$  represents the number of boxes of computer chips produced. The total revenue function,  $R(x)$ , is such that  $R(x) = C(x) + P(x)$ . Find  $R(x)$ .

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

64) At Allied Electronics, production has begun on the X-15 Computer Chip. The total cost function is given by  $C(x) = 12x + 16$  and the total profit function is given by  $P(x) = -0.3x^2 + 31x - 16$ , where  $x$  represents the number of boxes of computer chips produced. The total revenue function,  $R(x)$ , is such that  $R(x) = C(x) + P(x)$ . Find  $R(x)$ .

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

65) A stone is thrown into a pond. A circular ripple is spreading over the pond in such a way that the radius is increasing at the rate of 3.5 feet per second. Find a function,  $r(t)$ , for the radius in terms of  $t$ . Find a function,  $A(r)$ , for the area of the ripple in terms of  $r$ . Find  $(A \circ r)(t)$ .

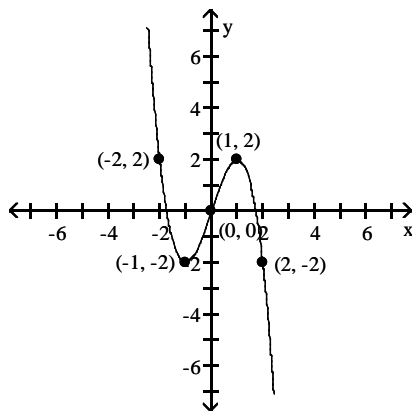
65) \_\_\_\_\_

66) A stone is thrown into a pond. A circular ripple is spreading over the pond in such a way that the radius is increasing at the rate of 5.1 feet per second. Find a function,  $r(t)$ , for the radius in terms of  $t$ . Find a function,  $A(r)$ , for the area of the ripple in terms of  $r$ . Find  $(A \circ r)(t)$ .

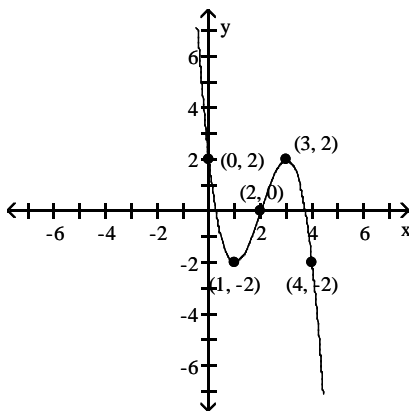
66) \_\_\_\_\_

Given the graph of the function  $f(x)$ , find a formula for  $g(x)$  in terms of  $f$ .

67)  $f(x)$

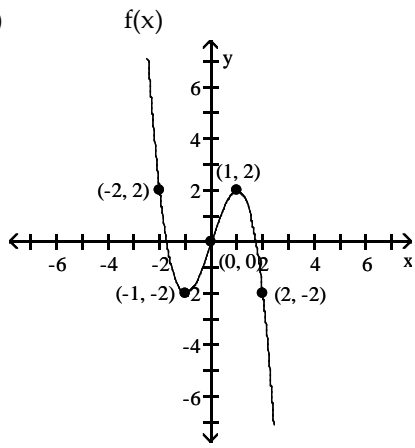


$g(x)$

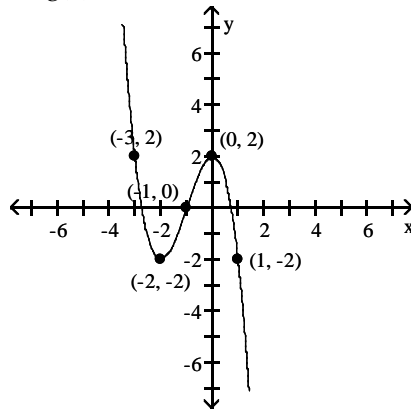


67) \_\_\_\_\_

68)

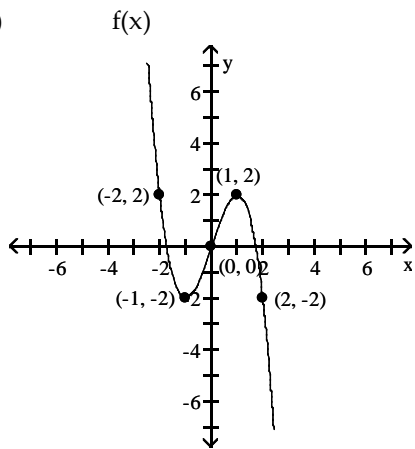


$g(x)$

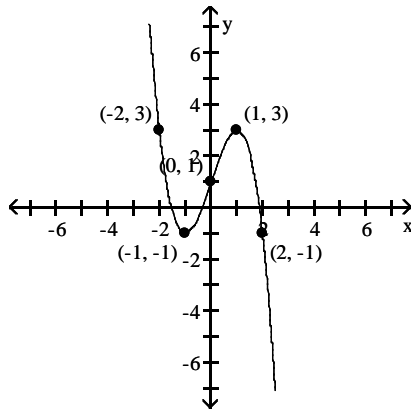


68) \_\_\_\_\_

69)

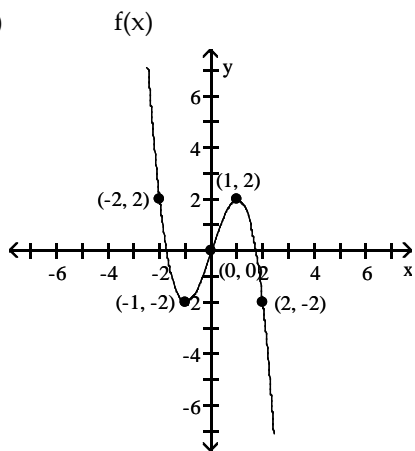


$g(x)$

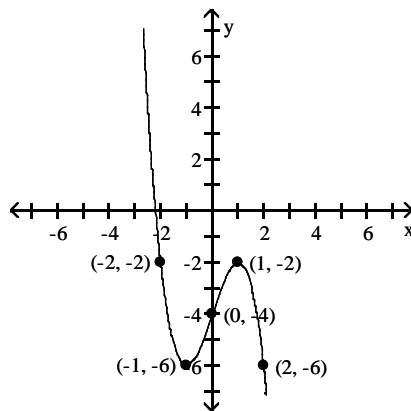


69) \_\_\_\_\_

70)



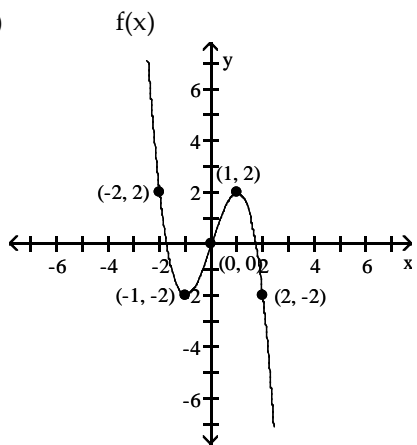
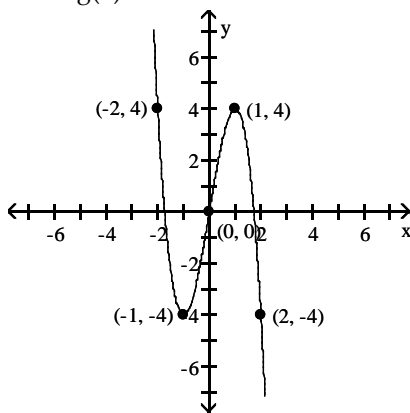
$g(x)$



70) \_\_\_\_\_



71)

 $g(x)$ 

71) \_\_\_\_\_

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

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

72) \_\_\_\_\_

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

73) \_\_\_\_\_

74)  $f(x) = 5x^2 + x^4$

74) \_\_\_\_\_

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

75) \_\_\_\_\_

76)  $f(x) = x^5 - x^4$

76) \_\_\_\_\_

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

77) \_\_\_\_\_

78)  $f(x) = -3x^5 + x^3$

78) \_\_\_\_\_

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

79) \_\_\_\_\_

80)  $f(x) = x^3 + x^2 + 3$

80) \_\_\_\_\_

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

81) \_\_\_\_\_

Simplify the difference quotient  $\frac{f(x+h) - f(x)}{h}$  and  $\frac{f(x) - f(a)}{x - a}$  for the following function.

82)  $f(x) = 6x + 5$

82) \_\_\_\_\_

83)  $f(x) = 2x + 5$

83) \_\_\_\_\_

84)  $f(x) = 9x + 5$

84) \_\_\_\_\_

85)  $f(x) = 4x^2 + 5x + 2$

85) \_\_\_\_\_

86)  $f(x) = 4x^2 + 3x - 5$

86) \_\_\_\_\_

87)  $f(x) = 4x^2 + 3x + 1$

87) \_\_\_\_\_

**Write an equation that expresses the relationship. Use k as the constant of variation.**

88) d varies inversely as z.

88) \_\_\_\_\_

89) r varies inversely as y.

89) \_\_\_\_\_

**Determine the constant of variation for the stated condition.**

90) s varies inversely as r, and  $s = 8$  when  $r = 9$ .

90) \_\_\_\_\_

91) s varies inversely as r, and  $s = 4$  when  $r = 12$ .

91) \_\_\_\_\_

**Use the four-step procedure to solve the variation problem.**

92) x varies inversely as v.  $x = 12$  when  $v = 9$ . Find x when  $v = 36$ .

92) \_\_\_\_\_

93) x varies inversely as v.  $x = 6$  when  $v = 9$ . Find x when  $v = 27$ .

93) \_\_\_\_\_

94) When the temperature stays the same, the volume of a gas varies inversely as the pressure of the gas. If a balloon is filled with 80 cubic inches of a gas at a pressure of 14 pounds per square inch, find the new pressure of the gas if the volume is decreased to 16 cubic inches.

94) \_\_\_\_\_

- 95) When the temperature stays the same, the volume of a gas varies inversely as the pressure of the gas. If a balloon is filled with 164 cubic inches of a gas at a pressure of 14 pounds per square inch, find the new pressure of the gas if the volume is decreased to 41 cubic inches. 95) \_\_\_\_\_
- 96) The amount of time it takes a swimmer to swim a race varies inversely as the average speed of the swimmer. A swimmer finishes a race in 60 seconds with an average speed of 5 feet per second. Find the average speed of the swimmer if it takes 100 seconds to finish the race. 96) \_\_\_\_\_
- 97) The amount of time it takes a swimmer to swim a race varies inversely as the average speed of the swimmer. A swimmer finishes a race in 500 seconds with an average speed of 3 feet per second. Find the average speed of the swimmer if it takes 375 seconds to finish the race. 97) \_\_\_\_\_
- 98) If the force acting on an object stays the same, then the acceleration of the object varies inversely as its mass. If an object with a mass of 8 kilograms accelerates at a rate of 5 meters per second per second by a force, find the rate of acceleration of an object with a mass of 4 kilograms that is pulled by the same force. 98) \_\_\_\_\_
- 99) If the force acting on an object stays the same, then the acceleration of the object varies inversely as its mass. If an object with a mass of 16 kilograms accelerates at a rate of 10 meters per second per second by a force, find the rate of acceleration of an object with a mass of 4 kilograms that is pulled by the same force. 99) \_\_\_\_\_
- 100) If the voltage in an electric circuit is held constant, the current varies inversely as the resistance. If the current is 300 milliamperes when the resistance is 3 ohms, find the current when the resistance is 18 ohms. 100) \_\_\_\_\_
- 101) If the voltage in an electric circuit is held constant, the current varies inversely as the resistance. If the current is 80 milliamperes when the resistance is 3 ohms, find the current when the resistance is 12 ohms. 101) \_\_\_\_\_

102) While traveling at a constant speed in a car, the centrifugal acceleration passengers feel while the car is turning varies inversely as the radius of the turn. If the passengers feel an acceleration of 10 feet per second per second when the radius of the turn is 70 feet, find the acceleration the passengers feel when the radius of the turn is 140 feet. 102) \_\_\_\_\_

103) While traveling at a constant speed in a car, the centrifugal acceleration passengers feel while the car is turning varies inversely as the radius of the turn. If the passengers feel an acceleration of 16 feet per second per second when the radius of the turn is 80 feet, find the acceleration the passengers feel when the radius of the turn is 320 feet. 103) \_\_\_\_\_

# Answer Key

Testname: E2PREP1.1TO1.8V02

1)  $\frac{9}{11}$

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

3) undefined

4) undefined

5) 0

6) 0

7)  $\left(\frac{17}{2}, -\frac{7}{2}\right)$

8)  $\left(\frac{13}{2}, \frac{11}{2}\right)$

9)  $\left(-\frac{1}{2}, \frac{1}{2}\right)$

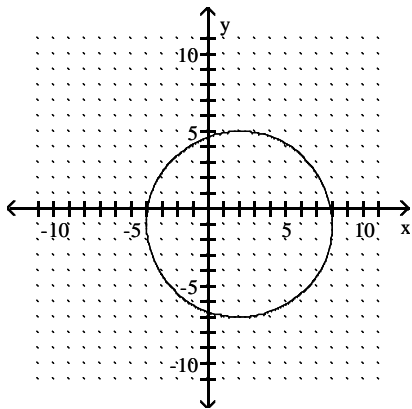
10)  $\left(-\frac{3}{10}, \frac{3}{10}\right)$

11)  $\left(\frac{3}{4}, \frac{3}{4}\right)$

12)  $\left(\frac{-13\sqrt{2}}{2}, \frac{17\sqrt{2}}{2}\right)$

13)  $\left(\frac{-11\sqrt{6}}{2}, \frac{11\sqrt{2}}{2}\right)$

14)  $(x - 2)^2 + (y + 1)^2 = 36$   
center  $(2, -1)$ ,  $r = 6$

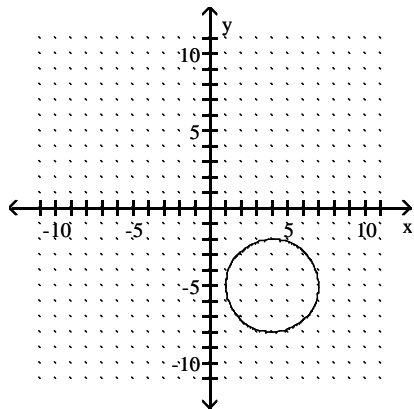


# Answer Key

Testname: E2PREP1.1TO1.8V02

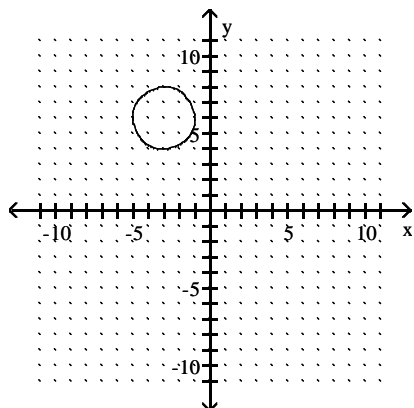
15)  $(x - 4)^2 + (y + 5)^2 = 9$

center  $(4, -5)$ ,  $r = 3$



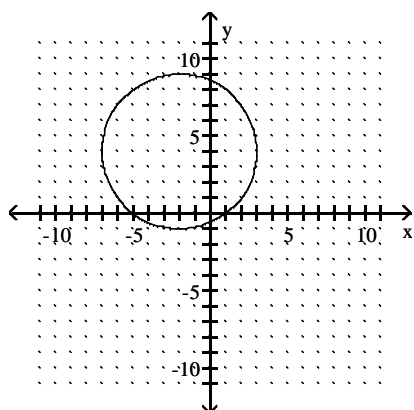
16)  $(x + 3)^2 + (y - 6)^2 = 4$

center  $(-3, 6)$ ,  $r = 2$



17)  $(x + 2)^2 + (y - 4)^2 = 25$

center  $(-2, 4)$ ,  $r = 5$

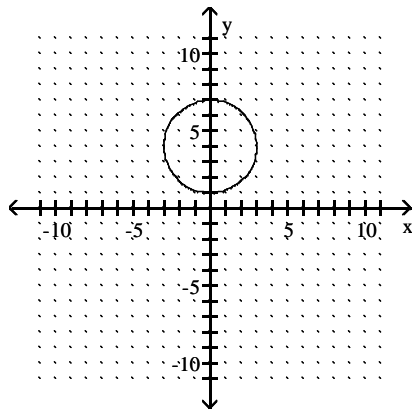


# Answer Key

Testname: E2PREP1.1TO1.8V02

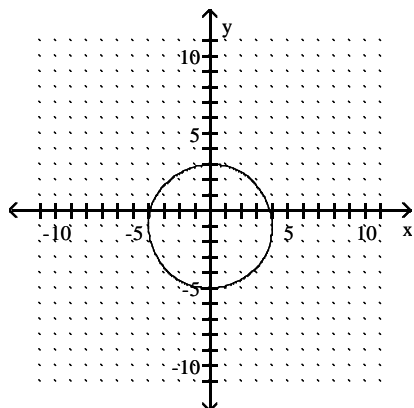
18)  $x^2 + (y - 4)^2 = 9$

center  $(0, 4)$ ,  $r = 3$



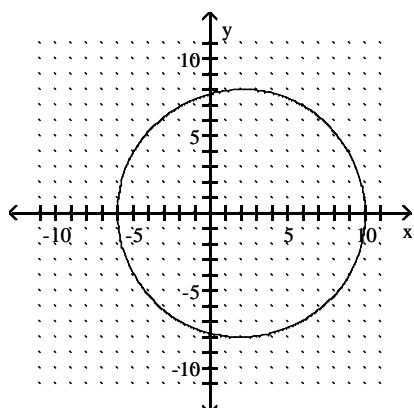
19)  $x^2 + (y + 1)^2 = 16$

center  $(0, -1)$ ,  $r = 4$



20)  $(x - 2)^2 + y^2 = 64$

center  $(2, 0)$ ,  $r = 8$

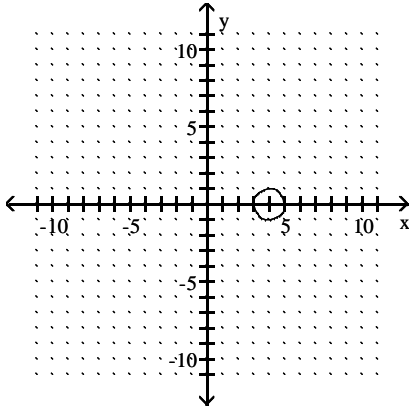




Answer Key

Testname: E2PREP1.1TO1.8V02

21)  $(x - 4)^2 + y^2 = 1$   
center  $(4, 0)$ ,  $r = 1$



22) Function

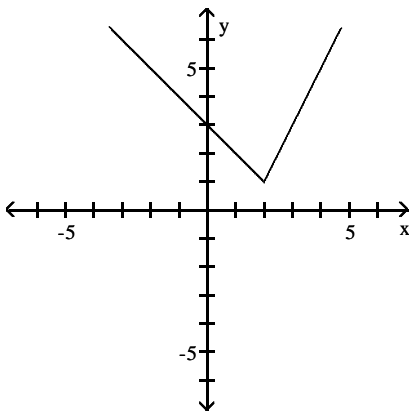
23) Not a function

24) Function

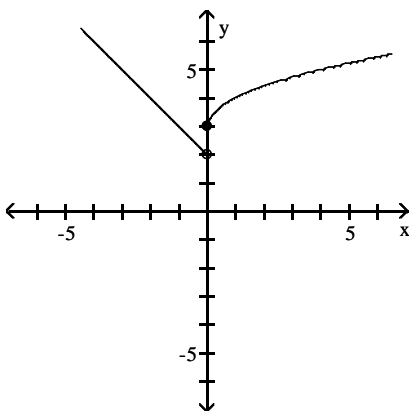
25) Not a function

26) Not a function

27)



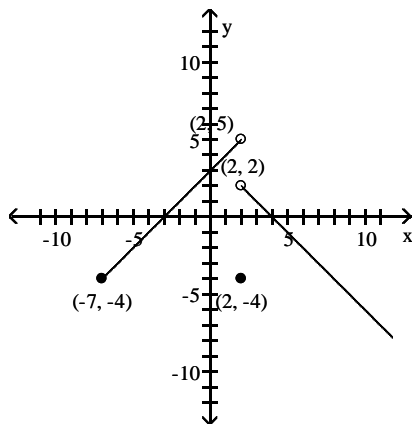
28)



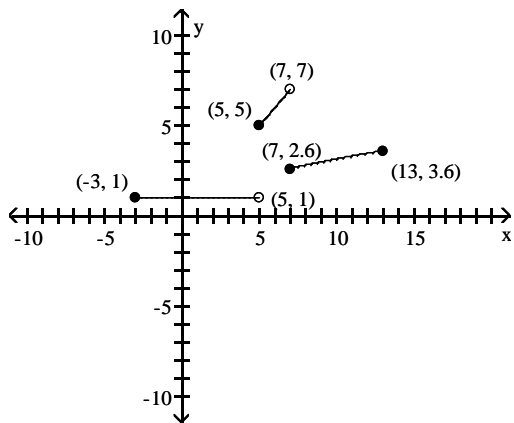
Answer Key

Testname: E2PREP1.1TO1.8V02

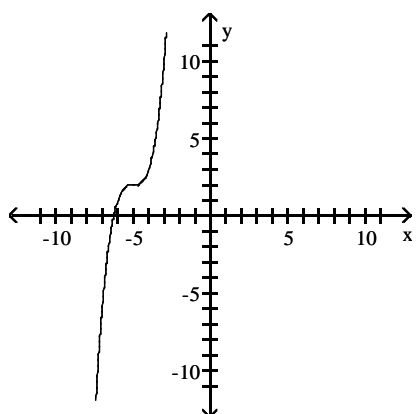
29)



30)



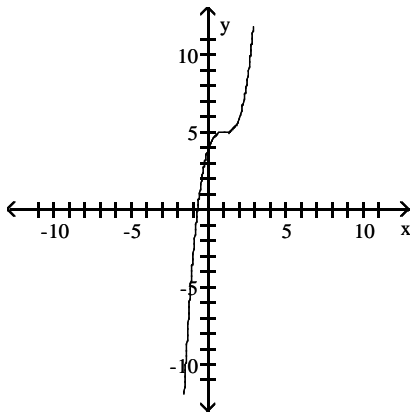
31)



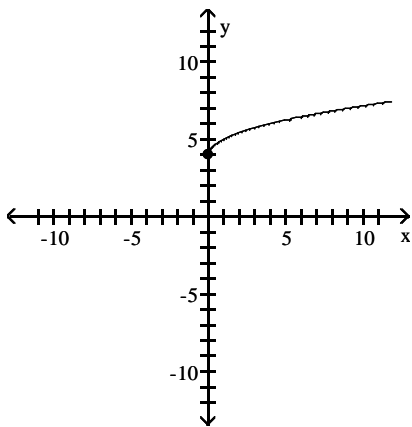
Answer Key

Testname: E2PREP1.1TO1.8V02

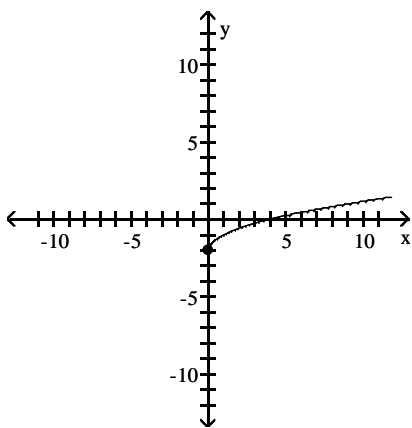
32)



33)



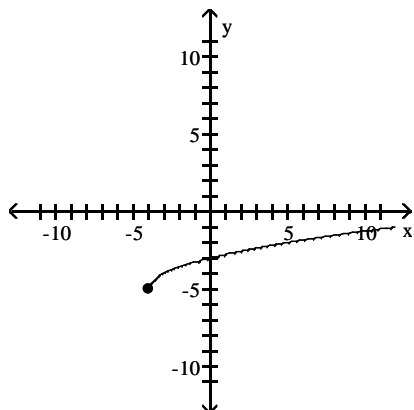
34)



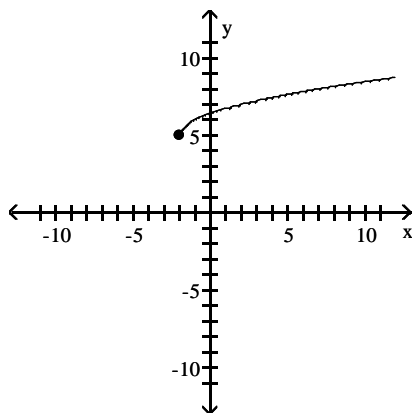
Answer Key

Testname: E2PREP1.1TO1.8V02

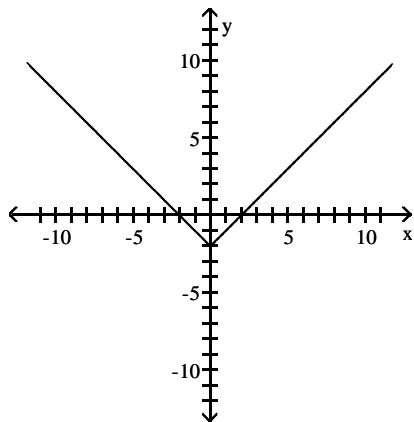
35)



36)



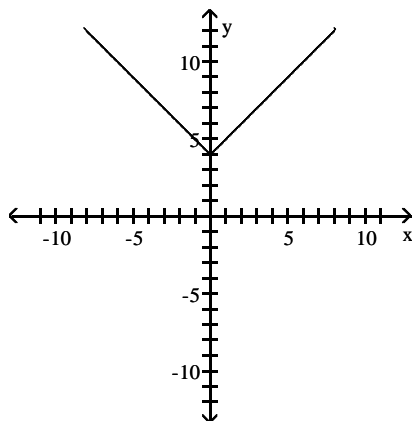
37)



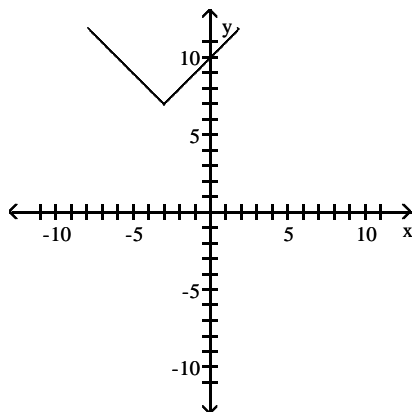
Answer Key

Testname: E2PREP1.1TO1.8V02

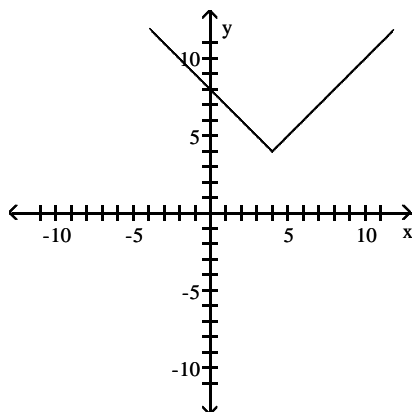
38)



39)



40)



41)  $(f - g)(x) = -2x + 1; (-\infty, \infty)$

42)  $(f - g)(x) = -2x - 2; (-\infty, \infty)$

43)  $(f \cdot g)(x) = 72x^2 + 27x - 45; (-\infty, \infty)$

44)  $(f \cdot g)(x) = 36x^2 + 35x + 6; (-\infty, \infty)$

45)  $\left(\frac{f}{g}\right)(x) = \frac{3x+2}{5x-1}; \left(-\infty, \frac{1}{5}\right) \text{ or } \left(\frac{1}{5}, \infty\right)$

46)  $\left(\frac{f}{g}\right)(x) = \frac{2x+1}{3x-2}; \left(-\infty, \frac{2}{3}\right) \text{ or } \left(\frac{2}{3}, \infty\right)$

47)  $(f + g)(x) = 3x^2 + x + 9; (-\infty, \infty)$

48)  $(f - g)(x) = -4x^2 + x + 1; (-\infty, \infty)$

# Answer Key

Testname: E2PREP1.1TO1.8V02

49)  $\frac{2,359,296}{x^6}$

50)  $x$

51)  $\sqrt{x+4}$

52)  $\sqrt{x+4}$

53)  $\sqrt{x}+6$

54)  $\sqrt{x}+6$

55)  $(-\infty, \infty)$

56)  $(-\infty, \infty)$

57)  $(-\infty, -1)$  or  $(-1, 0)$  or  $(0, \infty)$

58)  $(-\infty, -6)$  or  $(-6, 0)$  or  $(0, \infty)$

59)  $[0, \infty)$

60)  $[0, \infty)$

61)  $C(x) = 10x + 10$

62)  $C(x) = 3x + 14$

63)  $R(x) = 40x - 0.3x^2$

64)  $R(x) = 43x - 0.3x^2$

65)  $(A \circ r)(t) = 12.25\pi t^2$

66)  $(A \circ r)(t) = 26.01\pi t^2$

67)  $g(x) = f(x - 2)$

68)  $g(x) = f(x + 1)$

69)  $g(x) = f(x) + 1$

70)  $g(x) = f(x) - 4$

71)  $g(x) = 2f(x)$

72) Odd

73) Odd

74) Even

75) Even

76) Neither

77) Neither

78) Odd

79) Odd

80) Neither

81) Neither

82) 6

83) 2

84) 9

85)  $8x + 4h + 5$

86)  $8x + 4h + 3$

87)  $8x + 4h + 3$

88)  $d = \frac{k}{z}$

89)  $r = \frac{k}{y}$

90)  $k = 72$

91)  $k = 48$

92)  $x = 3$

93)  $x = 2$

## Answer Key

Testname: E2PREP1.1TO1.8V02

- 94) 70 pounds per square inch
- 95) 56 pounds per square inch
- 96) 3 feet per second
- 97) 4 feet per second
- 98) 10 meters per second per second
- 99) 40 meters per second per second
- 100) 50 milliamperes
- 101) 20 milliamperes
- 102) 5 feet per second per second
- 103) 4 feet per second per second