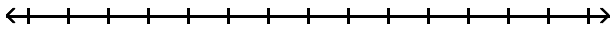Name_____

State the solution set of the inequality in interval notation and sketch its graph.

  1) $7x + 2 > 6x - 4$
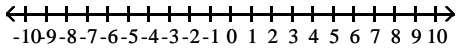
  1) _____

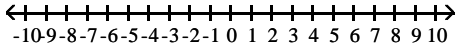**Express the interval in set–builder notation and graph the interval on a number line.**
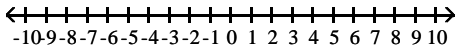
  2) (–1, 1]

  2) _____

  3) (–5, 4]

  3) _____

  4) [–6, 9)
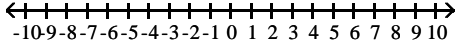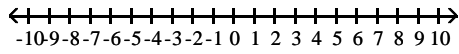
  4) _____

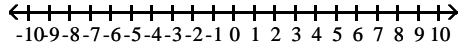
  5) [–2, 5)

  5) _____

6) $\left(-\infty, \dfrac{9}{2}\right]$

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 -10-9-8-7-6-5-4-3-2-1 0  1  2  3  4  5  6  7  8  9 10
```
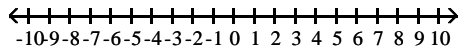
6) _____

7) $\left(-\infty, \dfrac{6}{5}\right]$

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 -10-9-8-7-6-5-4-3-2-1 0  1  2  3  4  5  6  7  8  9 10
```

7) _____

8) $[-1, 7]$

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 -10-9-8-7-6-5-4-3-2-1 0  1  2  3  4  5  6  7  8  9 10
```

8) _____

9) $[-2, 4]$

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 -10-9-8-7-6-5-4-3-2-1 0  1  2  3  4  5  6  7  8  9 10
```

9) _____

10) $(-6, \infty)$

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 -10-9-8-7-6-5-4-3-2-1 0  1  2  3  4  5  6  7  8  9 10
```

10) _____

11) $(-4, \infty)$

```
<-+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+->
 -10-9-8-7-6-5-4-3-2-1 0  1  2  3  4  5  6  7  8  9 10
```
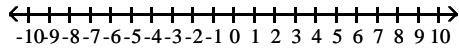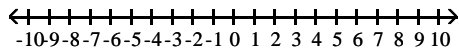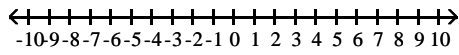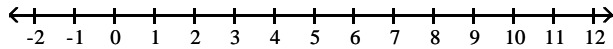
11) _____

Solve the compound inequality. Other than $\emptyset$, use interval notation to express the solution set and graph the solution set on a number line.
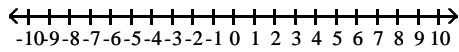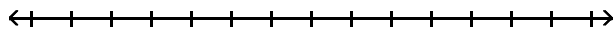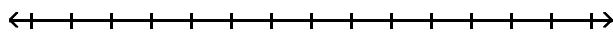
12) $15 < 5x \le 30$

-2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12

12) _____

13) $-2 < x - 1 \le 4$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

13) _____

14) $17 \le 5x - 3 \le 27$

14) _____

15) $-13 \le -2x - 1 < -9$

15) _____

16) $-16 \le -2x - 4 \le -8$

16) _____
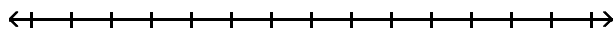
17) $-4 \le -4x - 12 < 4$

-10   -5   0   5   10
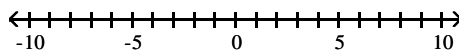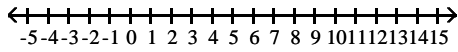
17) _____

18) $1 \leq \dfrac{5}{2}x - 4 < 11$

-5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Express the interval in set–builder notation and graph the interval on a number line.

19) $[2, \infty)$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

19) _____

20) $[-8, \infty)$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

20) _____

21) $(-\infty, 2.5]$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

21) _____

22) $(-\infty, 2.5]$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
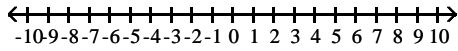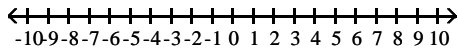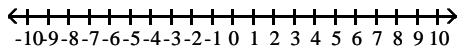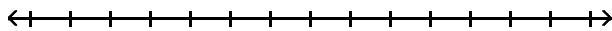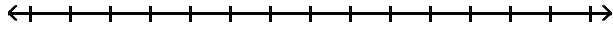
22) _____
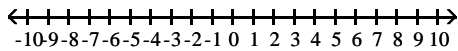
State the solution set of the inequality in interval notation and sketch its graph.

23) $3x + 4 > 2x + 2$

23) _____

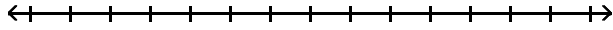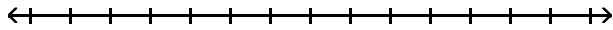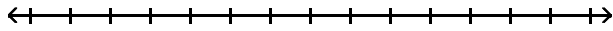24) $8x + 5 \geq 7x - 2$

25) $4x - 7 \geq 3x - 9$

26) $12x + 16 > 4(2x + 1)$
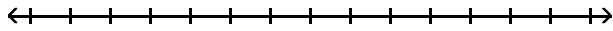
27) $14x - 8 > 2(6x + 1)$

28) $-42x - 42 \leq -6(6x + 8)$
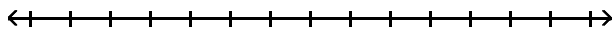
29) $-24x - 12 \leq -6(3x + 6)$
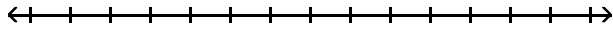
30) $3x - 2 \geq 2x - 9$

Solve.

31) Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual interest, and the remainder in a mutual fund that paid 11% annual interest. If his total interest for that year was $800, how much did Kevin invest in the mutual fund?

31) _____

32) Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual interest, and the remainder in a mutual fund that paid 11% annual interest. If his total interest for that year was $700, how much did Kevin invest in the mutual fund?

32) _____

33) Melissa invested a sum of money at 3% annual interest. She invested three times that sum at 5% annual interest. If her total yearly interest from both investments was $3600, how much was invested at 3%?

33) _____

34) A bank loaned out $57,000, part of it at the rate of 11% per year and the rest at a rate of 8% per year. If the interest received was $5310, how much was loaned at 11%?

34) _____

35) A bank loaned out $69,000, part of it at the rate of 15% per year and the rest at a rate of 4% per year. If the interest received was $5730, how much was loaned at 15%?

35) _____

Solve the problem.

36) Jamil always throws loose change into a pencil holder on his desk and takes it out every two weeks. This time it is all nickels and dimes. There are 8 times as many dimes as nickels, and the value of the dimes is $3.75 more than the value of the nickels. How many nickels and dimes does Jamil have?

36) _____

37) Jamil always throws loose change into a pencil holder on his desk and takes it out every two weeks. This time it is all nickels and dimes. There are 7 times as many dimes as nickels, and the value of the dimes is $3.90 more than the value of the nickels. How many nickels and dimes does Jamil have?

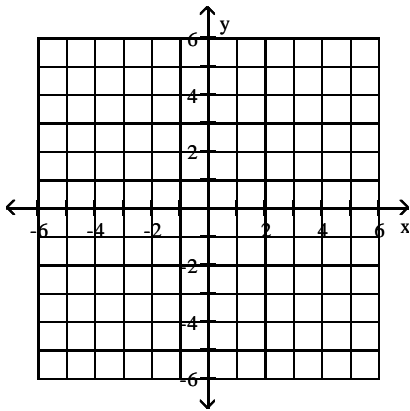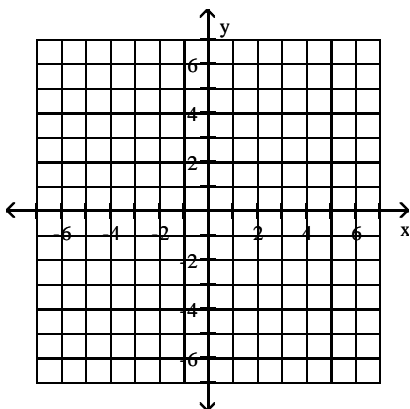37) _____

Graph the equation.
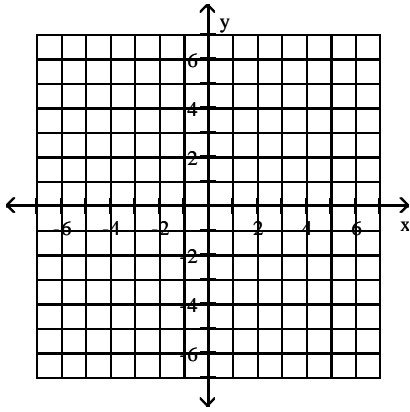
38) y = x – 1

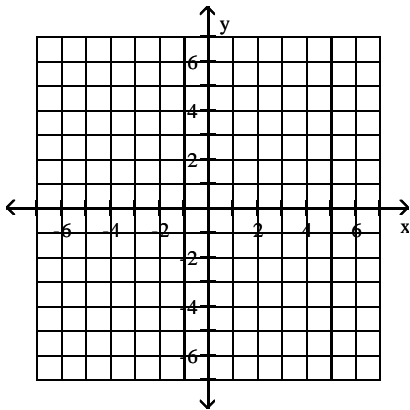38) _____
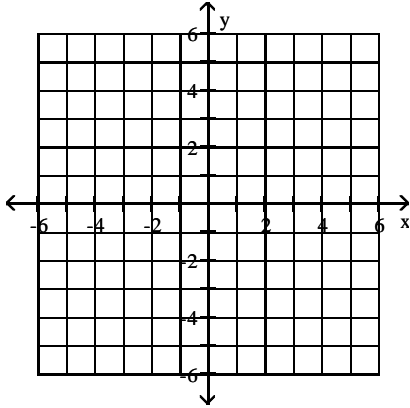
39) y = x – 3

39) _____

40) y = 3x – 2

40) _____

41) $y = 3x + 2$

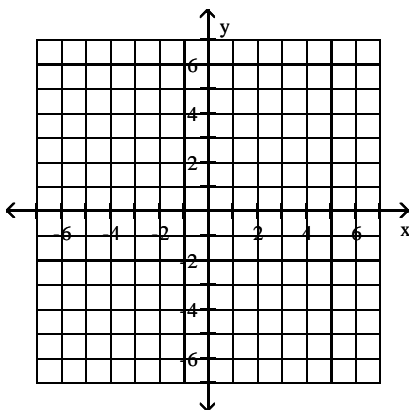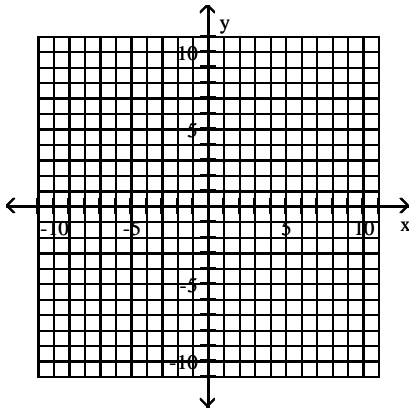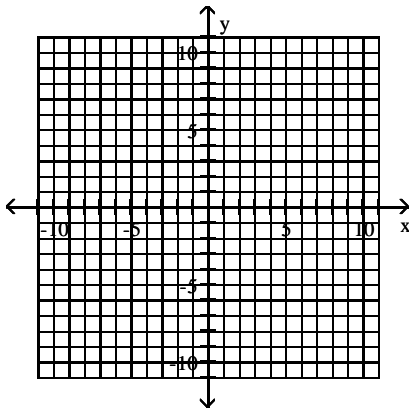42) $y = -\dfrac{1}{5}x + 4$

43) $y = -\dfrac{1}{2}x - 4$

44) $y = x^2 + 5$
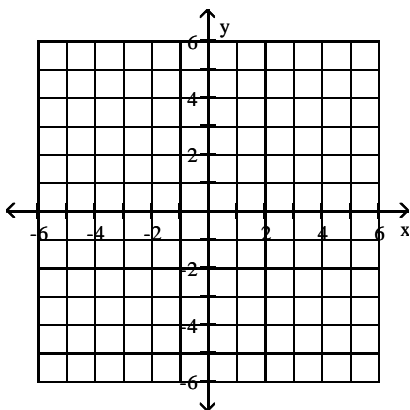
44) _____

45) $y = x^2 - 5$

45) _____

46) $y = x^3 + 2$
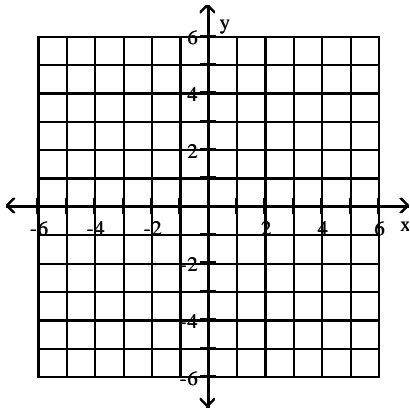
46) _____

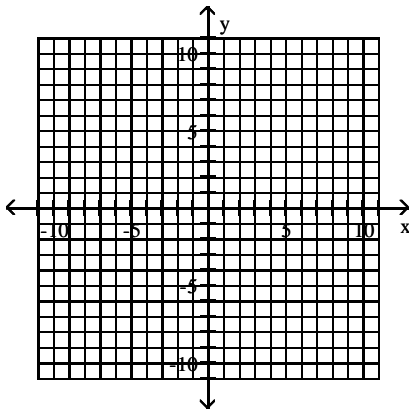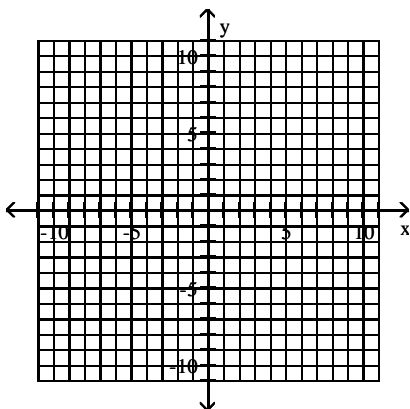47) $y = x^3 + 5$ 47) _____

48) $y = -|x| + 2$ 48) _____
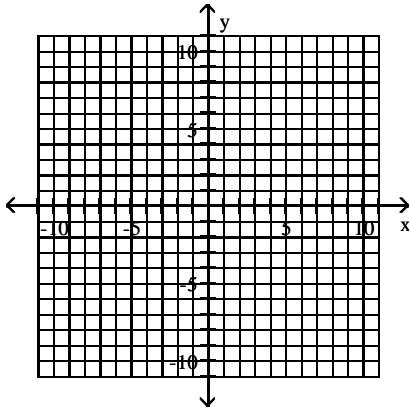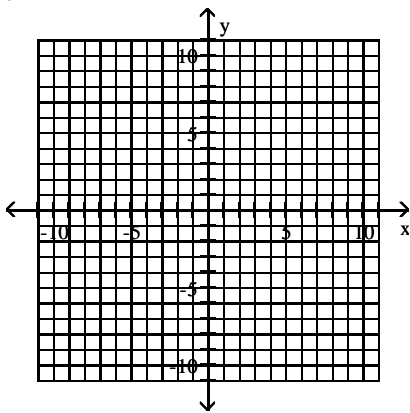
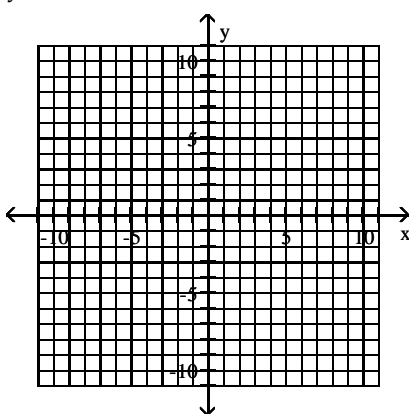49) $y = -|x| + 1$ 49) _____
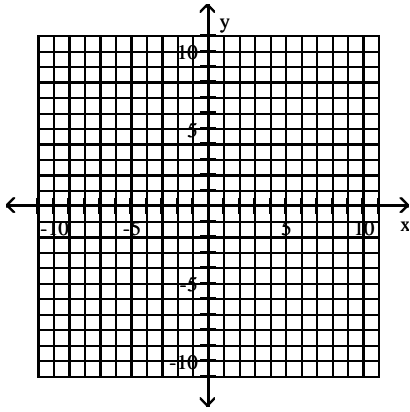
50) $y = -3|x|$

50) _____

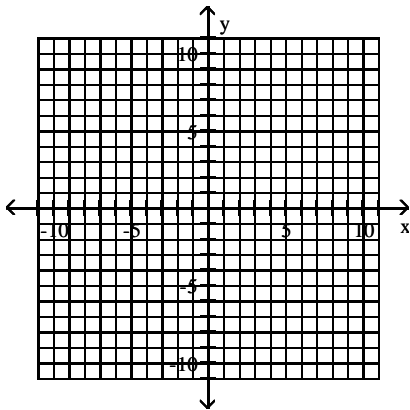51) $y = -5|x|$
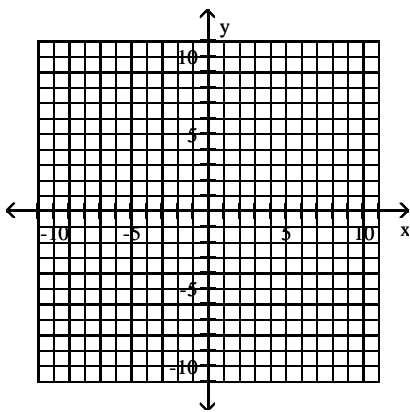
51) _____

52) $y = 3$

52) _____

53) y = 2

53) _____

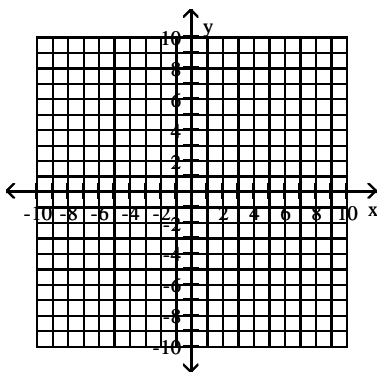54) $y = \dfrac{1}{x}$

54) _____

55) $y = \dfrac{1}{x}$

55) _____

Begin by graphing the standard absolute value function f(x) = |x|. Then use transformations of this graph to graph the given function.
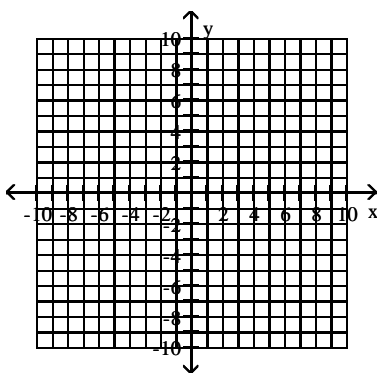
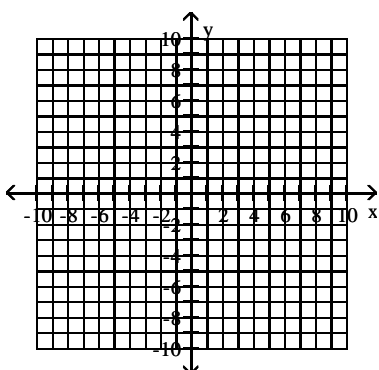56) $g(x) = |x| + 2$

56) _____

57) $g(x) = |x| + 3$

57) _____

Begin by graphing the standard function f(x) = x^3 Then use transformations of this graph to graph the given function.
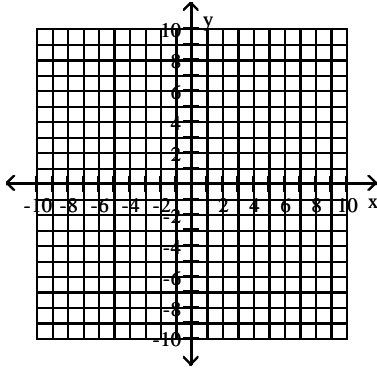
58) $g(x) = x^3 + 3$

58) _____

59) $g(x) = x^3 - 3$

59) _____

Determine the domain and range of the relation. State whether the relation is a function or not a function.

60)

input	2	6	2	2
output	14	1	5	7

60) _____

61)

input	2	5	2	8
output	7	3	5	4

61) _____

62)

input	-2	-1	1	2
output	2	5	2	5

62) _____

63)

input	-9	-3	3	9
output	6	12	6	12

63) _____

Solve the problem.

64) Some values for a relation are given in the table. Is the relation a function?

64) _____

x	y
1	5
2	9
3	2
3	4
4	7

65) Some values for a relation are given in the table. Is the relation a function?

65) _____

x	y
5	3
6	4
7	6
8	6
9	15

Solve the system . If there is no solution or an infinite number of solutions, so state. Use set notation to express the solution set.

66) $\begin{cases} x + y = -5 \\ x - y = 9 \end{cases}$

66) _____

67) $\begin{cases} x + y = 16 \\ x - y = 2 \end{cases}$

67) _____

68) $\begin{cases} x - 7y = -55 \\ 2x - 7y = -47 \end{cases}$

68) _____

69) $\begin{cases} x + 2y = 0 \\ 2x + 2y = 2 \end{cases}$

69) _____

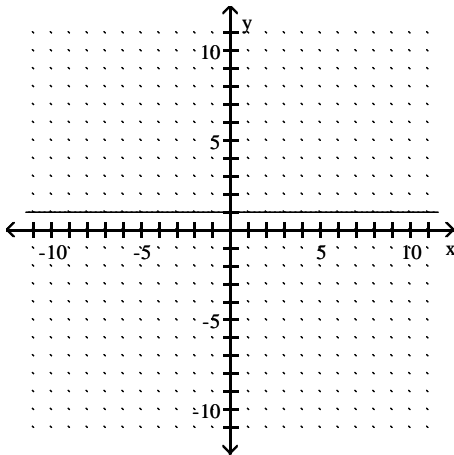**Find the domain and the range of the relation.**

70)

71)

72)

73)

74)

75)

76)
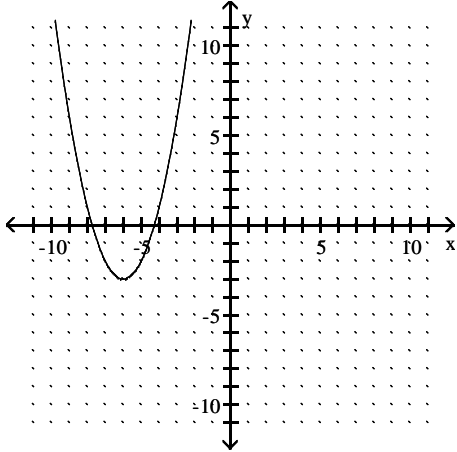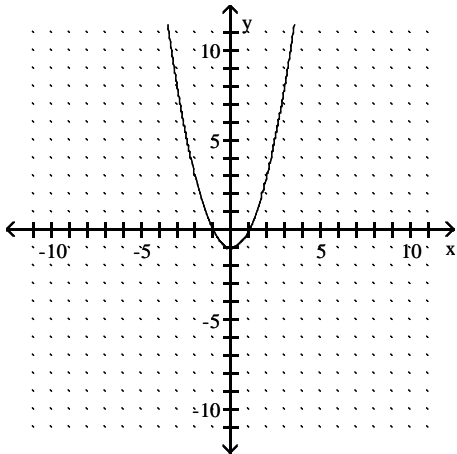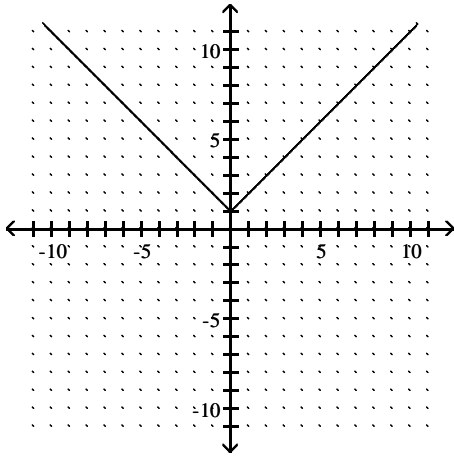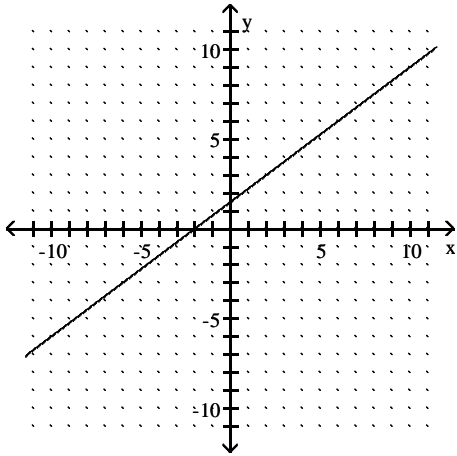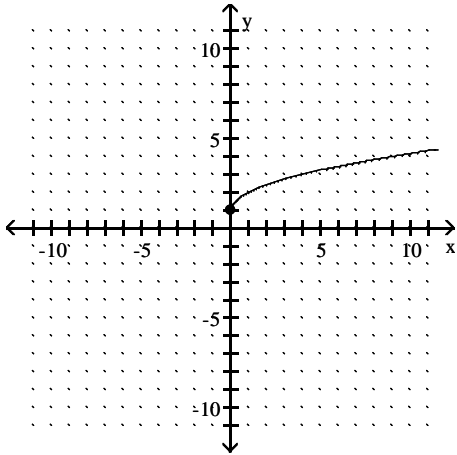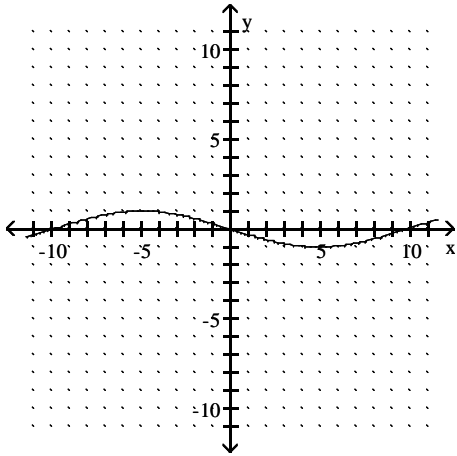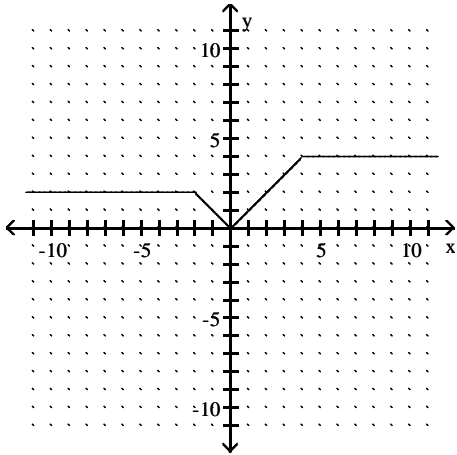
77)

Find the domain of the function.

78) $\dfrac{x}{\sqrt{x-6}}$

79) $\dfrac{x}{\sqrt{x-8}}$

80) $f(x) = \dfrac{1}{x - 8}$

80) _____

81) $f(x) = \dfrac{1}{x + 2}$

81) _____

82) $f(x) = \dfrac{-3x}{x + 5}$

82) _____

83) $f(x) = \dfrac{-8x}{x + 3}$

83) _____

84) $f(x) = x - \dfrac{6}{x + 3}$

84) _____

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

85) _____

86) $f(x) = \dfrac{1}{x - 8} + \dfrac{4}{x - 4}$

86) _____

87) $f(x) = \dfrac{1}{x - 5} + \dfrac{4}{x - 3}$

87) _____

Decide whether the relation is a function.

88) {(−1, −1), (1, −6), (6, −7), (9, 8), (12, −7)}

88) _____

89) {(−4, −2), (−3, 9), (4, 8), (4, −1)}

89) _____

90) {(−5, −7), (−3, 3), (1, −5), (5, 1)}

90) _____

Evaluate the function at the given value.

91) $f(x) = -6x + 4$; $f(-3)$

91) _____

92) $f(x) = -5x - 3$; $f(-2)$

92) _____

93) $f(x) = 9x - 17$; $f(0)$

93) _____

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

94) _____

95) $h(x) = |x - 8|$; $h(11)$

95) _____

96) $h(x) = -3$; $h(8)$

96) _____

Use the graph to find the indicated function value.

97) y = f(x). Find f(1)

98) y = f(x). Find f(5).
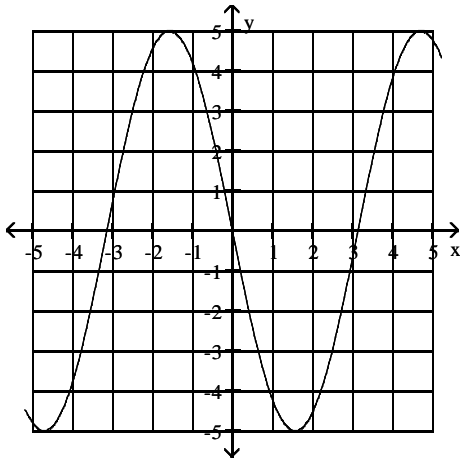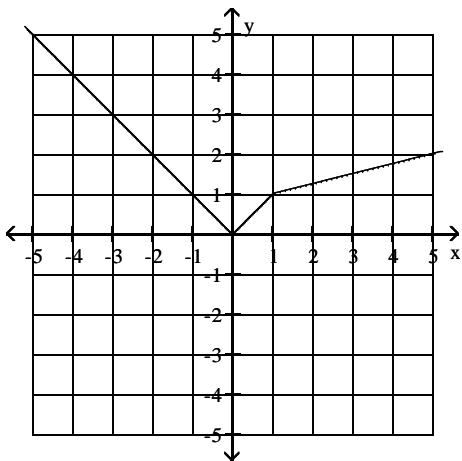
99) y = f(x). Find f(-5)

99) _____
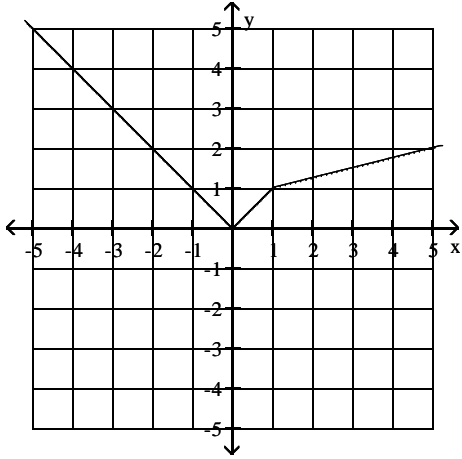
100) y = f(x). Find f(4)

100) _____
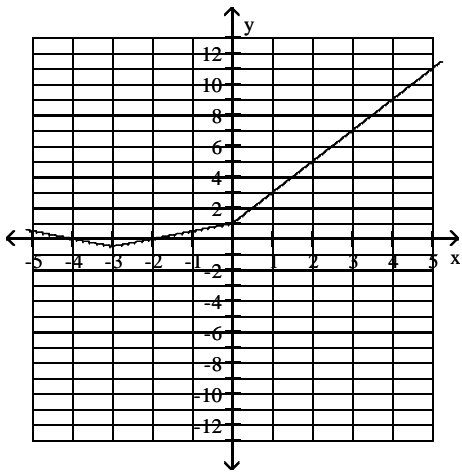
101) y = f(x). Find f(–4)

101) _____
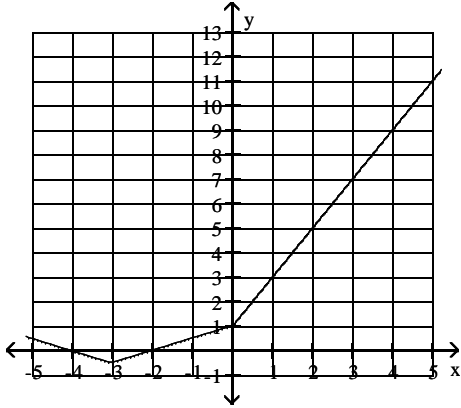
Evaluate the function at the given value.

102) g(x) = –11x; g(–2)

102) _____

103) f(x) = x^2 + 3x; f(–8)

103) _____

104) f(t) = $\sqrt{t + 133}$ + 2; f(11)

104) _____

105) f(r) = $\dfrac{5r}{|5r|}$; f(–11)

105) _____

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

106) (–1, 19) and (9, –4)

106) _____

107) (16, –4) and (4, 15)

107) _____

108) (4, –5), (–4, –8)

108) _____

109) (–7, –8), (9, 1)

109) _____

110) (1, –6) and (1, 2)

110) _____

111) (4, –8) and (4, –1)

111) _____

Find the slope of the line, or state that the slope is undefined.
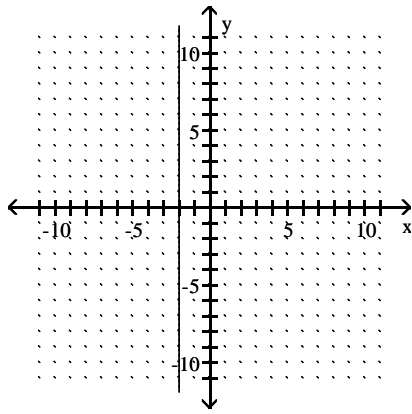112)

112) _____
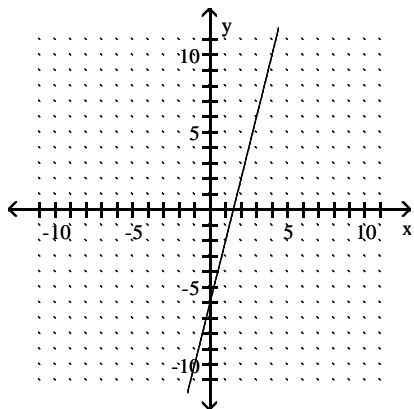
113)
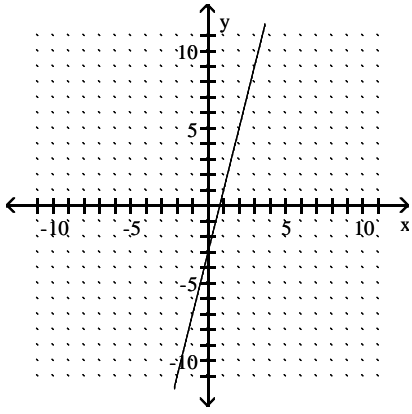
113) _____

114)

114) _____

115)

115) _____

116)

117)

118)
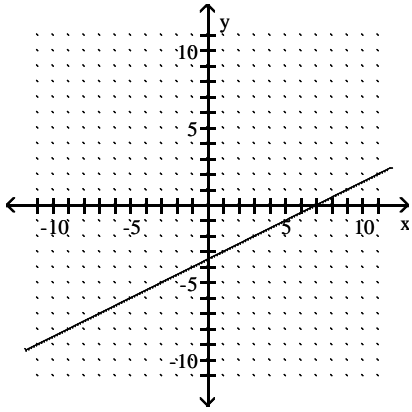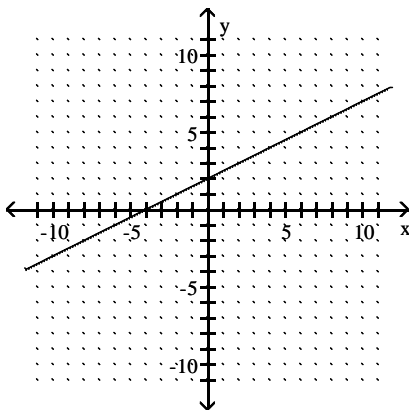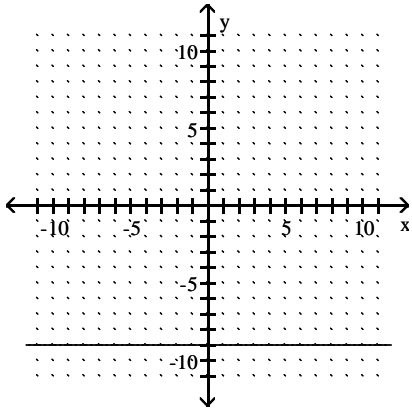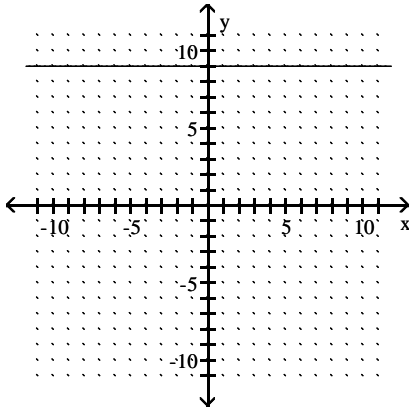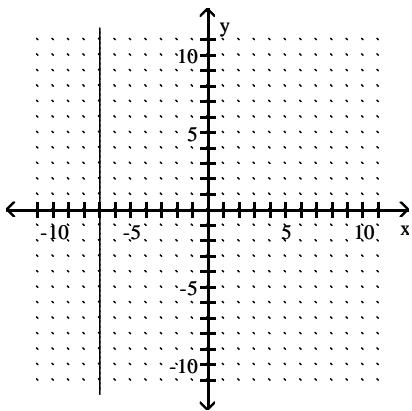
119)

Solve the system by the addition method. If there is no solution or an infinite number of solutions, so state. Use set notation to express the solution set.

120) $\begin{cases} x + y = -2 \\ x - y = -4 \end{cases}$

120) _____

121) $\begin{cases} x + y = 2 \\ x - y = -14 \end{cases}$

121) _____

122) $\begin{cases} x - 3y = -18 \\ 2x - 3y = -12 \end{cases}$

122) _____

123) $\begin{cases} -6x + 7y = -21 \\ -3x + 3y = -9 \end{cases}$

123) _____

124) $\begin{cases} -7x - 7y = -63 \\ -3x - 5y = -45 \end{cases}$

124) _____

125) $\begin{cases} \dfrac{1}{2}x + \dfrac{1}{2}y = 0 \\ \dfrac{1}{3}x - \dfrac{1}{3}y = 4 \end{cases}$

125) _____

126) $\begin{cases} \dfrac{1}{2}x + \dfrac{1}{2}y = 1 \\ \dfrac{1}{2}x - \dfrac{1}{2}y = 6 \end{cases}$

126) _____

Solve the problem.

127) Devon purchased tickets to an air show for 5 adults and 2 children. The total cost was $163. The cost of a child's ticket was $6 less than the cost of an adult's ticket. Find the price of an adult's ticket and a child's ticket.

127) _____

128) Devon purchased tickets to an air show for 6 adults and 2 children. The total cost was $114. The cost of a child's ticket was $7 less than the cost of an adult's ticket. Find the price of an adult's ticket and a child's ticket.

128) _____

129) A barge takes 3 hours to move (at a constant rate) downstream for 27 miles, helped by a current of 3 miles per hour. If the barge's engines are set at the same pace, find the time of its return trip against the current.

129) _____

130) A barge takes 2 hours to move (at a constant rate) downstream for 16 miles, helped by a current of 3 miles per hour. If the barge's engines are set at the same pace, find the time of its return trip against the current.

130) _____

131) Khang and Hector live 33.6 miles apart in southeastern Missouri. They decide to bicycle towards each other and meet somewhere in between. Hector's rate of speed is 40% of Khang's. They start out at the same time and meet 3 hours later. Find Hector's rate of speed.

131) _____

132) Khang and Hector live 81.6 miles apart in southeastern Missouri. They decide to bicycle towards each other and meet somewhere in between. Hector's rate of speed is 70% of Khang's. They start out at the same time and meet 4 hours later. Find Hector's rate of speed.

132) _____

133) Doreen and Irena plan to leave their houses at the same time, roller blade towards each other, and meet for lunch after 2 hours on the road. Doreen can maintain a speed of 6.3 miles per hour, which is 90% of Irena's speed. If they meet exactly as planned, what is the distance between their houses?

133) _____

134) Doreen and Irena plan to leave their houses at the same time, roller blade towards each other, and meet for lunch after 3 hours on the road. Doreen can maintain a speed of 2.4 miles per hour, which is 40% of Irena's speed. If they meet exactly as planned, what is the distance between their houses?

134) _____

135) On a buying trip in Los Angeles, Rosaria Perez ordered 120 pieces of jewelry: a number of bracelets at $4 each and a number of necklaces at $8 each. She wrote a check for $800 to pay for the order. How many bracelets and how many necklaces did Rosaria purchase?

135) _____

136) On a buying trip in Los Angeles, Rosaria Perez ordered 120 pieces of jewelry: a number of bracelets at $6 each and a number of necklaces at $8 each. She wrote a check for $920 to pay for the order. How many bracelets and how many necklaces did Rosaria purchase?

136) _____

1) (−6, ∞)
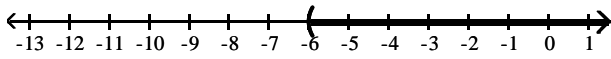
2) {x │ −1 < x ≤ 1}
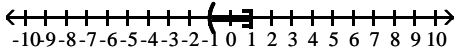
3) {x │ −5 < x ≤ 4}
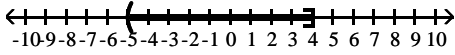
4) {x │ −6 ≤ x < 9}
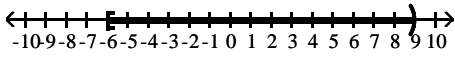
5) {x │ −2 ≤ x < 5}
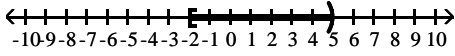
6) $\left\{ x \mid x < \dfrac{9}{2} \right\}$
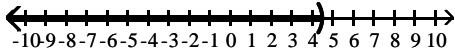
7) $\left\{ x \mid x < \dfrac{6}{5} \right\}$
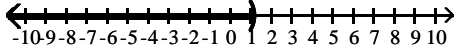
8) {x │ −1 ≤ x ≤ 7}
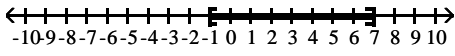
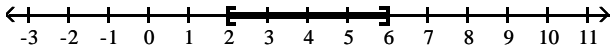
9) {x │ −2 ≤ x ≤ 4}
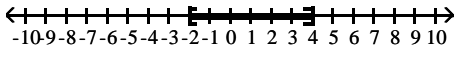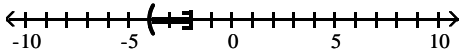

10) {x │ x > −6}
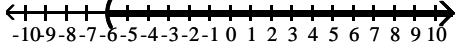
11) {x │ x > −4}
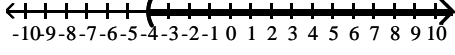
12) (3, 6]
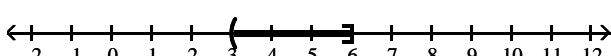
13) (−1, 5]
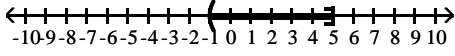
14) [4, 6]
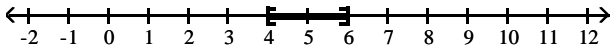
15) (4, 6]
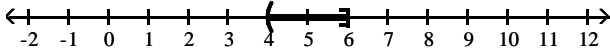
16) [2, 6]

17) (–4, –2]

18) [2, 6)
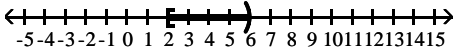
19) {x | x ≥ 2}
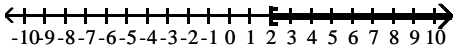
20) {x | x ≥ –8}
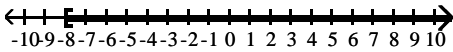
21) {x | x ≤ 2.5}
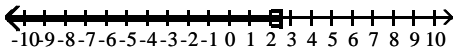
22) {x | x ≤ 2.5}

23) (–2, ∞)

24) [–7, ∞)

25) [–2, ∞)

26) (–3, ∞)

27) (5, ∞)
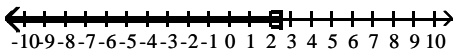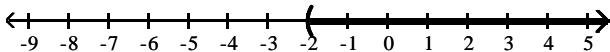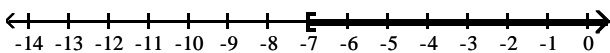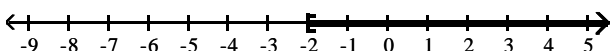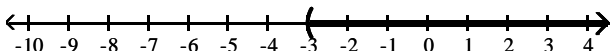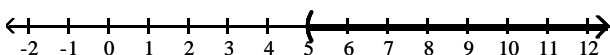
28) [1, ∞)
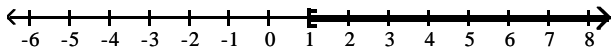
29) [4, ∞)
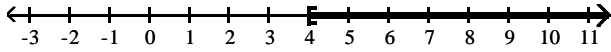
30) [–7, ∞)
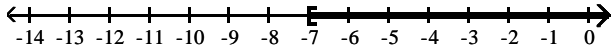
31) $4000
32) $2000
33) $20,000
34) $25,000
35) $27,000
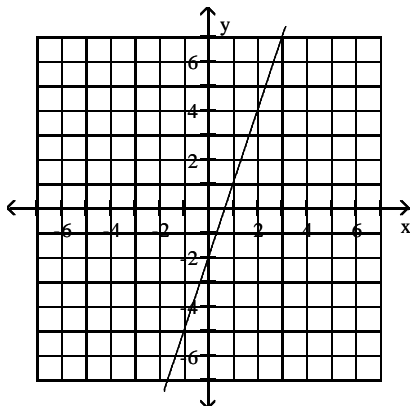36) 5 nickels and 40 dimes
37) 6 nickels and 42 dimes
38)
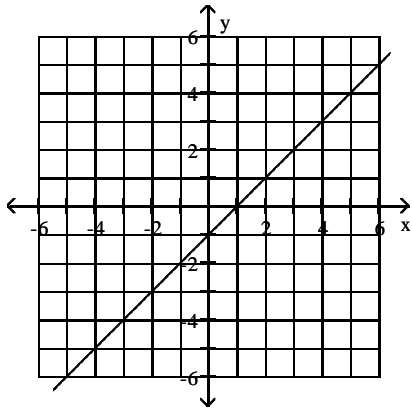
39)
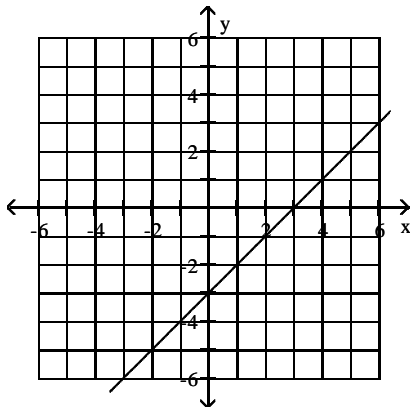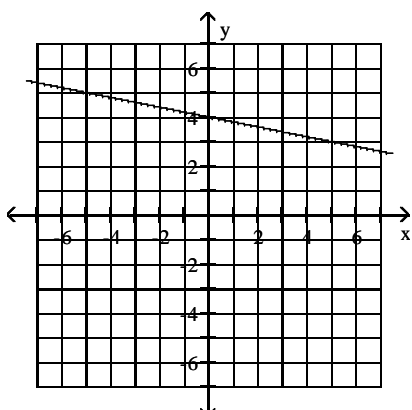
40)

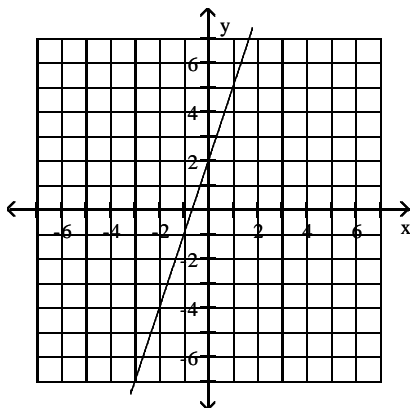

41)

42)

43)

44)

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51)

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54)

38 of 30

55)

56)

57)

58)
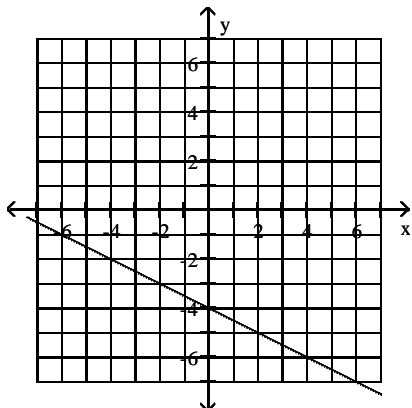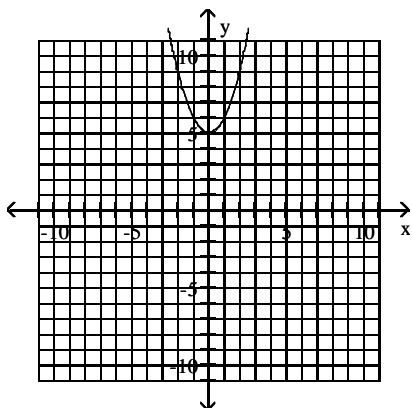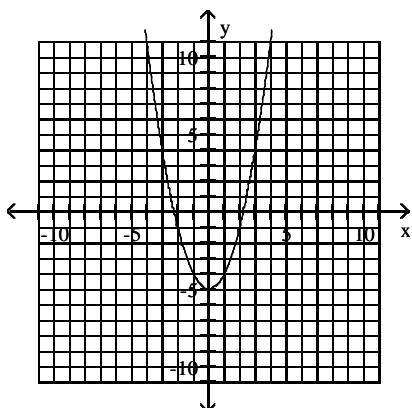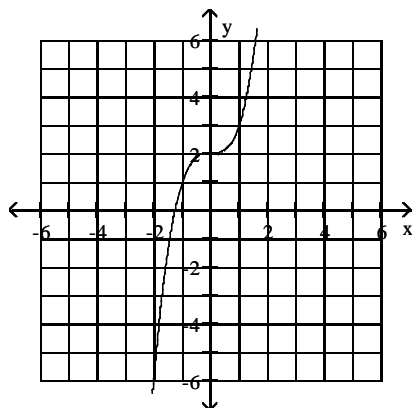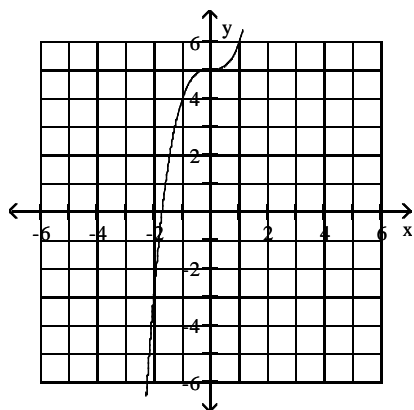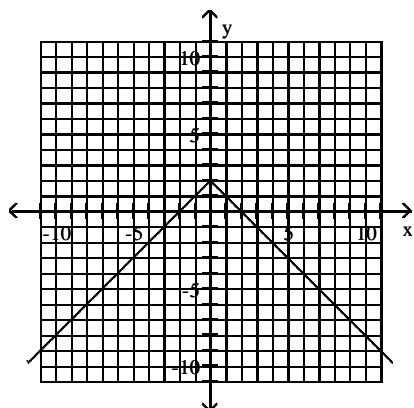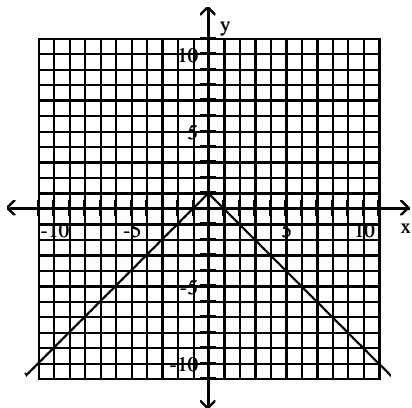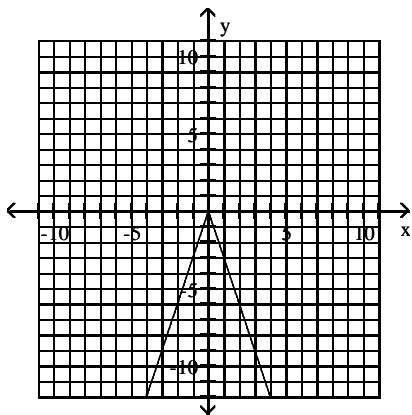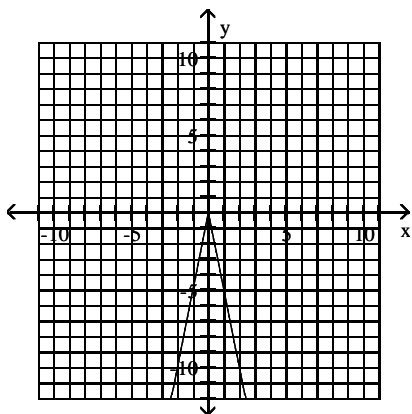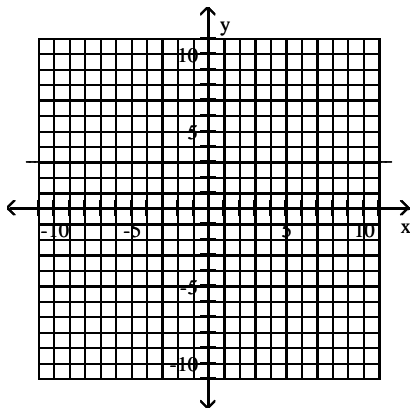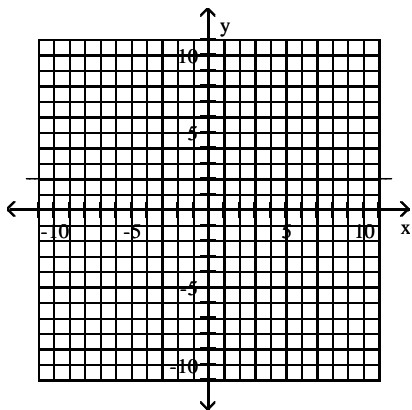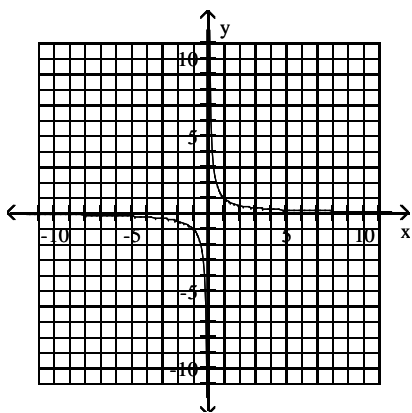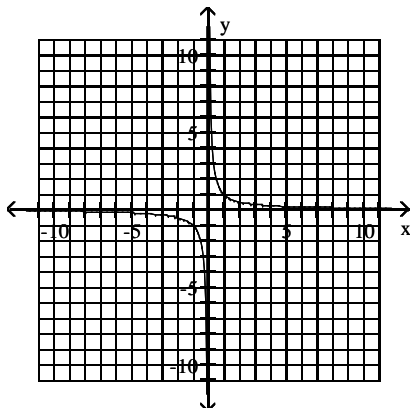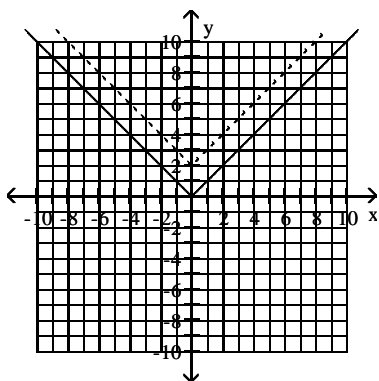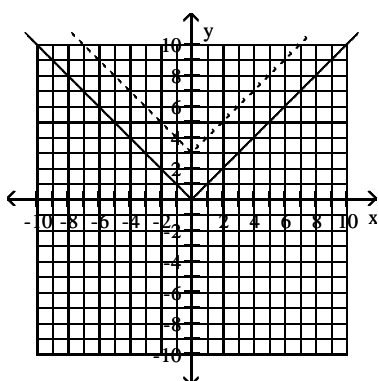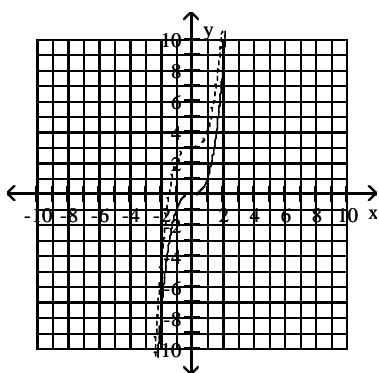
59)
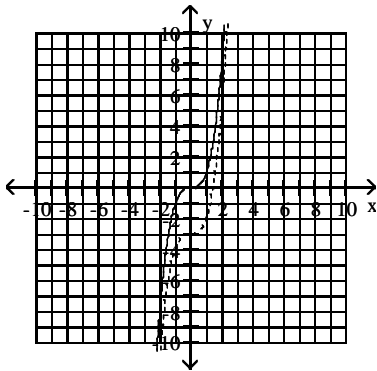
60) domain: {2, 2, 6}
   range: {5, 7, 1, 14}
   not a function

61) domain: {2, 8, 5}
   range: {5, 4, 3, 7}
   not a function

62) domain: {-2,-1, 1, 2}
   range: { 2, 5}
   function

63) domain: {-9,-3, 3, 9}
   range: { 6, 12}
   function

64) No

65) Yes

66) {(2, –7)}

67) {(9, 7)}

68) {(8, 9)}

69) {(2, –1)}

70) domain: all real numbers; range: y ≥ -3

71) domain: all real numbers; range: y ≥ - 1

72) domain: all real numbers; range: y ≥ 1

73) domain: all real numbers; range: y = 1

74) domain: all real numbers; range: all real numbers

75) domain: x ≥ 0; range: y ≥ 1

76) domain: all real numbers; range: –1 ≤ y ≤ 1

77) domain: all real numbers; range: 0 ≤ y ≤ 4

78) (6, ∞)

79) (8, ∞)

80) (–∞, 8) ∪ (8, ∞)

81) (–∞, –2) ∪ (–2, ∞)

82) (–∞, –5) ∪ (–5, ∞)

83) (–∞, –3) ∪ (–3, ∞)

84) (–∞, –3) ∪ (–3, ∞)

85) (–∞, 6) ∪ (6, ∞)

86) (–∞, 4) ∪ (4, 8) ∪ (8, ∞)

87) (–∞, 3) ∪ (3, 5) ∪ (5, ∞)

88) Function

89) Not a function

90) Function
91) 22
92) 7
93) –17
94) 3
95) 3
96) –3
97) –4.2
98) 2
99) 5
100) 9
101) 0
102) 22
103) 40
104) 14
105) –1
106) $-\dfrac{23}{10}$

107) $-\dfrac{19}{12}$

108) $\dfrac{3}{8}$

109) $\dfrac{9}{16}$

110) undefined
111) undefined
112) 4
113) 4
114) $\dfrac{1}{2}$

115) $\dfrac{1}{2}$

116) 0
117) 0
118) Undefined
119) Undefined
120) {(–3, 1)}
121) {(–6, 8)}
122) {(6, 8)}
123) {(0, –3)}
124) {(0, 9)}
125) {(6, –6)}
126) {(7, –5)}
127) adult's ticket: $25; child's ticket: $19
128) adult's ticket: $16; child's ticket: $9
129) 9 hours
130) 8 hours
131) 3.2 mph
132) 8.4 mph

133) 26.6 miles
134) 25.2 miles
135) 40 bracelets and 80 necklaces
136) 20 bracelets and 100 necklaces