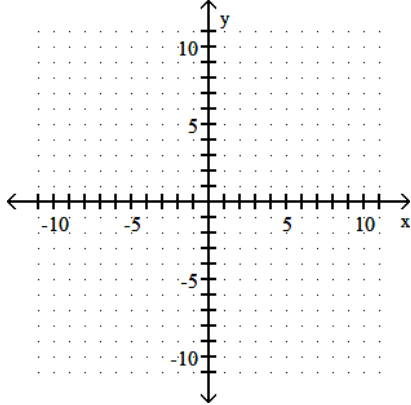Graph the linear equation by finding and plotting its intercepts.

1) 6x - 30y = 30

Find the slope of the line that passes through the given points.

2) (-8, 2) and (-3, 4)

Find the slope of the line.

3) 8x - 3y = 24

4) y = 3

5) x = -2

Determine whether the pair of lines is parallel, perpendicular, or neither.

6) y = -5x + 3
   y = 5x - 3

Find an equation of the line. Write the equation using function notation.

7) Through (-4, 13); perpendicular to 3x + 4y = 43

Find an equation of the line satisfying the given conditions. Write the equation using function notation.

8) Parallel to 2x - 5y = -5; through (10, 5)

Write an equation of the line with the given slope, m, and y-intercept (0, b).

9) $m = \dfrac{1}{2}$, b = 4

Find an equation of the line described. Write the equation in slope-intercept form if possible.

10) Through (4, 14) and (7, 20)

Complete the following:
(a) Write the equation in slope-intercept form.
(b) Give the slope and y-intercept of the line.

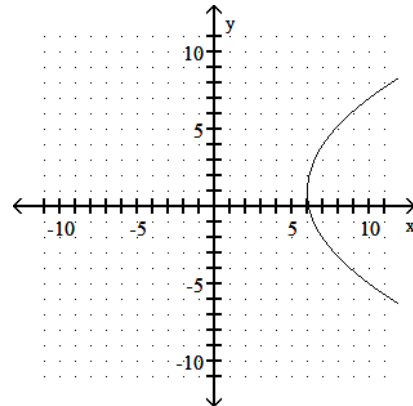11) 2x + 3y = 16

Find the domain and the range of the relation.

12) {(8, 1), (-10, 0), (-2, -2), (12, -10)}
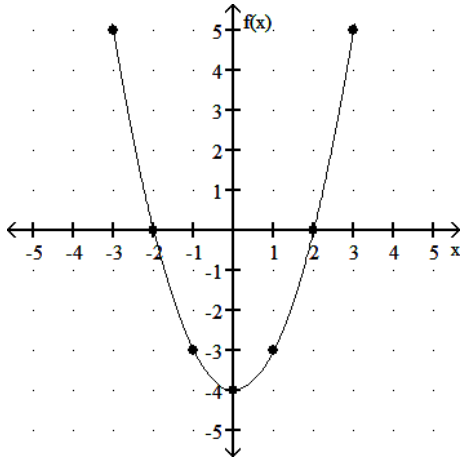
Determine whether the relation is also a function.

13) {(-7, -1), (-7, -5), (2, 9), (3, 1), (8, 6)}

Determine whether the graph is the graph of a function.

14)

Use the graph of the function to find the value.

15) Find f(-2)

Evaluate the function.
   16) Find f(-4) when f(x) = 5x^2 + 4x - 1.

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."
   17) 54x^{8}y^9 + 18x^{6}y^6 + 24x^{3}y^4

18) -8x^4 + 12x^3 - 4x^2

19) 18x^2 - 12xy - 15xy + 10y^2

20) x^2 - 5x - 24

21) x^2 - x - 40

22) x^4 - 4x^3 - 45x^2

23) 8y^2 - 18y + 9

24) x^2 + 8xy + 16y^2

25) 6x^2 + 17x + 12

26) 9x^2 - 4

Solve the equation.
   27) x^2 + 4x - 12 = 0

28) x(3x + 16) = 12

29) 13x^2 - 3x = 0

30) 25x^2 - 81 = 0

Find the domain of the rational expression.
   31) $f(x) = \dfrac{x^2 - 64}{x^2 + 11x + 30}$

Simplify the rational expression.
   32) $\dfrac{5 - x}{4x - 20}$

Find the product and simplify.
   33) $\dfrac{4p - 4}{7} \cdot \dfrac{9p^2}{p^2 - p}$

Find the quotient and simplify.
   34) $\dfrac{2z^2y}{5zy^2} \div \dfrac{10z^2y^2}{6zy}$

   35) $\dfrac{z^2 + 5z + 6}{z^2 + 10z + 16} \div \dfrac{z^2 + 3z}{z^2 + 14z + 48}$

Perform the indicated operation. Simplify if possible.
   36) $\dfrac{x^2 - 11x}{x - 5} + \dfrac{30}{x - 5}$

Find the least common denominator (LCD).
   37) $\dfrac{4}{12x}, \dfrac{8}{15x^2}$

   38) $\dfrac{9}{x^2 + 4x}, \dfrac{3}{x^2 + 9x + 20}$

Perform the indicated operation. Simplify if possible.
   39) $\dfrac{7}{x} + \dfrac{9}{x - 2}$

   40) $\dfrac{7}{x - 4} + \dfrac{16}{4 - x}$

   41) $\dfrac{x}{x^2 - 16} - \dfrac{3}{x^2 + 5x + 4}$

42) $\dfrac{2}{5x} + \dfrac{7}{10x}$

Solve the equation.

43) $\dfrac{7x}{5} + 4 = \dfrac{1}{4}$

44) $\dfrac{2}{t} = \dfrac{t}{5t - 12}$

45) $\dfrac{8}{y + 3} - \dfrac{2}{y - 3} = \dfrac{12}{y^2 - 9}$

Solve the equation for the indicated variable.

46) $V = \dfrac{Bh}{3}$ for h

47) $T = \dfrac{V}{Q}$ for Q

Solve the proportion.

48) $\dfrac{x + 6}{5} = \dfrac{x + 8}{7}$

Solve.

49) The ratio of a quarterback's completed passes to attempted passes is 2 to 9. If he attempted 45 passes, find how many passes he completed. Round to the nearest whole number if necessary.

50) A painter can finish painting a house in 4 hours. Her assistant takes 6 hours to finish the same job. How long would it take for them to complete the job if they were working together?

Simplify.

51)
$$\dfrac{4 + \dfrac{2}{x}}{\dfrac{x}{3} + \dfrac{1}{6}}$$

52)
$$\dfrac{1 - \dfrac{8}{x}}{x - \dfrac{64}{x}}$$

Find the square root. Assume that all variables represent positive real numbers.

53) $-\sqrt{81}$

54) $\sqrt{-576}$

Find the cube root.

55) $\sqrt[3]{-729}$

Use radical notation to write the expression. Simplify if possible.

56) $(49x^6)^{1/2}$

57) $(5x)^{3/7}$

58) $7x^{2/7}$

59) $\left(\dfrac{8}{27}\right)^{2/3}$

Write with positive exponents. Simplify if possible.

60) $243^{-4/5}$

61) $x^{-4/5}$

Use the properties of exponents to simplify the expression. Write with positive exponents.

62) $\dfrac{(-2x^{2/7})^3}{x^{1/5}}$

63) $\dfrac{x^{2/3} \cdot x^{1/2}}{x^{-1/7}}$

Use rational exponents to simplify the following.

64) $\sqrt[8]{y^{12}z^{14}}$

Simplify the radical expression. Assume that all variables represent positive real numbers.

65) $\sqrt{45k^7q^8}$

Find the distance between the pair of points.

66) $(2, -1)$ and $(6, -7)$

Add or subtract. Assume all variables represent positive real numbers.

67) $\sqrt{108} + 10\sqrt{75} - 6\sqrt{48}$

Multiply, and then simplify if possible. Assume all variables represent positive real numbers.

68) $(\sqrt{13} + 3)(\sqrt{13} - 3)$

69) $2\sqrt{7}(\sqrt{11} + \sqrt{7})$

Rationalize the denominator and simplify. Assume that all variables represent positive real numbers.

70) $\dfrac{\sqrt{5}}{\sqrt{11}}$

71) $\dfrac{3}{5 - \sqrt{6}}$

Solve.

72) $\sqrt{4x + 9} - 2 = 0$

73) $\sqrt[3]{3x + 1} + 4 = 0$

74) $\sqrt{43 - x} = x - 1$

Write in terms of i.

75) $\sqrt{-225}$

Perform the indicated operation. Write the result in the form $a + bi$.

76) $(5 + 8i) - (-8 + i)$

77) $(6 - 9i)^2$

78) $4i(8 - 6i)$

79) $\dfrac{2}{9 - 4i}$

Use the square root property to solve the equation.

80) $x^2 = 140$

81) $(2x - 3)^2 = 49$

82) $(x - 11)^2 = -4$

Add the proper constant to each binomial so that the resulting trinomial is a perfect square trinomial. Then factor the trinomial.

83) $x^2 + 14x +$ _____

Solve the equation by completing the square.

84) $x^2 + 16x + 53 = 0$

85) $9x^2 + 18x + 8 = 0$

Use the quadratic formula to solve the equation.

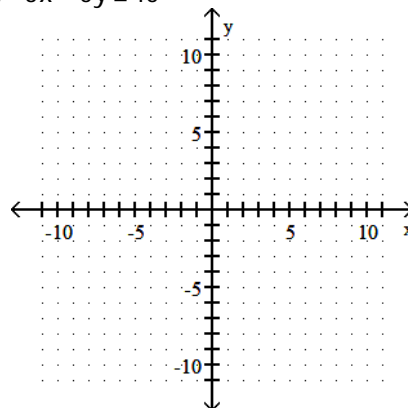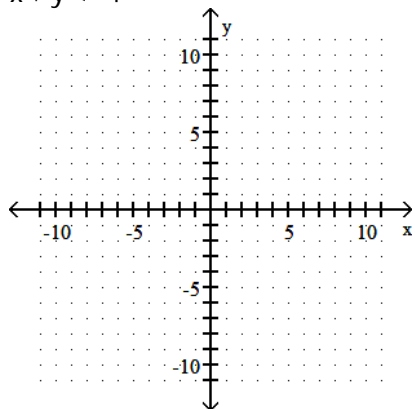86) $3x^2 = -6x - 1$

87) $7x^2 - 3x + 5 = 0$

88) $x^2 + 8x + 52 = 0$

Graph the linear inequality.

89) $-3x - 5y \le 15$
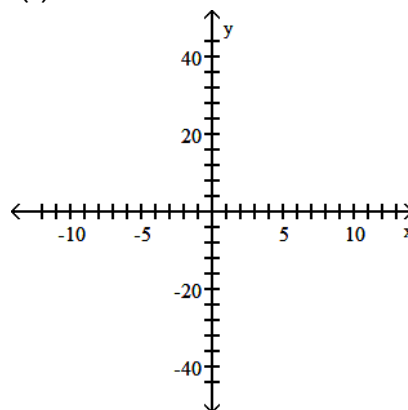
90) $x + y < -4$

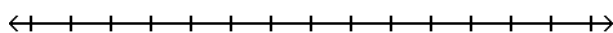Solve the compound inequality. Graph the solution set.

91) $-16 \leq -3z - 1 \leq -13$

92) $6x - 4 < 2x$ or $-2x \leq -6$

Solve the absolute value equation.

93) $|2x + 8| + 10 = 4$

94) $|5x - 9| = |x + 2|$

Solve the equation or inequality.

95) $|3k + 1| > -9$

96) $|x + 5| - 4 \leq 2$

Using transformations, sketch the graph of the requested function.

97) The graph of a function f is illustrated. Use the graph of f as the first step toward graphing the function $F(x)$, where $F(x) = f(x + 2) - 1$.

Complete the square and then use the shifting technique to graph the function.

98) $f(x) = x^2 + 8x$

Graph the function.

99) $f(x) = (x + 1)^2 + 4$
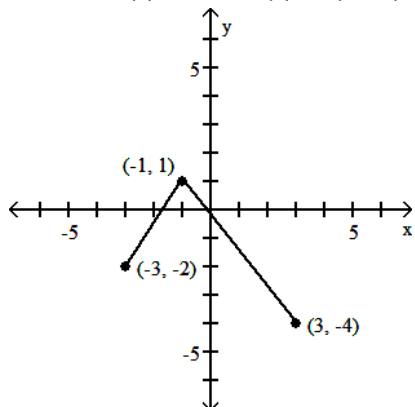
Suppose the point (2, 4) is on the graph of $y = f(x)$. Find a point on the graph of the given function.

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

Write a general formula to describe the variation.

101) v varies directly with t; $v = 13$ when $t = 17$

Solve the problem.

102) x varies inversely as v, and $x = 45$ when $v = 6$. Find x when $v = 54$.