Exam end start

Name_____

algebra final exam review161   aam0320201851t4highschool

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

Solve the equation.

1) $5(y + 2) = 6(y - 7)$ 1) _____

   A) 52   B) -52   C) -32   D) 32

   Objective: (3.3) Solve Linear Equations Containing Parentheses

Solve.

2) $\dfrac{x}{5} = \dfrac{x}{6} + \dfrac{2}{5}$ 2) _____

   A) 12   B) $-\dfrac{2}{5}$ C) 0   D) $\dfrac{1}{12}$

   Objective: (4.8) Solve Equations Containing Fractions

Solve the equation.

3) $1.1x + 4.3 = 0.7x + 1.14$ 3) _____

   A) -7.9   B) -7.8   C) 0.127   D) -7.11

   Objective: (5.6) Solve Equations Containing Decimals

4) $5(x - 1.2) = 9.3$ 4) _____

   A) 3.06   B) 1.62   C) 2.1   D) 15.3

   Objective: (5.6) Solve Equations Containing Decimals

5) $8(3x - 0.2) = 7x - 1.6$ 5) _____

   A) 0   B) 0.188   C) -0.082   D) 17

   Objective: (5.6) Solve Equations Containing Decimals

Solve the proportion.

6) $\dfrac{4}{13} = \dfrac{x}{39}$ 6) _____

   A) 12   B) $1\dfrac{1}{3}$ C) $126\dfrac{3}{4}$ D) 16

   Objective: (6.1) Solve Proportions

Solve.

7) The scale on a map states that 1 centimeter corresponds to 40 kilometers. On the map, two cities   7) _____
   are 21 cm apart. Find the actual distance.

   A) 840 km   B) 84 km   C) 8400 km   D) 84,000 km

   Objective: (6.1) Solve Problems Modeled by Proportions

Find the total amount in the compound interest account.

    8) $18,000 at 5% compounded annually for 5 years   8) _____

        A) $22,973.07   B) $21,879.11   C) $21,600.00   D) $22,500.00

Solve the equation.

    9) $9x + 5 - 9x - 5 = 6x - 6x - 3$ 9) _____

        A) 0   B) –288

        C) all real numbers   D) no solution

    10) $2(x + 5) = (2x + 10)$ 10) _____

        A) 20   B) 0

        C) all real numbers   D) no solution

Solve.

    11) You have taken up gardening for relaxation and have decided to fence in your new rectangular   11) _____
        shaped masterpiece. The length of the garden is 12 meters and 46 meters of fencing is required to
        completely enclose it. What is the width of the garden?

        A) 11 m   B) 552 m   C) 3.83 m   D) 22 m

Solve the equation for the indicated variable.

    12) $A = P + PRT$ for T   12) _____

        A) $T = \dfrac{A - P}{PR}$ B) $T = \dfrac{P - A}{PR}$ C) $T = \dfrac{A}{R}$ D) $T = \dfrac{PR}{A - P}$

Solve the inequality.

    13) $-7x - 8 \le -8x - 13$ 13) _____
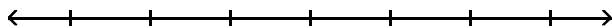
        A) $(-\infty, -5]$
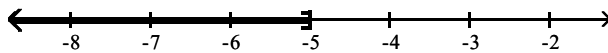
        B) $[-5, \infty)$
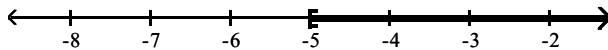
        C) $(-\infty, -7)$
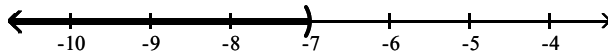
        D) $(-7, \infty)$
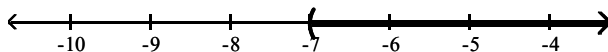
14) $\dfrac{y}{2} \geq 4$

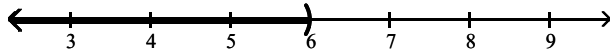14) _____

A) [8, ∞)

B) (-∞, 8)

C) (-∞, 8]

D) (8, ∞)

Solve the inequality. Graph the solution set and write it in interval notation.

15) −2(3x + 14) < −8x − 16

15) _____

A) (−∞, 6)

B) (−∞, 6]

C) [6, ∞)

D) (6, ∞)

3

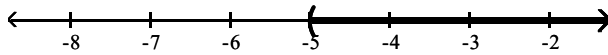16) $-16x - 32 \le -4(3x + 3)$ 16) _____

A) [−5, ∞)

B) (−∞, −5)

C) (−∞, −5]

D) (−5, ∞)
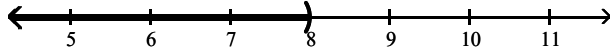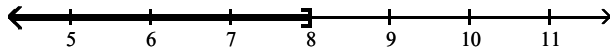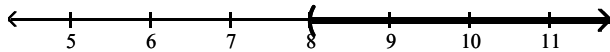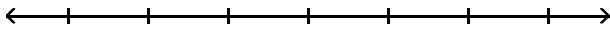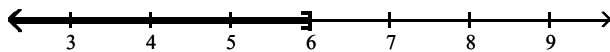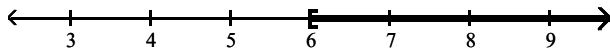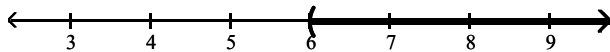
Objective: (9.6) Use Both Properties to Solve Inequalities

Solve.

17) The area of a rectangle must be at least 84 square feet. If the length is 7 feet, find the minimum for   17) _____
the rectangle's width.

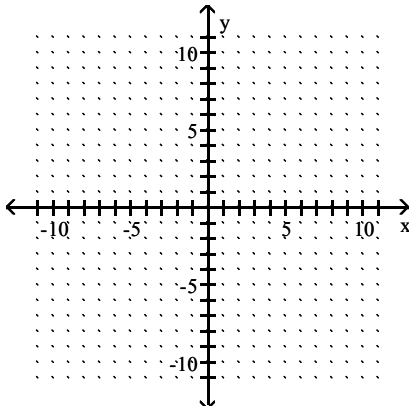   A) 12 ft   B) 35 ft   C) 13 ft   D) $\dfrac{1}{12}$ ft

Objective: (9.6) Solve Problems Modeled by Inequalities

Find three ordered pair solutions by completing the table. Then use the ordered pairs to graph the equation.
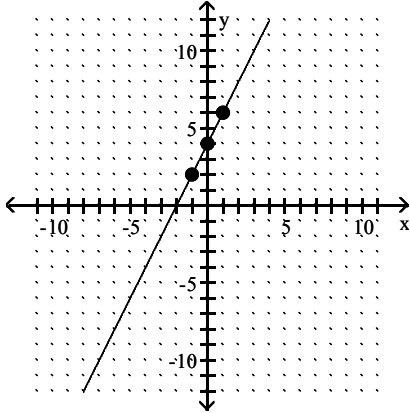
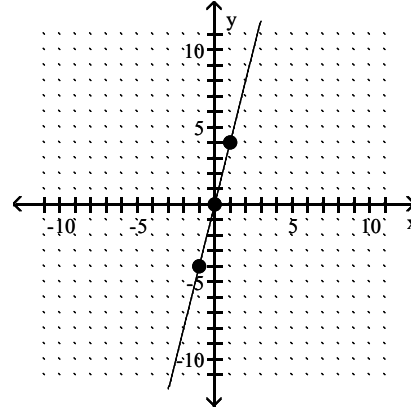18) y = 2x + 4   18) _____
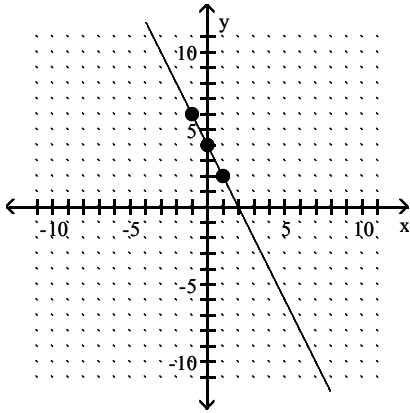
x	y
0	
1	
−1	

A)

x	y
0	4
1	6
−1	2

B)

x	y
0	0
1	4
−1	−4

C)

x	y
0	4
1	2
−1	6

D)

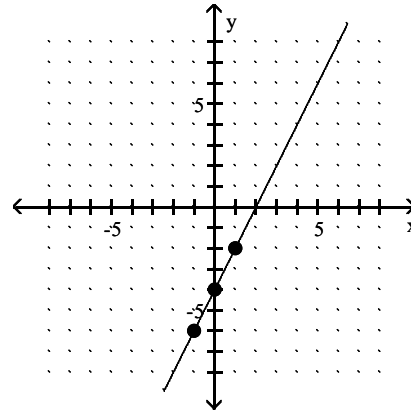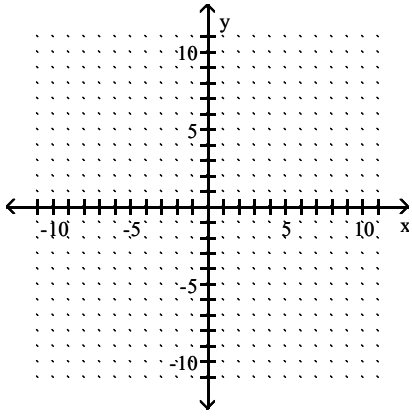| x	y
0	−4
1	−2
−1	−6

Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.

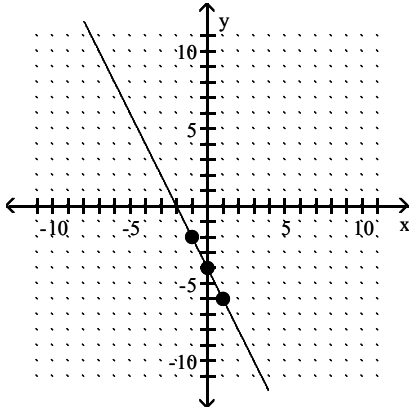19) $y = -2x - 4$ 19) _____
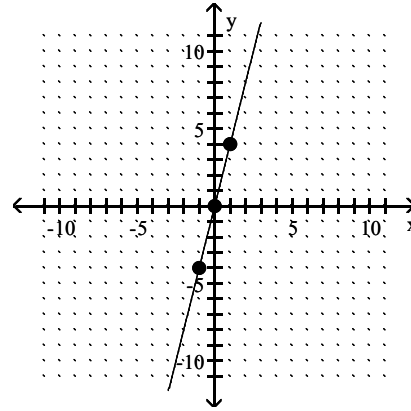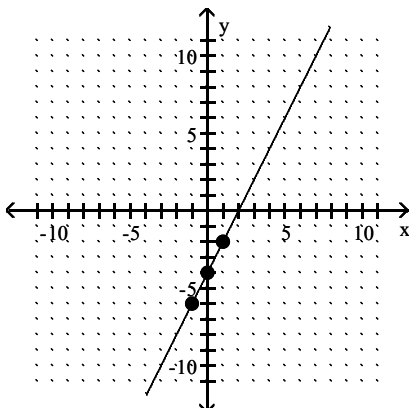
x	y
0	
1	
−1	

5

A)

x	y
0	-4
1	-6
-1	-2

B)

x	y
0	0
1	4
-1	-4

C)

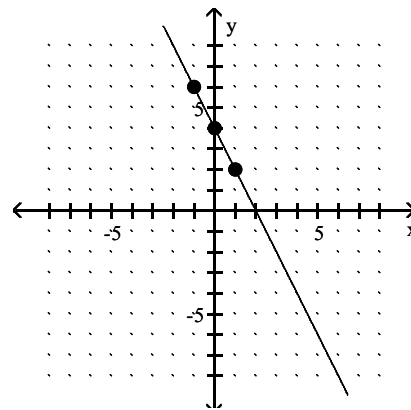| x	y
0	-4
1	-2
-1	-6

D)

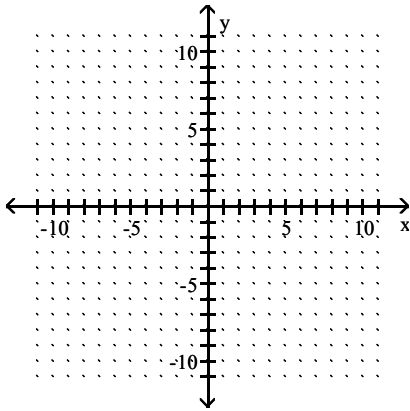| x	y
0	4
1	2
-1	6

Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
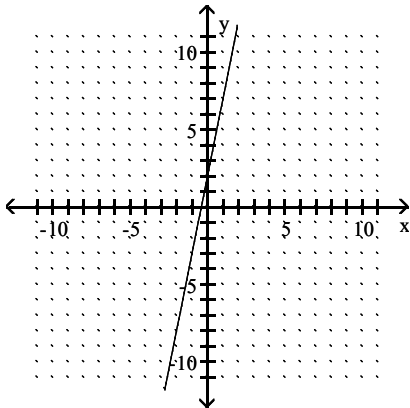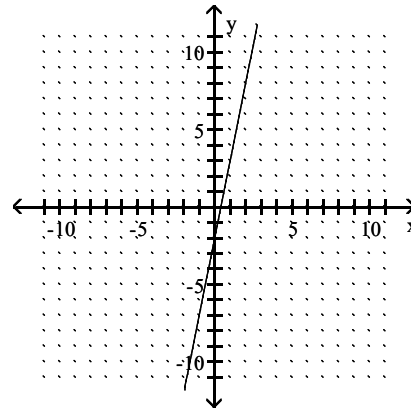
Graph the linear equation.

6

20) $5y - 25x = 10$

20) _____

A)

B)

C)

D)

Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.

21) y = 5x

21) _____

A)

B)

C)

D)
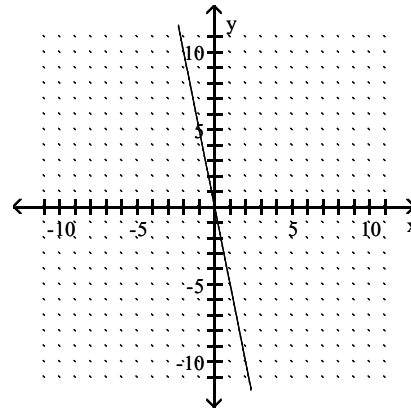
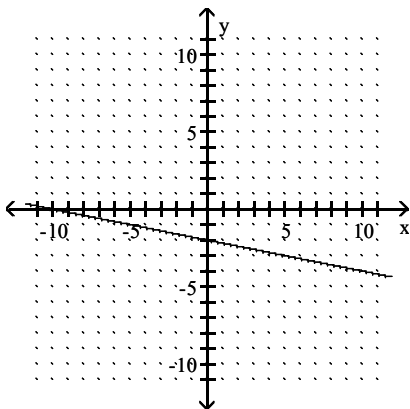Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
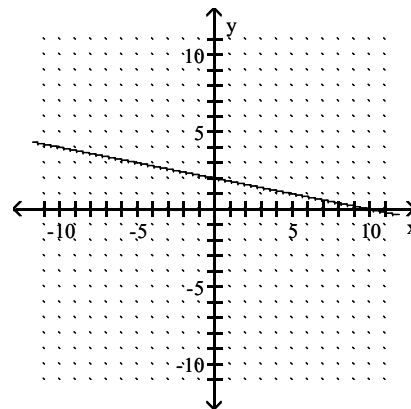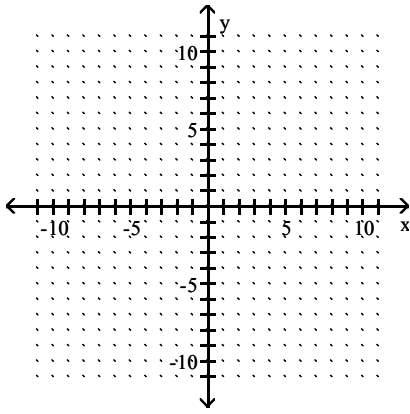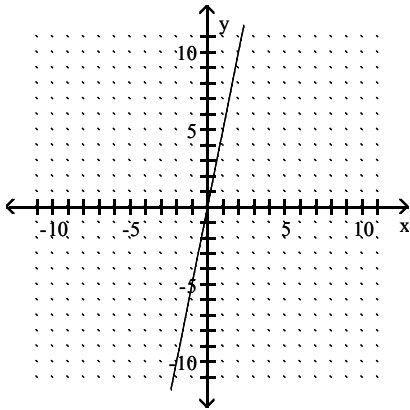
22) y = −7
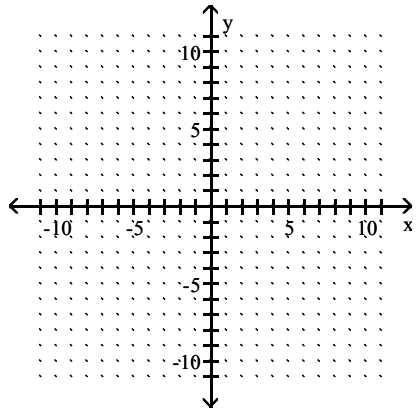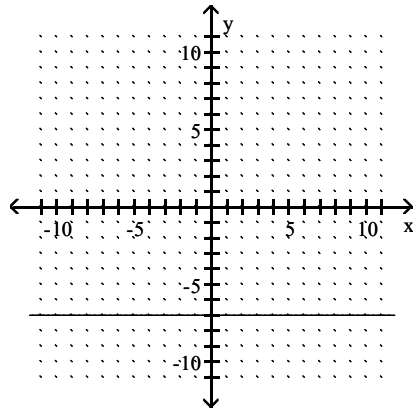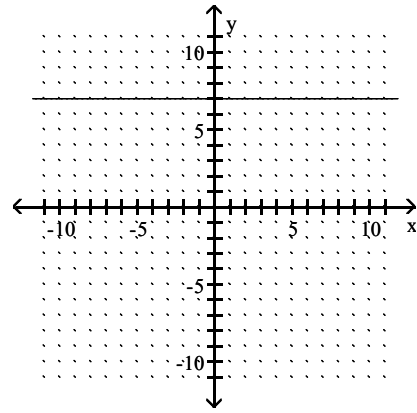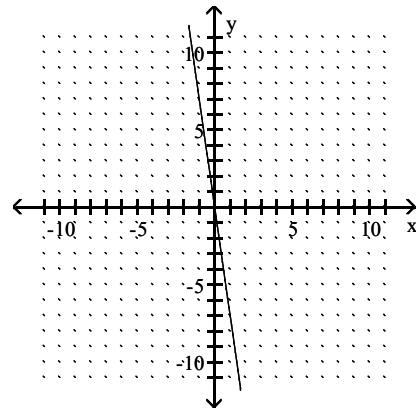
A)

B)

C)

D)

Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.
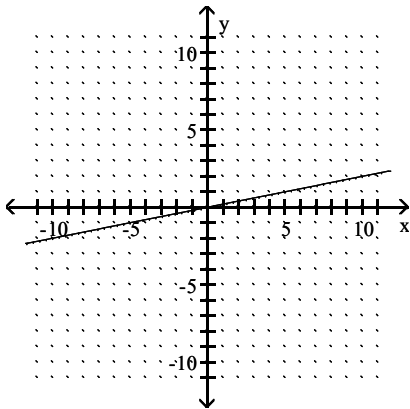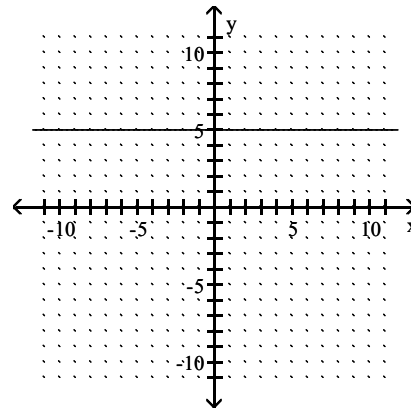
9

23) x = −5

23) _____

A)

B)

C)

D)
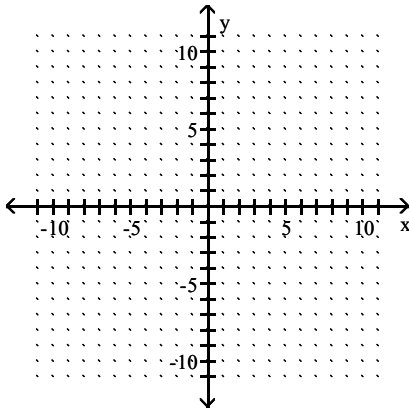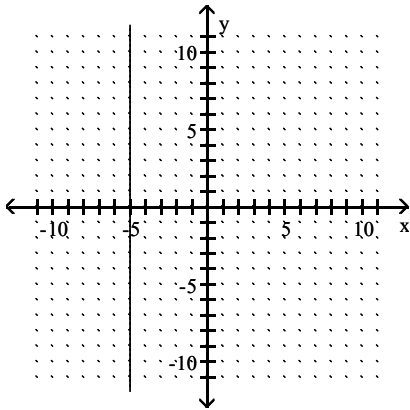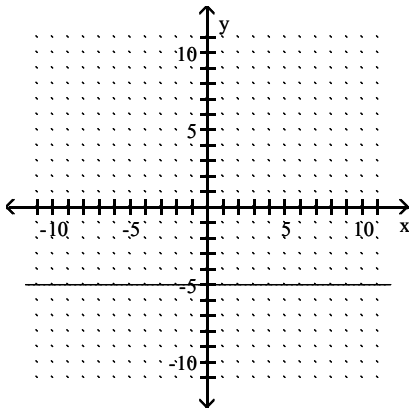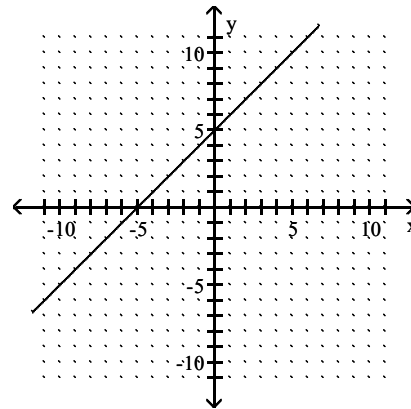
Objective: (10.2) Graph a linear equation by finding and plotting ordered pair solutions.

Identify the intercepts.

24)
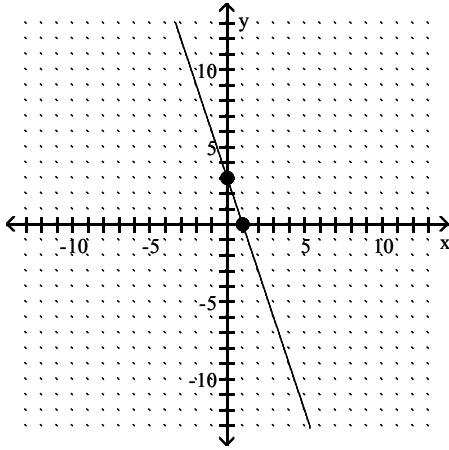
    A) (1, 0), (0, 3)   B) (–1, 0), (0, 3)   C) (1, 0), (0, –3)   D) (–3, 0), (0, 3)

Objective: (10.3) Identify intercepts of a graph.

24) _____

Graph the linear equation by finding and plotting its intercepts.

25) $-x + 4y = -4$

25) _____

A)

B)

11
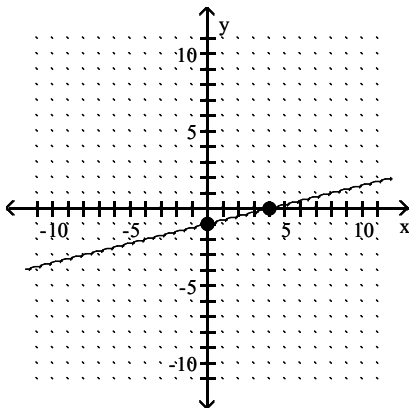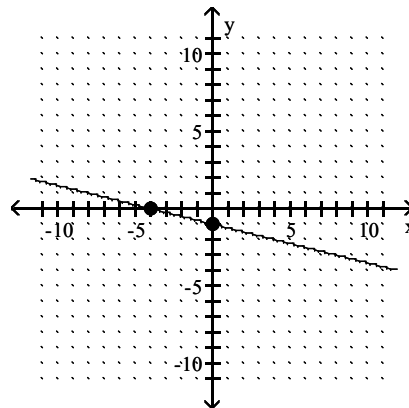
C)
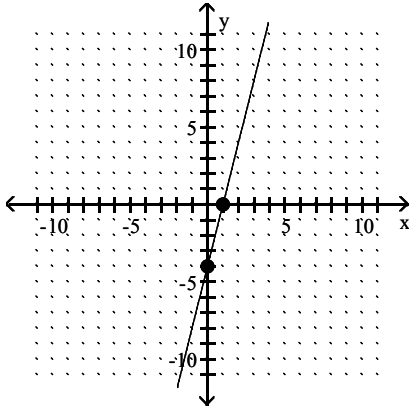
D)

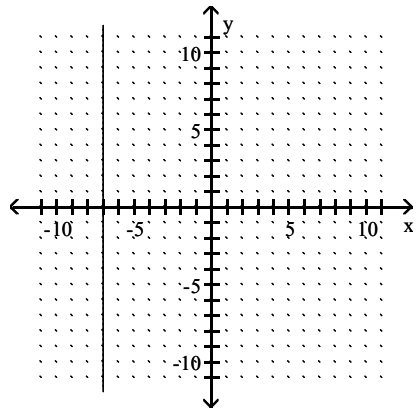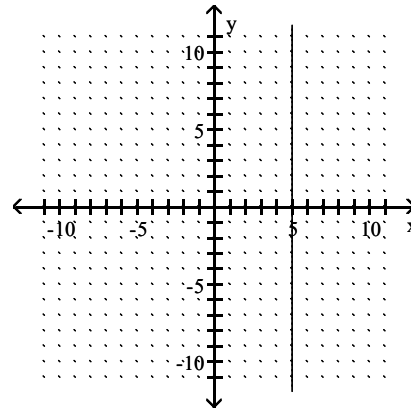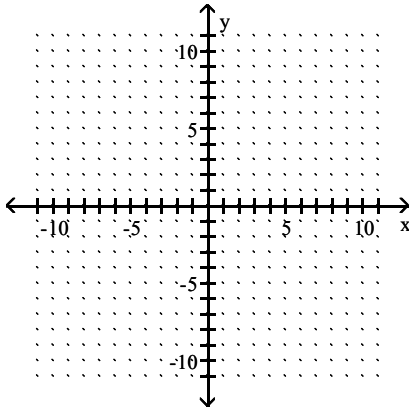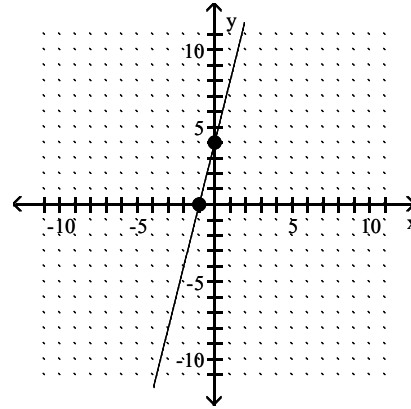Objective: (10.3) Graph a linear equation by finding and plotting intercepts.

26) –5x – y = – 10

26) _____

A)

B)

C)

D)

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

27) (8, 5) and (6, 9)   27) _____

   A) – 2   B) $-\dfrac{1}{2}$ C) 1   D) 2

28) (–6, 9) and (–1, 6)   28) _____

   A) $-\dfrac{3}{5}$ B) $-\dfrac{5}{3}$ C) $-\dfrac{15}{7}$ D) $\dfrac{3}{5}$

Find the slope of the line.

29) y = –7x – 8   29) _____

   A) m = –7   B) m = –8   C) m = 7   D) $m = -\dfrac{1}{7}$

30) 8x – 5y = 40   30) _____

   A) $m = \dfrac{8}{5}$ B) $m = -\dfrac{8}{5}$ C) $m = \dfrac{5}{8}$ D) m = 8

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

31) y = –5x + 1   31) _____
    y = 5x – 8
       A) parallel   B) perpendicular   C) neither

32) $y = \dfrac{5}{2}x + 2$ 32) _____

    $y = -\dfrac{2}{5}x + 5$

       A) parallel   B) perpendicular   C) neither

13

33) $y = 4x + 4$
$x - 4y = 8$

A) parallel   B) perpendicular   C) neither

33) _____

Find the slope of the line and write the slope as a rate of change. Don't forget to attach the proper units.

34) The graph shows the total cost y (in dollars) of owning and operating a mini–van where x is the number of miles driven.

34) _____
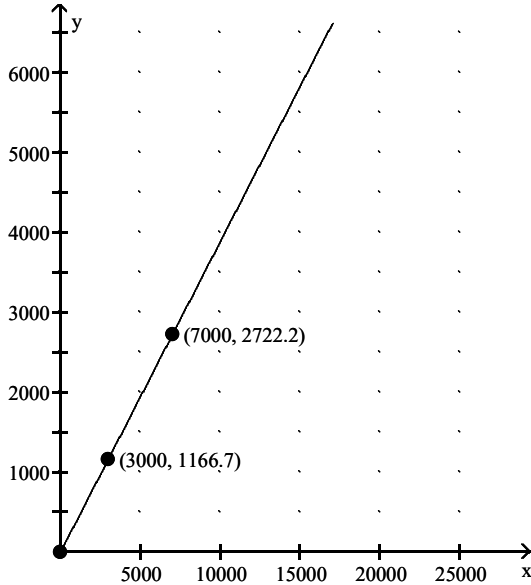
A) $0.39 per mile   B) $2.57 per mile
C) $25.00 per mile   D) cannot be determined

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

35) $m = -8$, $b = -2$

A) $y = -8x - 2$ B) $y = -2x - 8$ C) $y = 8x + 2$ D) $y = 2x + 8$

35) _____

Find an equation of the line with the given slope that passes through the given point. Write the equation in the form Ax + By = C.

36) $m = 3$; (5, 9)

A) $3x - y = 6$ B) $3x - y = 22$ C) $3x - y = -9$ D) $3x - y = -24$

36) _____

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

37) Slope 2, through (5, 2)

A) $y = 2x - 8$ B) $y = 2x + 8$ C) $x = 2y - 8$ D) $x = 2y + 8$

37) _____

Find an equation of the line through the pair of points. Write the equation in the form Ax + By = C.

38) (–6, 3) and (0, –2)

    A) –5x – 6y = 12   B) 5x – 6y = 12   C) 9x – 2y = –4   D) –9x + 2y = –4

Objective: (10.5) Use the point–slope form to find an equation given two points of the line.

38) _____

Evaluate the function.

39) Find $f(4)$ when $f(x) = x^2 + 4x - 3$.

    A) 29   B) 35   C) 3   D) –3

Objective: (10.6) Use function notation.

39) _____

40) Find $f(7)$ when $f(x) = 9x - 9$

    A) 54   B) 72   C) 55   D) 0

Objective: (10.6) Use function notation.

40) _____

41) Find $f(19)$ when $f(x) = |x - 1|$

    A) 18   B) –20   C) 20   D) –18

Objective: (10.6) Use function notation.

41) _____

Find the domain and range of the function graphed.

42)

42) _____
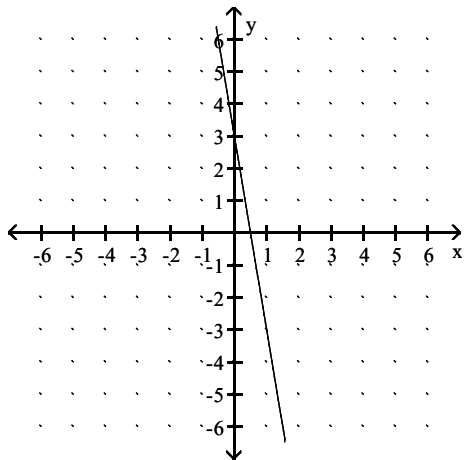
    A) domain: (–∞, ∞); range: (–∞, ∞)   B) domain: (–∞, ∞); range: {3}

    C) domain: $\left\{\dfrac{1}{2}\right\}$; range: (–∞, ∞)   D) domain: $\left\{\dfrac{1}{2}\right\}$; range: {3}

Objective: (10.6) Use function notation.

43)

A) domain: (–∞, ∞); range: {4}   B) domain: (–∞, ∞); range: (–∞, ∞)
C) domain: (–∞, ∞); range: (–∞, 4) ∪ (4, ∞)   D) domain: (–∞, 4) ∪ (4, ∞); range: (–∞, ∞)

Objective: (10.6) Use function notation.

43) _____

44)

(-5, -4)
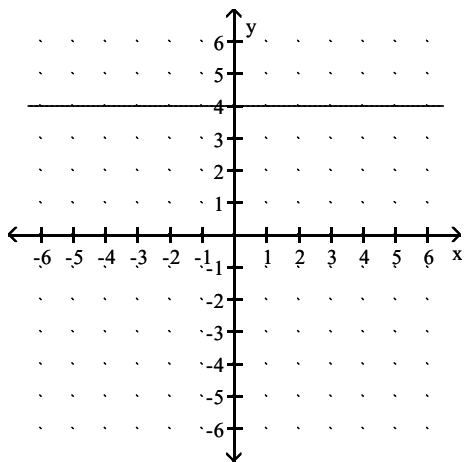
A) domain: (–∞, ∞); range: [–4, ∞)
B) domain: [–5, ∞); range: [–4, ∞)
C) domain: (–∞, ∞); range: (–∞, ∞)
D) domain: (–∞, –5) ∪ (–5, ∞); range: (–∞, –4) ∪ (–4, ∞)

Objective: (10.6) Use function notation.

44) _____

45)

   A) domain: (–∞, ∞); range: (–∞, 4]
   B) domain: (–∞, ∞); range: (–∞, ∞)
   C) domain: (–∞, –2]; range: (–∞, 4]
   D) domain: (–∞, –2) ∪ (–2, ∞); range: (–∞, 4) ∪ (4, ∞)

Objective: (10.6) Use function notation.

45) _____

Determine whether the ordered pair is a solution of the system of linear equations.

46) (–3, 3);
$$\begin{cases} x + y = 0 \\ x - y = -6 \end{cases}$$
   A) Yes   B) No

Objective: (11.1) Determine if an ordered pair is a solution of a system of equations in two variables.

46) _____

47) (3, –4);
$$\begin{cases} 3x + y = 5 \\ 4x + 3y = 0 \end{cases}$$
   A) Yes   B) No

Objective: (11.1) Determine if an ordered pair is a solution of a system of equations in two variables.

47) _____

48) (–3, 5);
$$\begin{cases} 4x + y = -17 \\ 2x + 4y = -26 \end{cases}$$
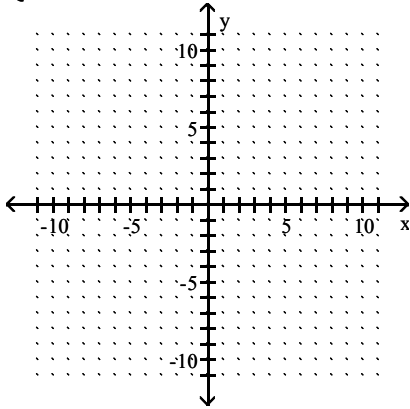   A) Yes   B) No

Objective: (11.1) Determine if an ordered pair is a solution of a system of equations in two variables.

48) _____

Solve the system of equations by graphing.

49) $\begin{cases} y = x - 3 \\ y = 2x - 1 \end{cases}$

49) _____

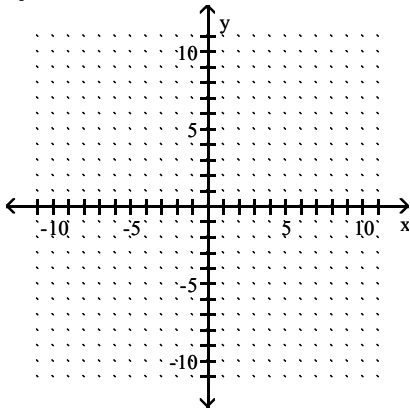   A) (–2, –5)   B) (–5, –2)   C) (2, 5)   D) no solution

Objective: (11.1) Solve a system of linear equations by graphing.

50) $\begin{cases} x + y = -3 \\ x + y = -4 \end{cases}$

50) _____

   A) no solution   B) (–2, –1)   C) (–2, –2)   D) (–4, 1)

Objective: (11.1) Solve a system of linear equations by graphing.

Solve the system of equations by the substitution method.

51) $\begin{cases} x + y = 56 \\ y = -9x \end{cases}$

51) _____

   A) (–7, 63)   B) (63, –7)

   C) infinite number of solutions   D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.

52) $\begin{cases} y = 4x - 1 \\ 4y - 20x = -24 \end{cases}$

52) _____

   A) (5, 19)   B) (19, 5)

   C) infinite number of solutions   D) no solution

Objective: (11.2) Use the substitution method to solve a system of linear equations.

53) $\begin{cases} x + 5y = -1 \\ -4x + 4y = -44 \end{cases}$

    A) (9, –2)   B) (8, –1)   C) (–9, –1)   D) no solution

53) _____

Objective: (11.2) Use the substitution method to solve a system of linear equations.

54) $\begin{cases} -2x + y = -10 \\ -3x + 3y = -18 \end{cases}$

    A) (4, –2)   B) (5, –3)   C) (–2, 4)   D) no solution

54) _____

Objective: (11.2) Use the substitution method to solve a system of linear equations.

55) $\begin{cases} 3x + y = 9 \\ 9x + 3y = 27 \end{cases}$

    A) infinite number of solutions   B) (0, 9)

    C) (5, –6)   D) no solution

55) _____

Objective: (11.2) Use the substitution method to solve a system of linear equations.

56) $\begin{cases} -6x - 24y = 7 \\ 2x + 8y = 0 \end{cases}$

    A) no solution   B) (0, 7)

    C) (7, 0)   D) infinite number of solutions

56) _____

Objective: (11.2) Use the substitution method to solve a system of linear equations.

Solve the system of equations by the addition method.

57) $\begin{cases} 5x + y = -58 \\ 5x - y = 8 \end{cases}$

    A) (–5, –33)   B) (–33, –5)

    C) infinite number of solutions   D) no solution

57) _____

Objective: (11.3) Use the addition method to solve a system of linear equations.

58) $\begin{cases} x - 7y = -66 \\ -6x - 8y = -54 \end{cases}$

    A) (–3, 9)   B) (–4, 10)   C) (3, 10)   D) no solution

58) _____

Objective: (11.3) Use the addition method to solve a system of linear equations.

59) $\begin{cases} 3x + 7y = -13 \\ 7x + 3y = 23 \end{cases}$

    A) (5, –4)   B) (–5, 4)   C) (5, 4)   D) (–5, –4)

59) _____

Objective: (11.3) Use the addition method to solve a system of linear equations.

Without actually solving the problem, choose the correct solution by deciding which choice satisfies the given conditions.

60) Jorge has a total of 50 coins, all of which are either dimes or nickels. The total value of the coins is $4.15. Find the number of each type of coin.

    A) 17 nickels; 33 dimes   B) 19 nickels; 31 dimes

    C) 22 nickels; 28 dimes   D) 33 nickels; 17 dimes

60) _____

Objective: (11.5) Solve problems that can be modeled by a system of two linear equations.

Solve.

61) Devon purchased tickets to an air show for 8 adults and 2 children. The total cost was $158. 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.

61) _____

    A) adult's ticket: $17; child's ticket: $11   B) adult's ticket: $18; child's ticket: $12
    C) adult's ticket: $16; child's ticket: $10   D) adult's ticket: $19; child's ticket: $13

62) University Theater sold 579 tickets for a play. Tickets cost $22 per adult and $11 per senior citizen.
If total receipts were $8503, how many senior citizen tickets were sold?

62) _____

    A) 385 senior citizen tickets   B) 194 senior citizen tickets
    C) 295 senior citizen tickets   D) 284 senior citizen tickets

63) A vendor sells hot dogs and bags of potato chips. A customer buys 3 hot dogs and 5 bags of potato
chips for $13.00. Another customer buys 5 hot dogs and 2 bags of potato chips for $13.75. Find the
cost of each item.

63) _____

    A) $2.25 for a hot dog; $1.25 for a bag of potato chips
    B) $1.25 for a hot dog; $2.25 for a bag of potato chips
    C) $2.50 for a hot dog; $1.50 for a bag of potato chips
    D) $2.25 for a hot dog; $1.50 for a bag of potato chips

Use the power rule and the power of a product or quotient rule to simplify the expression.

64) $(4x^3y^3)^2$

64) _____

    A) $16x^6y^6$ B) $4x^5y^5$ C) $4x^6y^6$ D) $16x^5y^5$

Use the quotient rule to simplify the expression.

65) $\dfrac{45m^3n^7}{9m^2n^5}$

65) _____

    A) $5mn^2$ B) $45mn^2$ C) $5m^5n^{12}$ D) $5n^2$

Multiply.

66) $7x^3(-2x^2)$

66) _____

    A) $-14x^5$ B) $14x^5$ C) $-14x^6$ D) $14x^6$

67) $(a + 8)(a + 1)$

67) _____

    A) $a^2 + 9a + 8$ B) $a^2 + 9a + 9$ C) $2a^2 + 8$ D) $2a + 8$

68) $(x - 4)(x - 6)$

68) _____

    A) $x^2 - 10x + 24$ B) $x^2 + 10x - 24$ C) $2x^2 - 24$ D) $2x + 24$

69) $(9z + 11)^2$ 69) _____

    A) $81z^2 + 198z + 121$ B) $81z^2 + 121$

    C) $9z^2 + 198z + 121$ D) $9z^2 + 121$

70) $(x + 12)(x^3 + 2x - 5)$ 70) _____

    A) $x^4 + 12x^3 + 2x^2 + 19x - 60$ B) $x^3 + 14x^2 + 19x - 60$

    C) $x^4 + 2x^2 - 5x + 12$ D) $x^4 + 12x^3 + 2x^2 + 29x + 60$

71) $(8x - 1)(x^2 - 3x + 1)$ 71) _____

    A) $8x^3 - 25x^2 + 11x - 1$ B) $8x^3 - 23x^2 + 5x - 1$

    C) $8x^3 - 24x^2 + 8x + 1$ D) $8x^3 + 25x^2 - 11x + 1$

Solve.

72) Find the volume of the rectangular solid. Express the volume as a product, then multiply and simplify.   72) _____
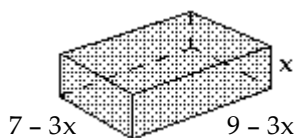
    A) $9x^3 - 48x^2 + 63x$ B) $9x^2 - 48x + 64$

    C) $-9x^3 + 36x^2 + 63x$ D) $-9x^2 + 36x + 64$

Multiply.

73) $(3a - 7)^2$ 73) _____

    A) $9a^2 - 42a + 49$ B) $9a^2 + 49$ C) $3a^2 - 42a + 49$ D) $3a^2 + 49$

74) $(a - 1)(a + 1)$ 74) _____

    A) $a^2 - 1$ B) $a^2 - 2$ C) $a^2 - 2a - 1$ D) $a^2 + 2a - 1$

Simplify the expression. Write the result using positive exponents only.

75) $\dfrac{2^{-7}x^{-5}y^3}{2^{-4}x^{-8}y^6}$ 75) _____

    A) $\dfrac{x^3}{8y^3}$ B) $\dfrac{1}{8x^8y^3}$ C) $\dfrac{3x^3}{y^3}$ D) $\dfrac{8}{x^3y^3}$

Perform the division.

76) $\dfrac{-12x^{10} - 9x^7}{-3x^4}$

76) _____

    A) $4x^6 + 3x^3$ B) $4x^6 - 9x^7$ C) $-12x^{10} + 3x^3$ D) $7x^{13}$

Factor out the GCF from the polynomial.

77) $30x + 10$

77) _____

    A) $10(3x + 1)$ B) $5(6x + 2)$ C) $2(15x + 5)$ D) $10(3x)$

78) $21x^3 - 6x^2 + 12x$

78) _____

    A) $3x(7x^2 - 2x + 4)$ B) $3(7x^3 - 2x^2 + 4x)$

    C) $x(21x^2 - 6x + 12)$ D) $3x(7x^3 - 2x^2 + 4x)$

79) $20x^4y + 36xy^3$

79) _____

    A) $4xy(5x^3 + 9y^2)$ B) $xy(20x^3 + 36y^2)$ C) $4x(5x^3y + 9y^3)$ D) $4y(5x^4 + 9xy^2)$

Factor the four–term polynomial by grouping.

80) $2x + 24 + xy + 12y$

80) _____

    A) $(x + 12)(2 + y)$ B) $(y + 12)(x + 2)$ C) $(x + 12y)(2 + y)$ D) $(y + 12)(2x + y)$

81) $xy + 11x - 8y - 88$

81) _____

    A) $(y + 11)(x - 8)$ B) $(y - 11)(x + 8)$ C) $(x - 11)(y + 8)$ D) $(x + 11)(y - 8)$

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."

82) $x^2 - x - 42$

82) _____

    A) $(x + 6)(x - 7)$ B) $(x + 7)(x - 6)$ C) $(x + 1)(x - 42)$ D) prime

83) $x^2 + x - 30$

83) _____

    A) $(x - 5)(x + 6)$ B) $(x - 6)(x + 5)$ C) $(x + 1)(x - 30)$ D) prime

84) $x^2 - 3x - 88$

84) _____

    A) $(x - 11)(x + 8)$ B) $(x + 11)(x - 8)$ C) $(x - 88)(x + 1)$ D) prime

85) $3x - 10 + x^2$

85) _____

    A) $(x + 5)(x - 2)$ B) $(x - 5)(x + 2)$ C) $(x - 5)(x + 1)$ D) prime

Factor the binomial completely.

86) $z^2 - 121$

    A) $(z + 11)(z - 11)$ B) $(z + 11)^2$ C) $(z - 11)^2$ D) prime

86) _____

87) $81x^2 - 49$

    A) $(9x + 7)(9x - 7)$ B) $(9x - 7)^2$ C) $(9x + 7)^2$ D) prime

87) _____

Solve the equation.

88) $(x - 6)(x + 4) = 0$

    A) 6, –4   B) –6, 4   C) 6, –6, 4, –4   D) 6, 4

88) _____

89) $(2x + 1)(5x - 3) = 0$

    A) $-\dfrac{1}{2}, \dfrac{3}{5}$ B) $\dfrac{1}{2}, -\dfrac{3}{5}$ C) 1, 2   D) $2, \dfrac{5}{3}$

89) _____

90) $x^2 + 2x - 80 = 0$

    A) –10, 8   B) 10, 8   C) –10, 1   D) 10, –8

90) _____

91) $x^2 - 7x - 18 = 0$

    A) 9, – 2   B) –9, 2   C) –9, – 2   D) –18, 0

91) _____

92) $x^2 + 8x + 12 = 0$

    A) – 6, – 2   B) 6, 2   C) 6, – 2   D) 12, 0

m50–4

92) _____

93) $x^2 - x = 72$

    A) –8, 9   B) 8, 9   C) 1, 72   D) –8, –9

93) _____

94) $2x^2 - 7x - 9 = 0$

    A) $\dfrac{9}{2}, -1$ B) $\dfrac{2}{9}, -1$ C) $\dfrac{2}{9}, 1$ D) $\dfrac{2}{9}, 0$

94) _____

95) $15x^2 - 8x = 0$

    A) $\dfrac{8}{15}, 0$ B) $\dfrac{15}{8}, 0$ C) $-\dfrac{8}{15}, 0$ D) $-\dfrac{15}{8}, 0$

m50–8

95) _____

96) $3x^2 + 21x + 36 = 0$ 96) _____

    A) $-4, -3$ B) $-\dfrac{1}{2}, \dfrac{1}{2}$ C) $3, 4$ D) $7, 8$

97) $10x^3 + 70x^2 + 120x = 0$ 97) _____

    A) $0, -3, -4$ B) $-3, -4$ C) $0, 3, 4$ D) $-\dfrac{1}{3}, -4$

98) $9x^3 - 16x = 0$ 98) _____

    A) $\dfrac{4}{3}, -\dfrac{4}{3}, 0$ B) $\dfrac{4}{3}$ C) $-\dfrac{4}{3}$ D) $\dfrac{4}{3}, -\dfrac{4}{3}$

Find the product and simplify.

99) $\dfrac{z^3}{20z} \cdot \dfrac{5}{2z^2}$ 99) _____

    A) $\dfrac{1}{8}$ B) $\dfrac{1}{8z}$ C) $\dfrac{z}{8}$ D) $\dfrac{z^3}{8z^2}$

100) $\dfrac{2y}{4y + 2} \cdot \dfrac{10y + 5}{7}$ 100) _____

    A) $\dfrac{5y}{7}$ B) $\dfrac{5}{7}$ C) $\dfrac{5y}{14}$ D) $\dfrac{y}{7}$

Find the quotient and simplify.

101) $\dfrac{2x^{13}}{7x^6} \div \dfrac{4x}{14x^3}$ 101) _____

    A) x^9 B) $\dfrac{4x^5}{49}$ C) $\dfrac{2x^9}{7}$ D) $\dfrac{8x^5}{98}$

102) $\dfrac{x^2 - y^2}{x + y} \div \dfrac{x}{x^2 - xy}$ 102) _____

    A) $(x - y)^2$ B) $(x + y)$ C) $(x + y)^2$ D) $(x - y)(x + y)$

Perform the indicated operation. Simplify if possible.

103) $\dfrac{x^2 - 8x}{x - 6} + \dfrac{12}{x - 6}$

    A) x – 2   B) x + 6   C) x + 2   D) x – 6

103) _____

Graph the linear function.

104) $f(x) = -\dfrac{5}{6}x + 2$

104) _____

A)

B)

C)

D)

Match the linear function with its graph.

105) $f(x) = -3x + 9$

105) _____

A)

B)

C)
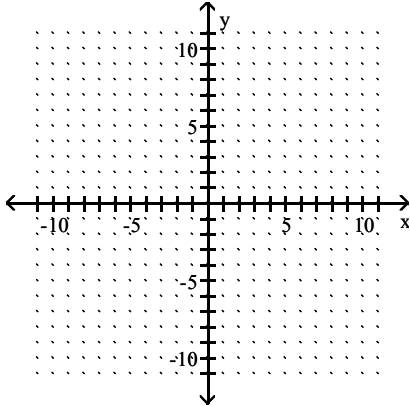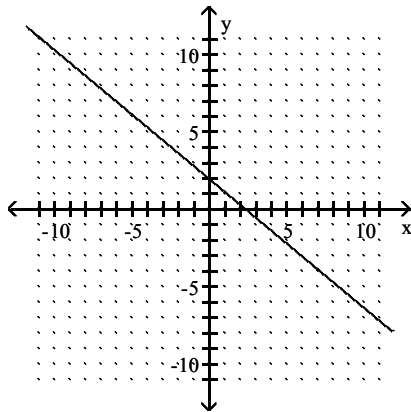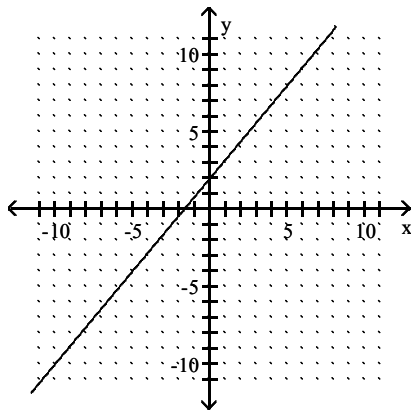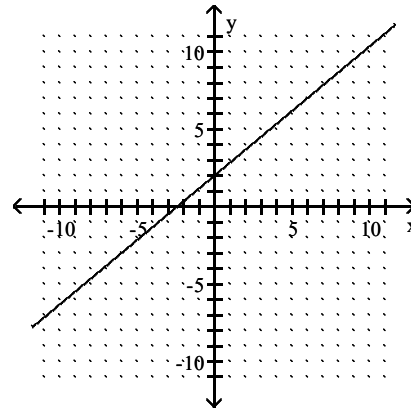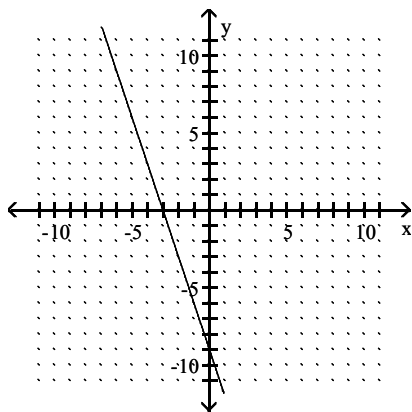
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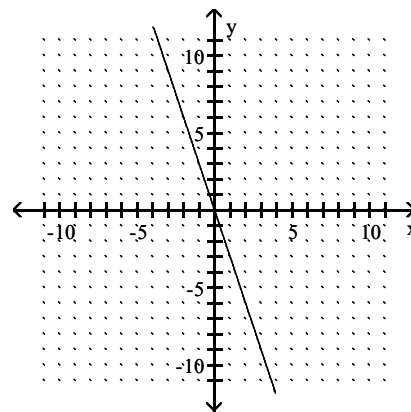
Objective: (15.1) Graph linear functions.

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

106) Through (8, 5); parallel to $f(x) = 5x - 6$

106) _____

A) $f(x) = 5x - 35$ B) $f(x) = 5x + 45$ C) $f(x) = 5x + 5$ D) $f(x) = -5x - 35$

Objective: (15.1) Find equations of parallel and perpendicular lines.

107) Through (2, 4); perpendicular to $f(x) = -3x + 4$

107) _____

A) $f(x) = \dfrac{1}{3}x + \dfrac{10}{3}$

B) $f(x) = -\dfrac{1}{3}x + \dfrac{10}{3}$

C) $f(x) = 3x + \dfrac{10}{3}$

D) $f(x) = -3x + \dfrac{10}{3}$

Objective: (15.1) Find equations of parallel and perpendicular lines.

Graph the function.

26

108) $f(x) = x^2 + 5$

108) _____

A)

B)

C)

D)
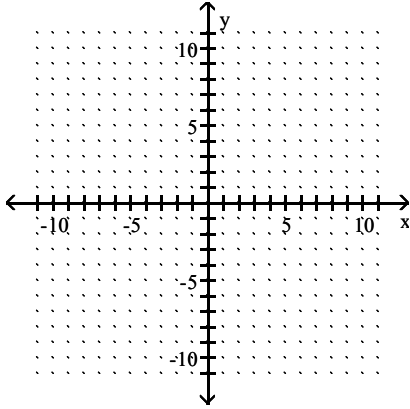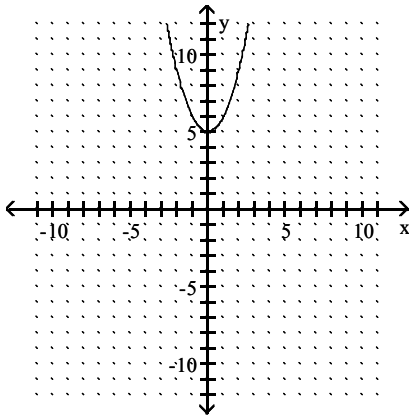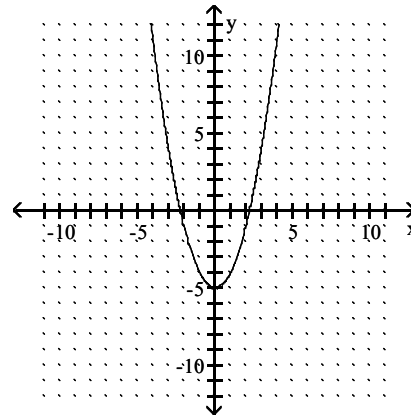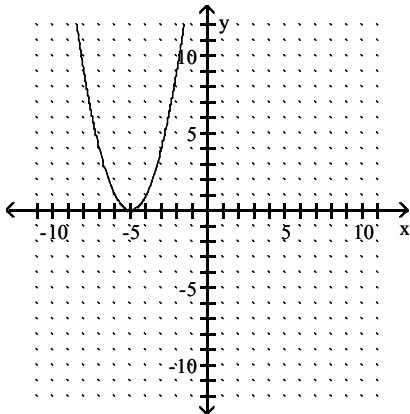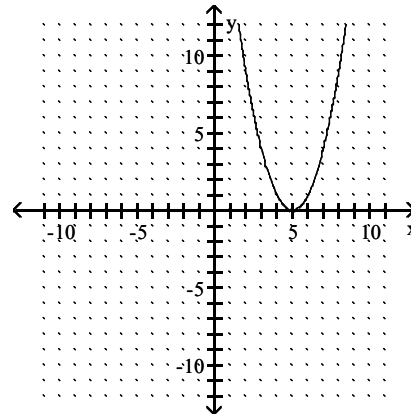
Objective: (15.2) Graph nonlinear functions.

109) $f(x) = \sqrt{x} + 5$ 109) _____

A)

B)

C)

D)
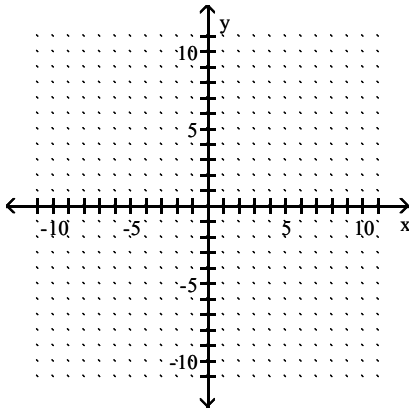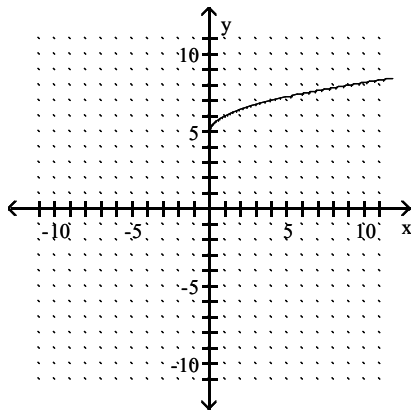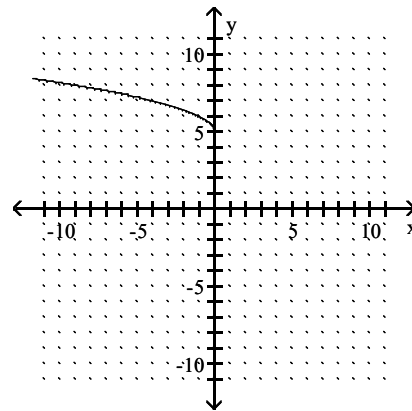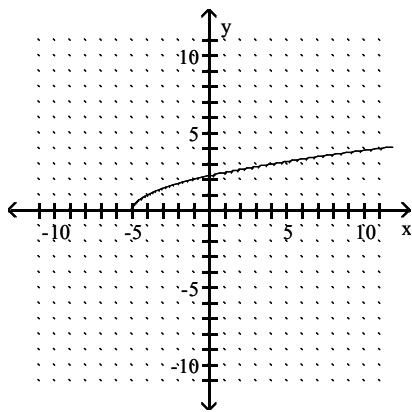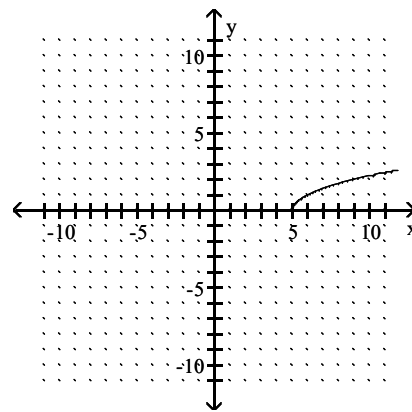
Objective: (15.2) Graph nonlinear functions.

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

110) _____

A)

B)

C)
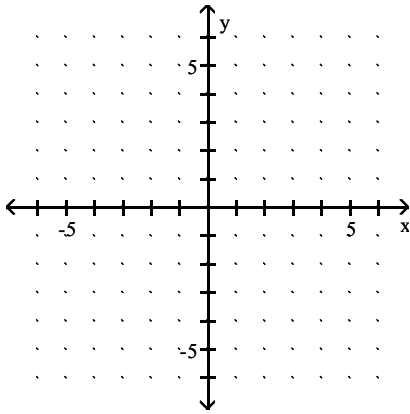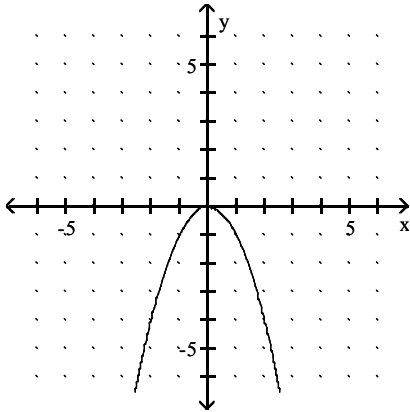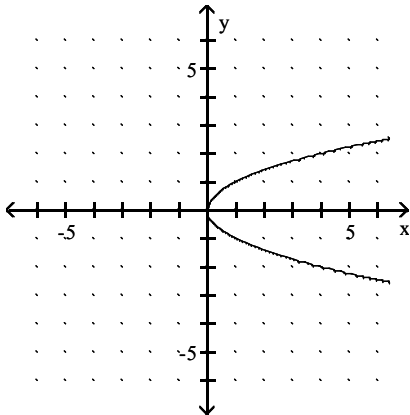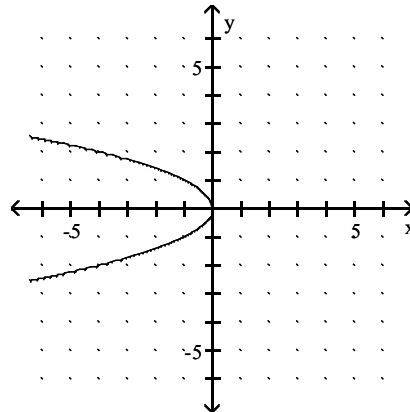
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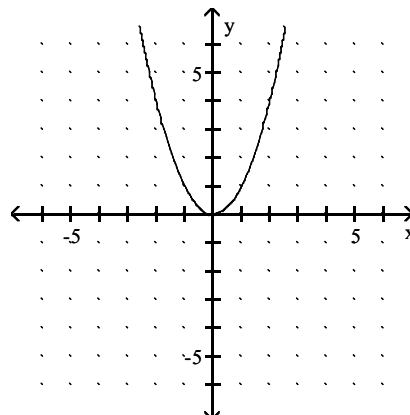
Objective: (15.3) Reflect graphs.

If y varies directly as x, find the direct variation equation for the situation.

111) $y = 3$ when $x = 21$

111) _____

A) $y = \dfrac{1}{7}x$ 　　　　　　B) $y = 7x$ 　　　　　　C) $y = x + 18$ 　　　　　　D) $y = \dfrac{1}{3}x$

Objective: (15.4) Solve problems involving direct variation.

29

Solve.

112) The amount of water used to take a shower is directly proportional to the amount of time that the shower is in use. A shower lasting 23 minutes requires 18.4 gallons of water. Find the amount of water used in a shower lasting 7 minutes.

    A) 5.6 gallons   B) 161 gallons   C) 4.8 gallons   D) 6.4 gallons

112) _____

Objective: (15.4) Solve problems involving direct variation.

Solve the compound inequality. Graph the solution set.

113) $13 \le 4t + 5 \le 29$

113) _____
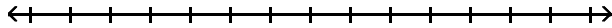
A) [2, 6]
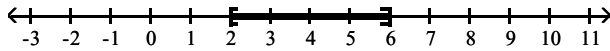
B) (2, 6)
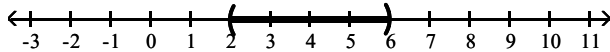
C) [−6, −2]
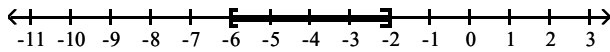
D) (−6, −2)
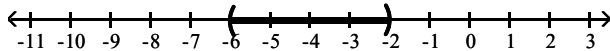
Objective: (16.1) Solve compound inequalities containing "and."
m50−20

Solve the absolute value equation.

114) $|x + 3| = 6$

    A) −9, 3   B) 9, 3   C) −3   D) ∅

114) _____

Objective: (16.2) Solve absolute value equations.
m50−21

Solve the inequality. Graph the solution set.

115) $|x + 18| < 9$

115) _____

A) (−27, −9)
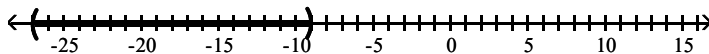
B) (9, 27)
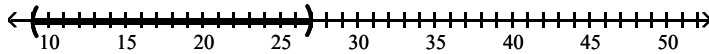
C) (−∞, −9)
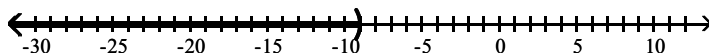
D) (−∞, −27)
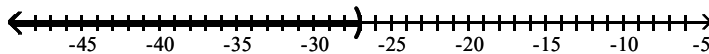
Objective: (16.3) Solve absolute value inequalities of the form |X| < a.
m50−22

116) $|x + 3| > 4$

    A) $(-\infty, -7) \cup (1, \infty)$

    B) $(-1, 7)$

    C) $(-7, 1)$

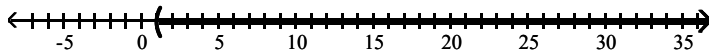
    D) $(1, \infty)$

116) _____
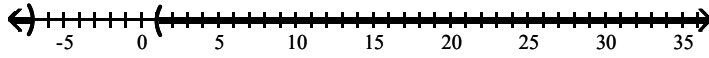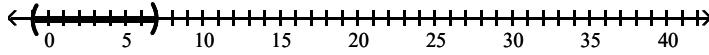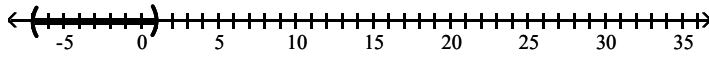
Objective: (16.3) Solve absolute value inequalities of the form $|X| > a$.
m50-23

Determine whether the ordered pair given is a solution of the linear inequality in two variables.

117) $2x + 3y \le -6$; $(3, 4)$

    A) Yes   B) No

117) _____

Objective: (16.4) Determine whether an ordered pair is a solution of a linear inequality in two variables.

118) $x + 2y > -3$; $(4, -3)$

    A) Yes   B) No

118) _____

Objective: (16.4) Determine whether an ordered pair is a solution of a linear inequality in two variables.

Graph the inequality.

119) $x + y \le -2$

119) _____
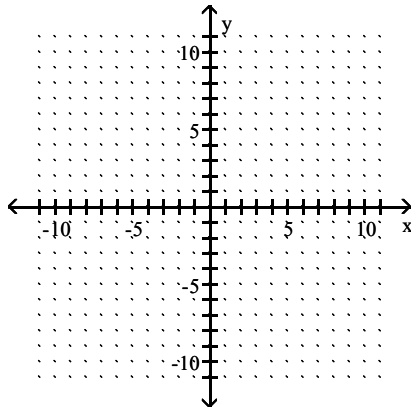
A)
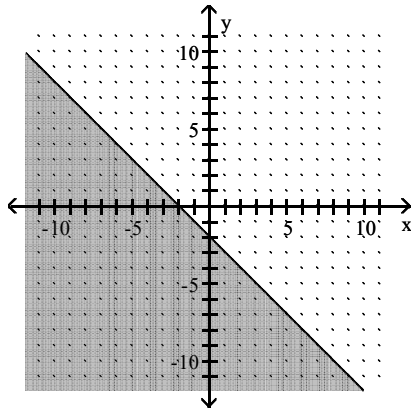
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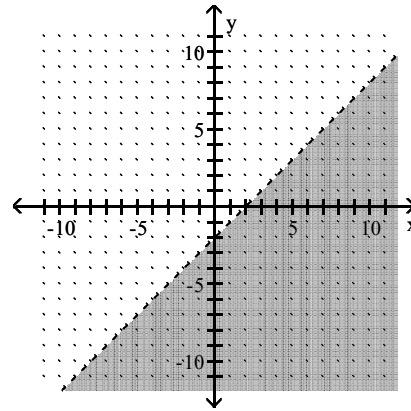
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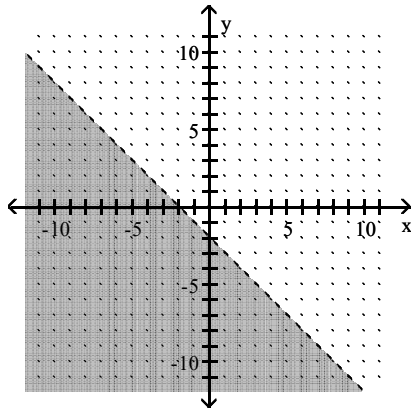
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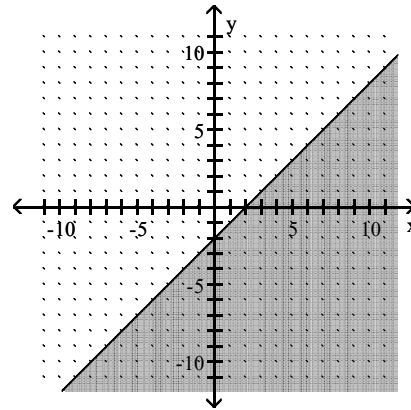
Objective: (16.4) Graph a linear inequality in two variables.

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

120) $\sqrt{16x^{10}}$ 120) _____

    A) $4x^5$ B) $4x^{10}$ C) $16x^5$ D) $4x^2$

Objective: (17.1) Find square roots.
m50–24

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

121) $256^{1/4}$ 121) _____

    A) 4   B) 16   C) 64   D) 1024

Objective: (17.2) Understand the meaning of a^(1/n).
m50–27

122) $(243x^{25})^{1/5}$ 122) _____

    A) $3x^5$ B) $243x^5$ C) $3x^{25}$ D) $3\sqrt[5]{x}$

Objective: (17.2) Understand the meaning of a^(1/n).

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

123) $\sqrt{20}$ 123) _____

    A) $2\sqrt{5}$ B) $5\sqrt{2}$ C) 10   D) 4

Objective: (17.3) Simplify radicals.

124) $\sqrt{275}$

    A) $5\sqrt{11}$ B) $\sqrt{275}$ C) 55   D) $25\sqrt{11}$

Objective: (17.3) Simplify radicals.

125) $\sqrt{320k^7q^8}$

    A) $8k^3q^4\sqrt{5k}$ B) $8k^7q^8\sqrt{5k}$ C) $8k^3q^4\sqrt{5}$ D) $8q^4\sqrt{5k^7}$

Objective: (17.3) Simplify radicals.

126) $\sqrt[3]{512x^4y^5}$

    A) $8xy\sqrt[3]{xy^2}$ B) $5xy\sqrt[3]{xy^2}$ C) $8xy\sqrt[3]{xy}$ D) $8xy\sqrt{xy^2}$

Objective: (17.3) Simplify radicals.
m50–30

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

127) $\sqrt{20} - \sqrt{245}$

    A) $-5\sqrt{5}$ B) $9\sqrt{5}$ C) -25 D) $-5\sqrt{10}$

Objective: (17.4) Add or subtract radical expressions.

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

128) $\dfrac{\sqrt{5} - \sqrt{6}}{\sqrt{5} + \sqrt{6}}$

    A) $2\sqrt{30} - 11$ B) $11 - 2\sqrt{30}$ C) $11 + 2\sqrt{30}$ D) $-11 - 2\sqrt{30}$

Objective: (17.5) Rationalize denominators having two terms.

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

129) $\dfrac{5 + \sqrt{6}}{5 - \sqrt{6}}$

    A) $\dfrac{19}{31 - 10\sqrt{6}}$ B) $\dfrac{19}{31 + 10\sqrt{6}}$ C) 1 D) $\dfrac{31}{19 - 10\sqrt{6}}$

Objective: (17.5) Rationalize numerators.

Solve.

130) $\sqrt{x + 4} = 8$

    A) 60   B) 64   C) 68   D) 144

Objective: (17.6) Solve equations that contain radical expressions.
m50–33

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

131) $\dfrac{8 + 7i}{9 - 2i}$

    A) $\dfrac{58}{85} + \dfrac{79}{85}i$ B) $\dfrac{58}{77} - \dfrac{79}{77}i$ C) $\dfrac{86}{85} - \dfrac{47}{85}i$ D) $\dfrac{86}{77} - \dfrac{79}{77}i$

Objective: (17.7) Divide complex numbers.
m50–37

Use the square root property to solve the equation.

132) $(x - 5)^2 = 36$

    A) 11, –1   B) –1, –11   C) 6, –6   D) 41

132) _____

Solve the equation by completing the square.

133) $x^2 + 4x - 21 = 0$

    A) 3, –7   B) –3, 7   C) $\sqrt{5}$, –1   D) –14, –7

133) _____

Use the quadratic formula to solve the equation.

134) $x^2 - 2x - 48 = 0$

    A) – 6, 8   B) 6, –8   C) 6, 8   D) –48, 0

134) _____

135) $x^2 + 24x + 144 = 0$

    A) –12, 12   B) –12   C) 12 – i, 12 + i   D) 12

135) _____

136) $x^2 + 18x + 70 = 0$

    A) $-9 - \sqrt{11}, -9 + \sqrt{11}$ B) $9 + \sqrt{11}$

    C) $9 - \sqrt{70}, 9 + \sqrt{70}$ D) $-18 + \sqrt{70}$

136) _____

137) $x^2 - 8x + 20 = 0$

    A) 4 – 2i, 4 + 2i   B) 4 – 4i, 4 + 4i   C) 4 + 2i   D) 6, 2

137) _____

138) $2x^2 - 7x - 9 = 0$

    A) $\frac{2}{9}$, 1   B) $\frac{9}{2}$, –1   C) $\frac{2}{9}$, 0   D) $\frac{2}{9}$, –1

138) _____

139) $5x^2 + 12x = -6$

    A) $\frac{-6 - \sqrt{6}}{5}, \frac{-6 + \sqrt{6}}{5}$ B) $\frac{-6 - \sqrt{6}}{10}, \frac{-6 + \sqrt{6}}{10}$

    C) $\frac{-12 - \sqrt{6}}{5}, \frac{-12 + \sqrt{6}}{5}$ D) $\frac{-6 - \sqrt{66}}{5}, \frac{-6 + \sqrt{66}}{5}$

139) _____

Sketch the graph of the quadratic function. Give the vertex and axis of symmetry.

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

140) _____
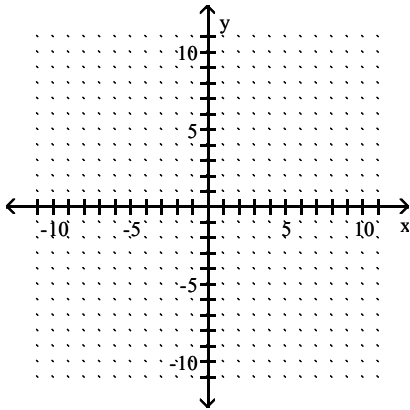
A) vertex $(0, -4)$; axis $x = 0$
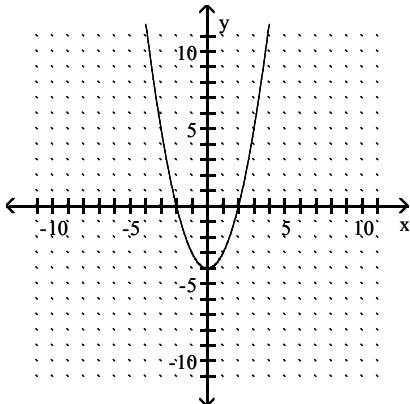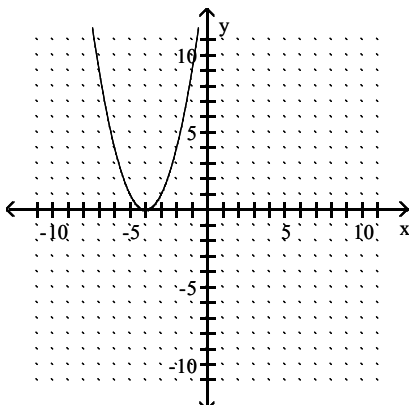
B) vertex $(4, 0)$; axis $x = 4$

C) vertex $(-4, 0)$; axis $x = -4$
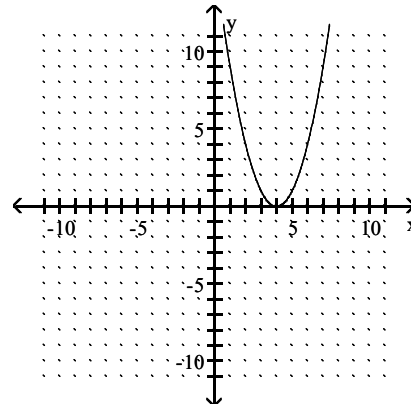
D) vertex $(0, 4)$; axis $x = 0$
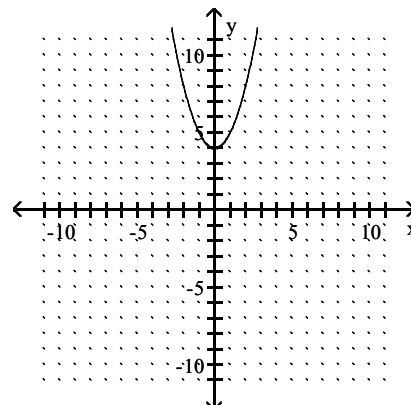
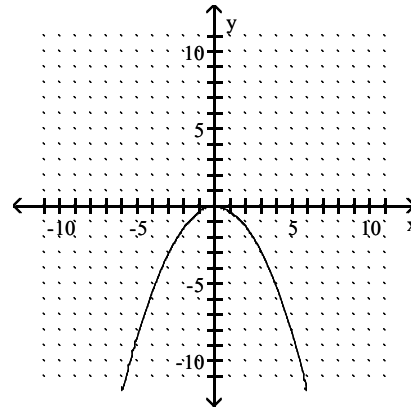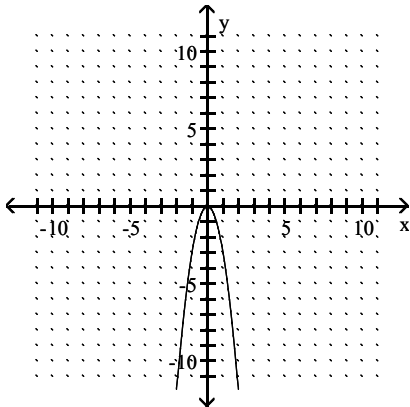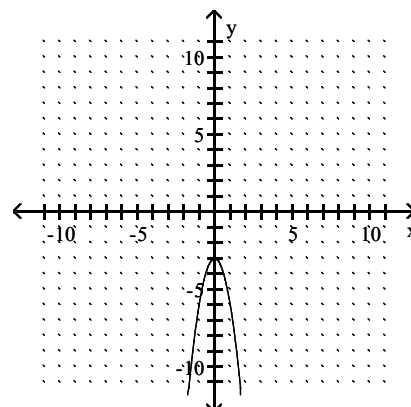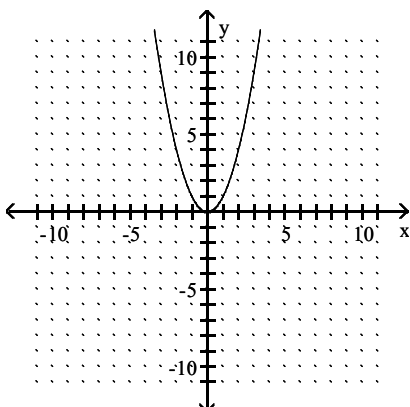Objective: (18.5) Graph quadratic functions of the form $f(x) = x^2 + k$.
m50–44

141) $f(x) = (x + 5)^2$

141) _____
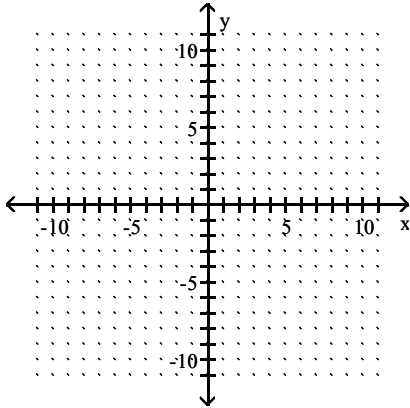
A) vertex (–5, 0); axis x = –5
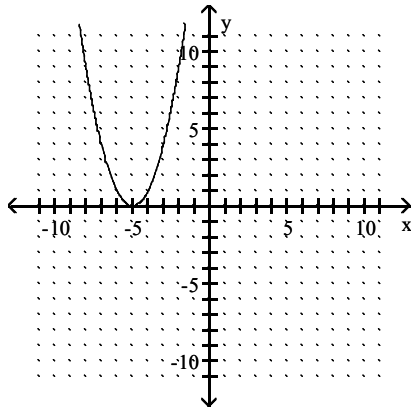
B) vertex (5, 0); axis x = 5

C) vertex (0, 5); axis x = 0
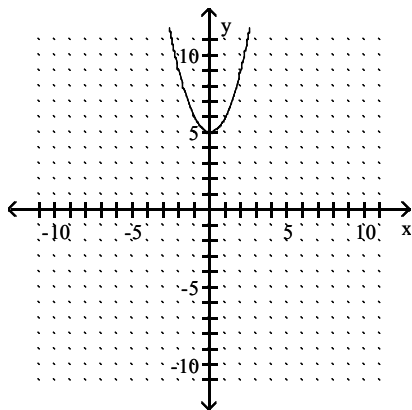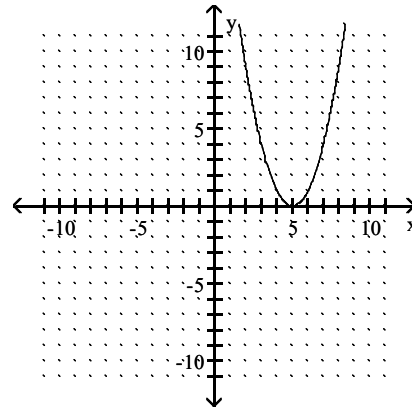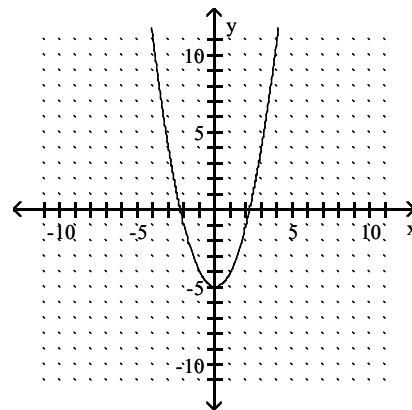
D) vertex (0, –5); axis x = 0

Objective: (18.5) Graph quadratic functions of the form $f(x) = (x - h)^2$.

142) $f(x) = (x + 6)^2 + 4$

142) _____
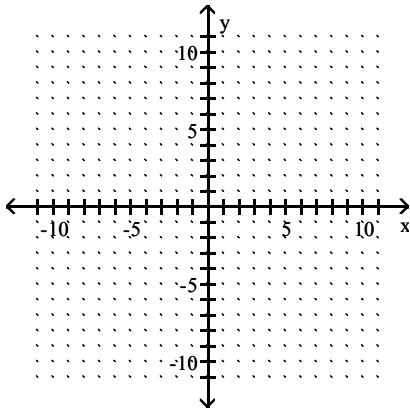
A) vertex (−6, 4); axis x = −6
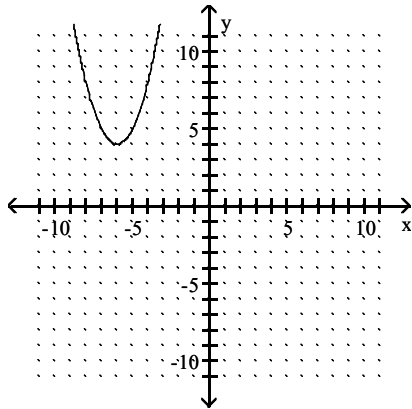
B) vertex (6, 4); axis x = 6

C) vertex (−4, 6); axis x = −4
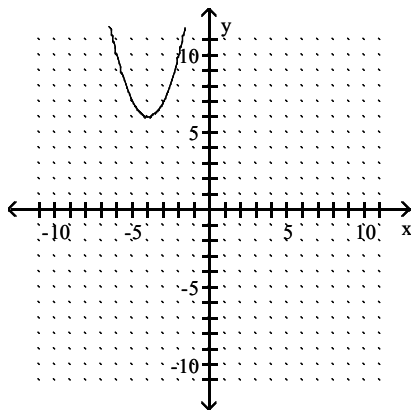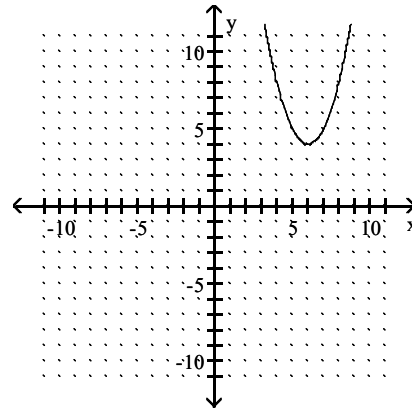
D) vertex (4, −6); axis x = 4
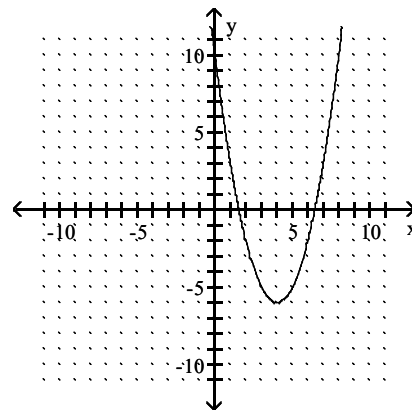
Objective: (18.5) Graph quadratic functions of the form f(x) = (x − h)^2 + k.

143) $f(x) = -3x^2$ 143) _____
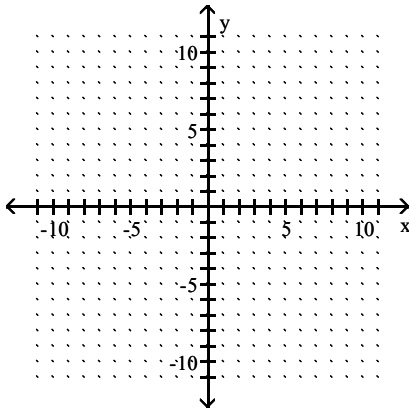
A) vertex (0, 0); axis $x = 0$ B) vertex (0, 0); axis $x = 0$

C) vertex (0, 0); axis $x = 0$ D) vertex (0, –3); axis $x = 0$

Objective: (18.5) Graph quadratic functions of the form $f(x) = ax^2$.

Find the vertex of the graph of the quadratic function.

144) $f(x) = x^2 + 6x - 4$ 144) _____

   A) (–3, –13)   B) (3, 23)   C) (6, 68)   D) (–3, –31)

Objective: (18.6) Find the vertex of the graph of a quadratic function.

145) $f(x) = -x^2 - 10x + 9$ 145) _____

   A) (–5, 34)   B) (5, –66)   C) (–10, 9)   D) (5, –16)

Objective: (18.6) Find the vertex of the graph of a quadratic function.

146) $f(x) = 7x^2 + 14x - 9$

    A) (−1, −16)   B) (1, 12)   C) (−2, 5)   D) (2, 47)

146) _____

Objective: (18.6) Find the vertex of the graph of a quadratic function.
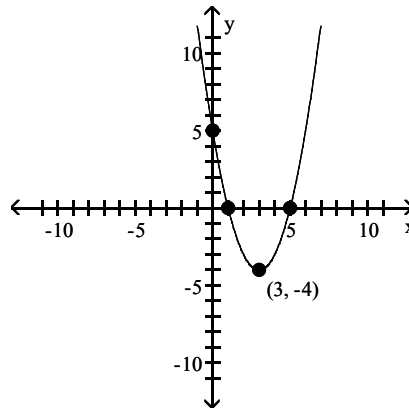
Match the function with its graph.

147) $f(x) = x^2 + 4x - 5$
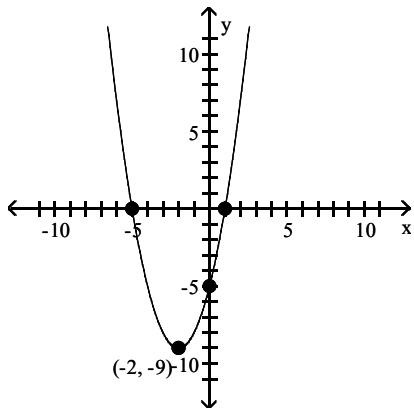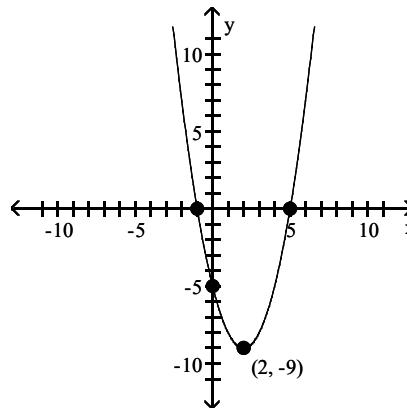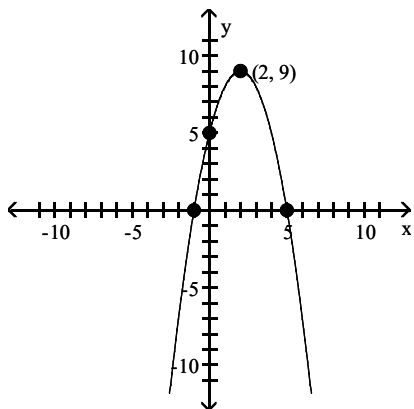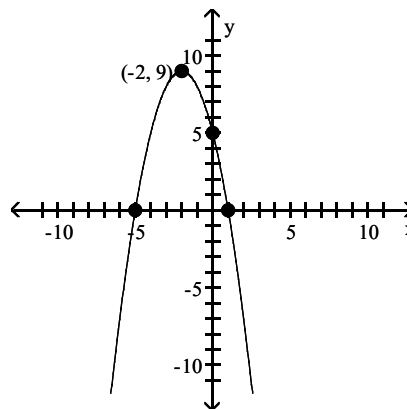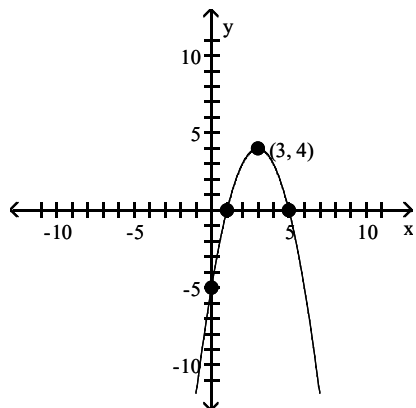
147) _____

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.
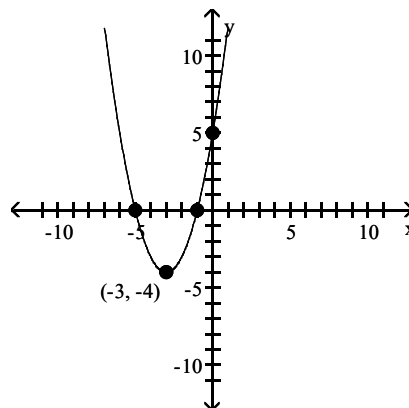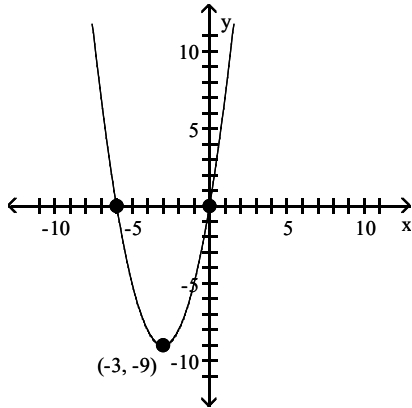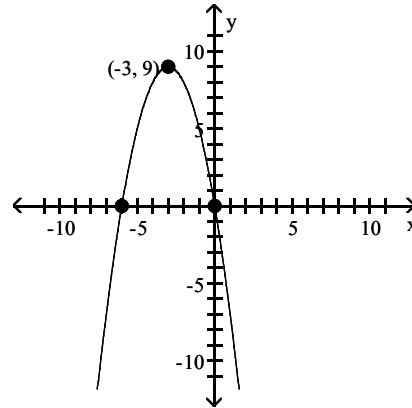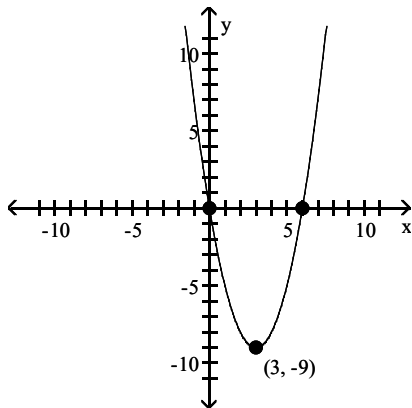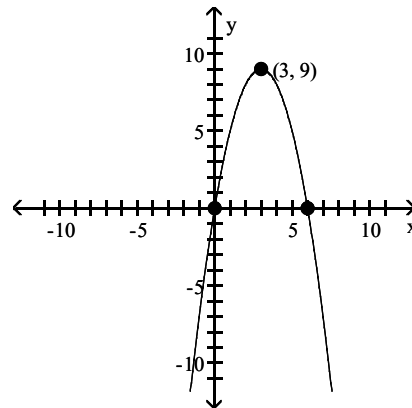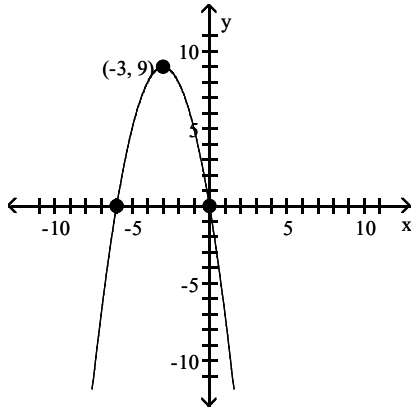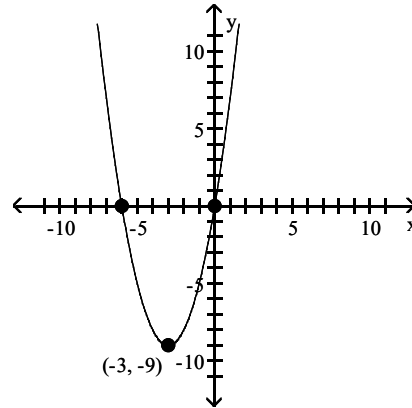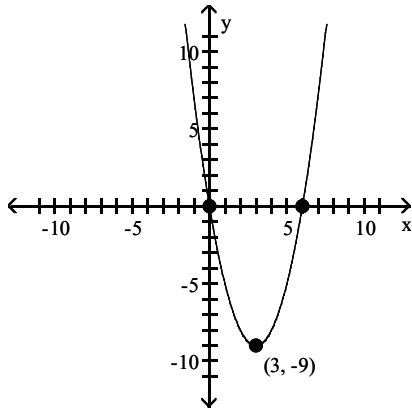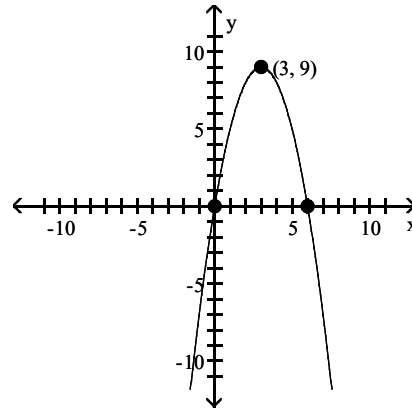
148) $f(x) = x^2 + 6x + 5$

148) _____
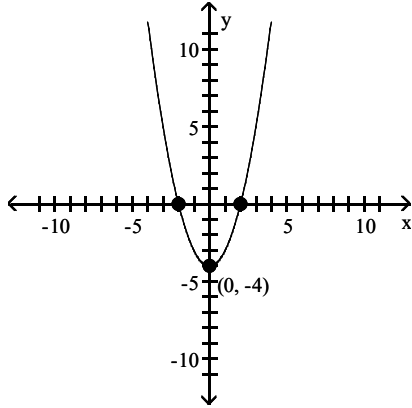
A)
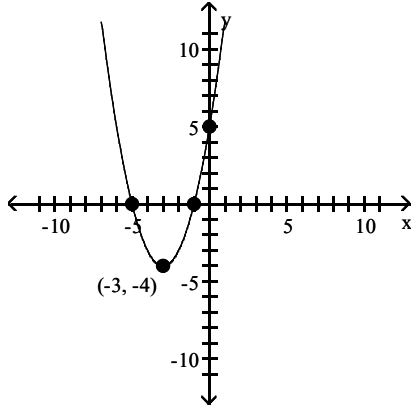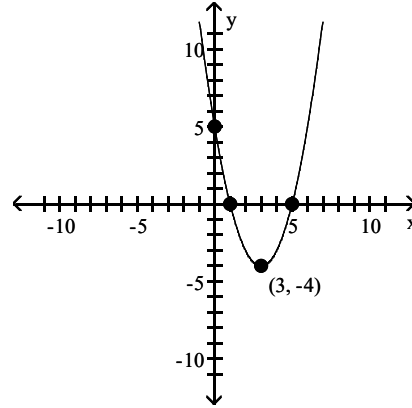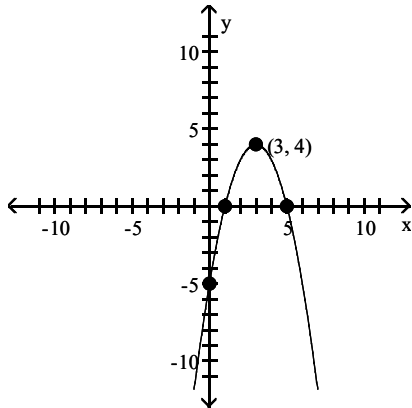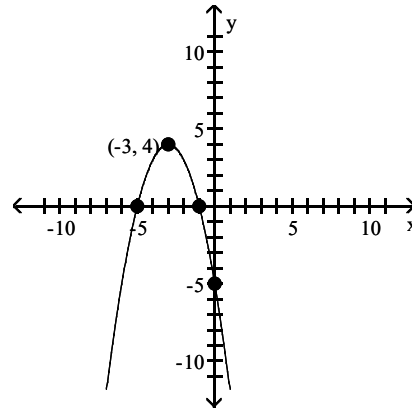
(-3, -4)

B)

(3, -4)

C)

(3, 4)

D)

(-3, 4)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

149) $f(x) = -x^2 - 6x - 5$
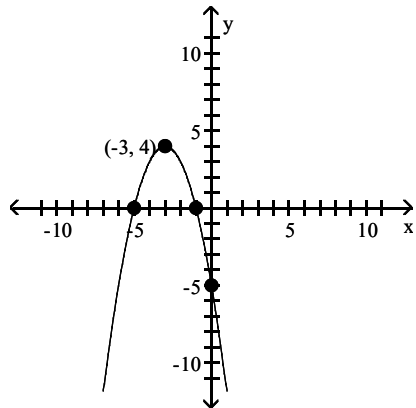
A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

149) _____

150) $f(x) = x^2 + 6x$ 150) _____

A)

B)

C)

D)

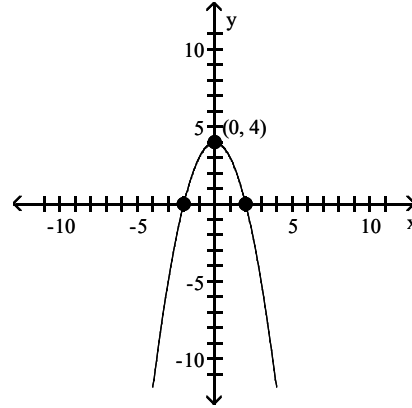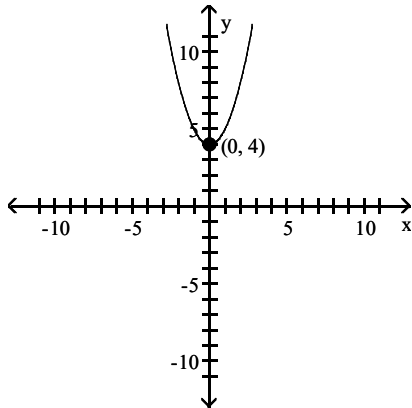Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

42

151) $f(x) = -x^2 - 6x$ 151) _____
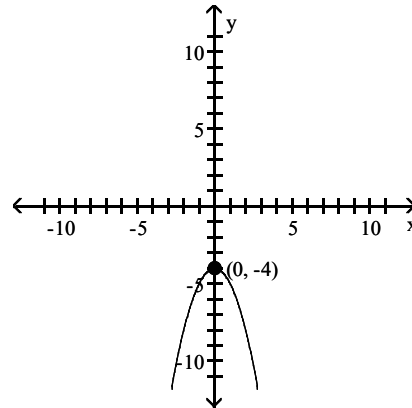
A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

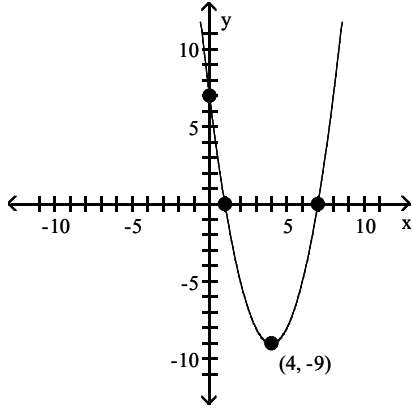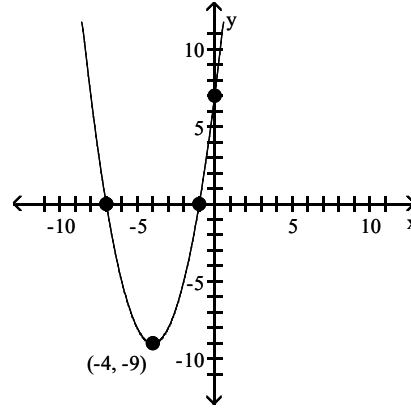152) $f(x) = x^2 - 4$ 152) _____

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

153) $f(x) = x^2 - 8x + 7$
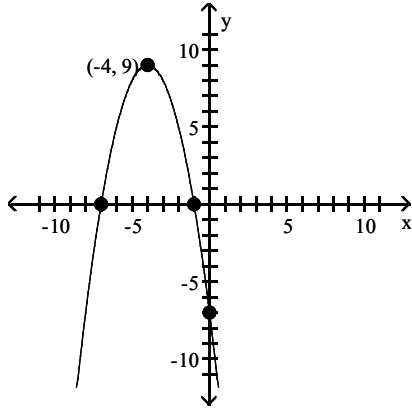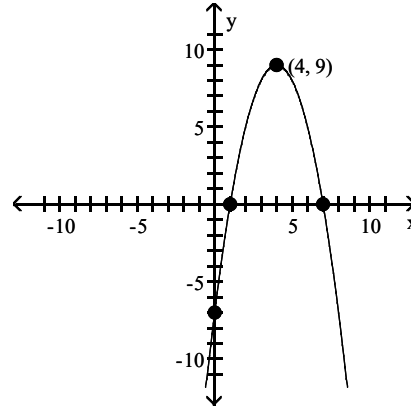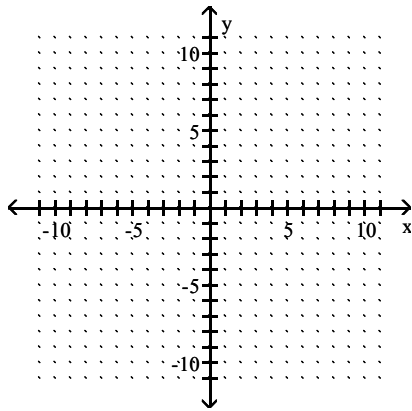
153) _____

A)

B)

C)

D)

Objective: (18.6) Graph a quadratic function and find the vertex, intercepts, and direction of opening.

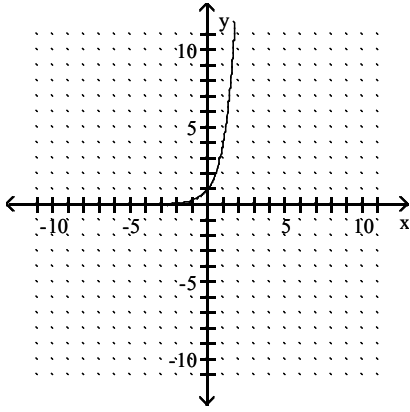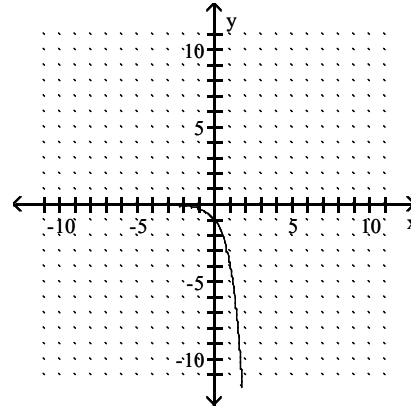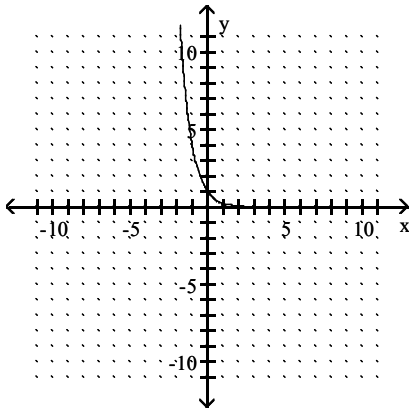**Graph the exponential function.**

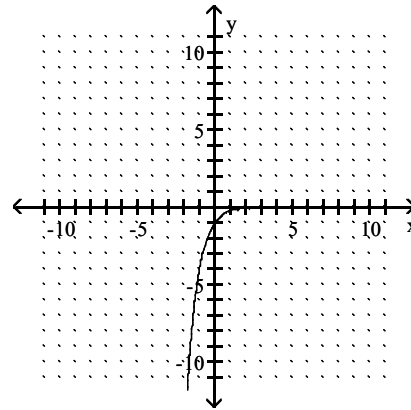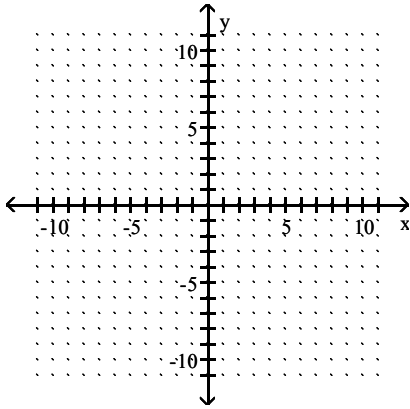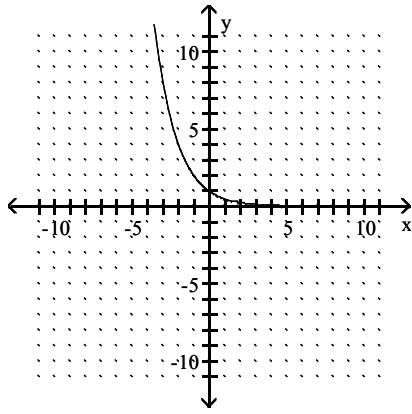154) $f(x) = 4^x$

154) _____

A)

B)

C)

D)

Objective: (19.3) Graph exponential functions.

155) $f(x) = \left(\frac{1}{2}\right)^x$

155) _____

46

A)

B)

C)

D)

Objective: (19.3) Graph exponential functions.

The graph of an exponential function is given. Match the graph to one of the following functions.

156)

156) _____

A) $f(x) = 4^x$ B) $f(x) = 4^{x + 2}$ C) $f(x) = 4^x + 2$ D) $f(x) = 4^x - 2$

Objective: (19.3) Graph exponential functions.

157)

A) $f(x) = \left(\dfrac{1}{5}\right)^x$ B) $f(x) = 5^x$ C) $f(x) = -5^x$ D) $f(x) = -\left(\dfrac{1}{5}\right)^x$

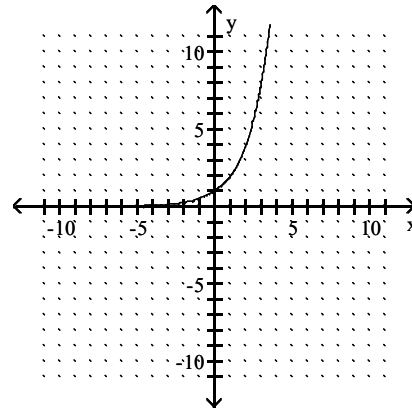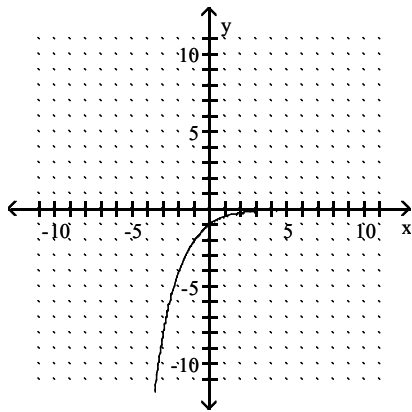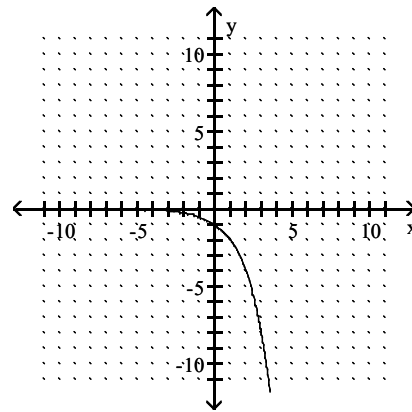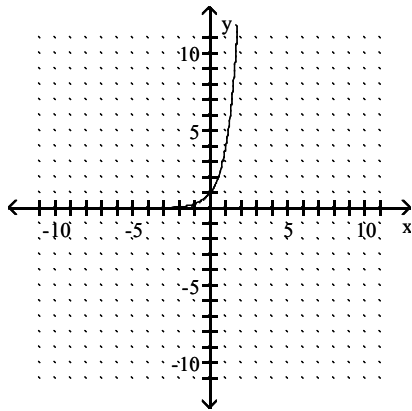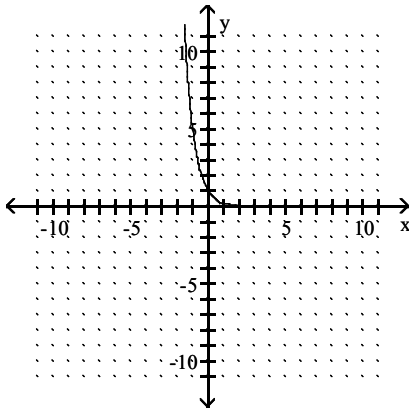157) _____

Objective: (19.3) Graph exponential functions.

Solve.

158) Four bacteria are placed in a petri dish. The population will triple every day. The formula for the number of bacteria in the dish on day t is $N(t) = 4(3)^t$, where t is the number of days after the four bacteria are placed in the dish. How many bacteria are in the dish five days after the four bacteria are placed in the dish?

158) _____

    A) 972 bacteria   B) 60 bacteria   C) 500 bacteria   D) 12 bacteria

Objective: (19.3) Solve problems modeled by exponential equations.

Write the first five terms of the sequence whose general term is given.

159) $a_n = n - 4$

159) _____

    A) –3, –2, –1, 0, 1   B) –4, –3, –2, –1, 0
    C) –1, 0, 1, 2, 3   D) –16, –12, –8, –4, 0

Objective: (21.1) Write the terms of a sequence given its general term.

160) $a_n = n^2 - n$

160) _____

    A) 0, 2, 6, 12, 20   B) 2, 6, 12, 20, 30   C) 1, 4, 9, 16, 25   D) 0, 3, 8, 15, 24

Objective: (21.1) Write the terms of a sequence given its general term.

161) $a_n = 2n - 2$

161) _____

    A) 0, 2, 4, 6, 8   B) 0, 1, 2, 3, 4   C) 4, 6, 8, 10, 12   D) 0, –2, –4, –6, –8

Objective: (21.1) Write the terms of a sequence given its general term.

1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) D
10) C
11) A
12) A
13) A
14) A
15) A
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23) A
24) A
25) A
26) A
27) A
28) A
29) A
30) A
31) C
32) B
33) C
34) A
35) A
36) A
37) A
38) A
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44) A
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160) A
161) A