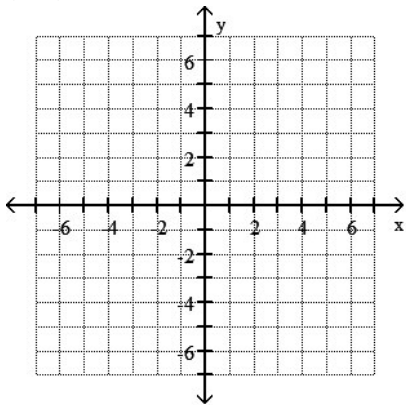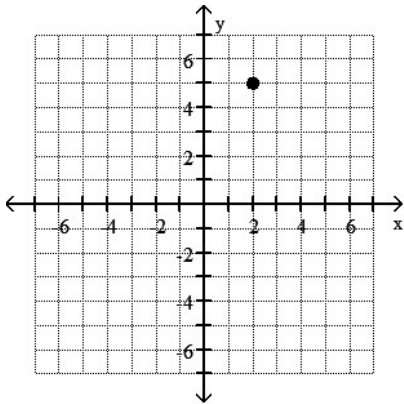**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

Plot the given point in a rectangular coordinate system.
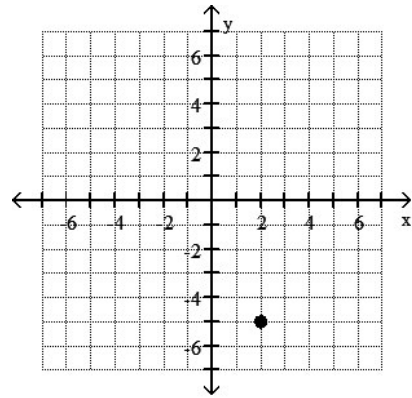
1) (2, 5)

A)

B)

C)

D)

Objective: (1) Plot Points in the Rectangular Coordinate System

2) (–2, 5)

A)

B)

C)

D)

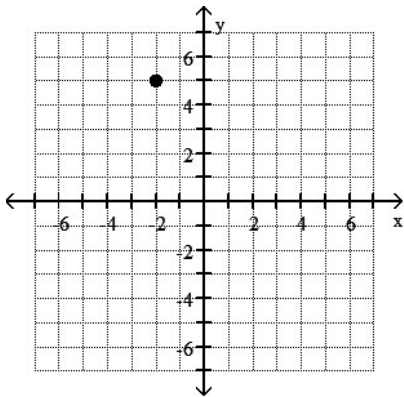Objective: (1) Plot Points in the Rectangular Coordinate System

3) (4, –5)

2

A)

B)

C)

D)
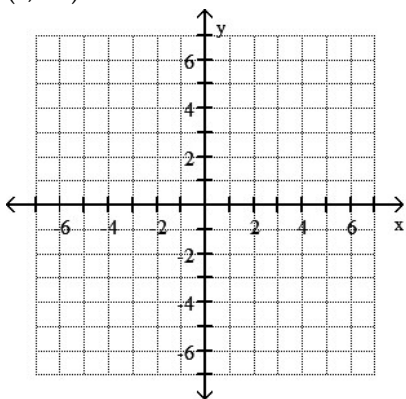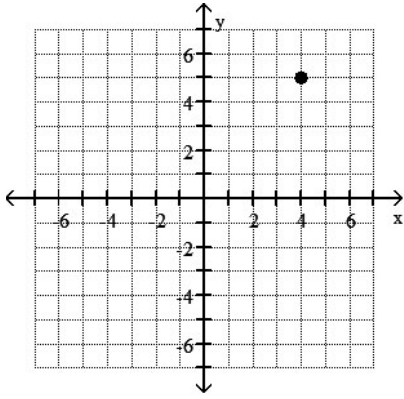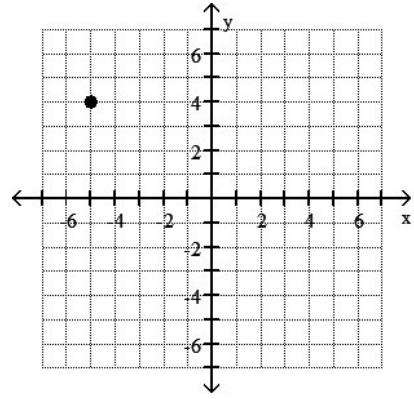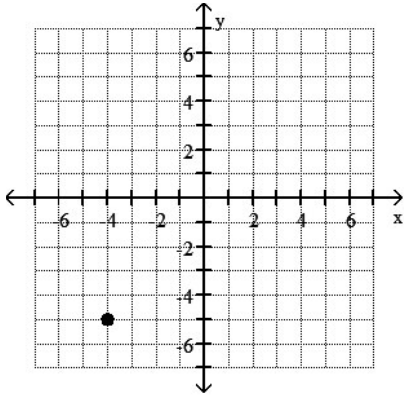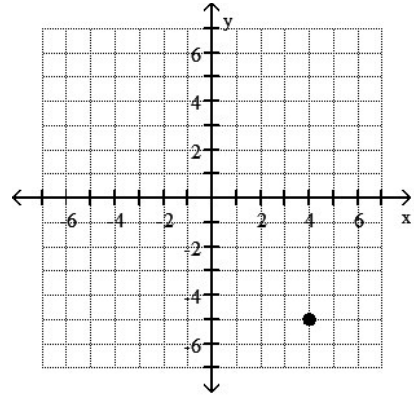
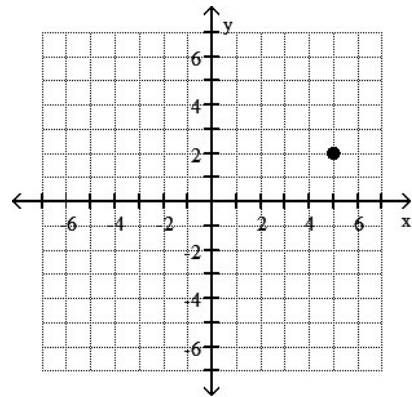Objective: (1) Plot Points in the Rectangular Coordinate System

4) (−5, −4)

A)

B)

C)

D)
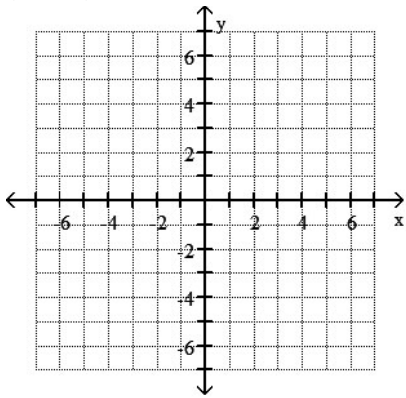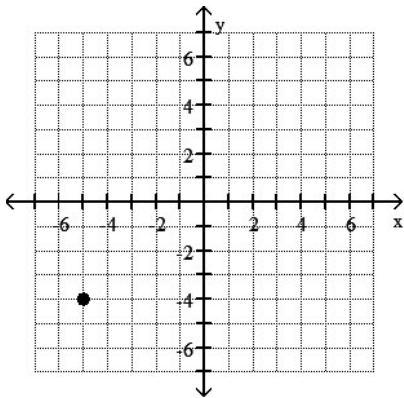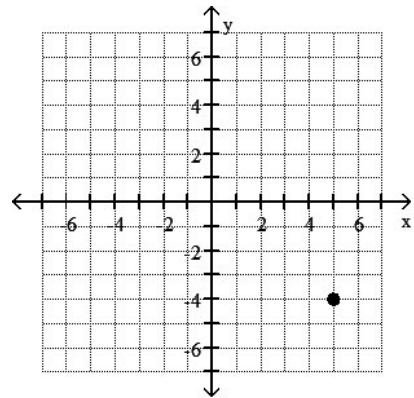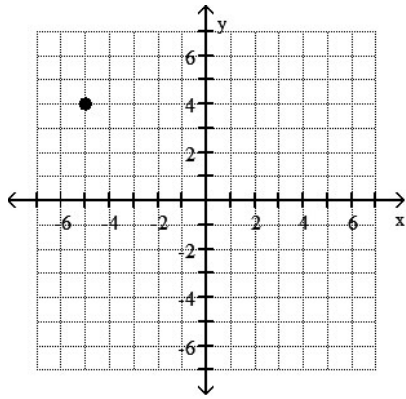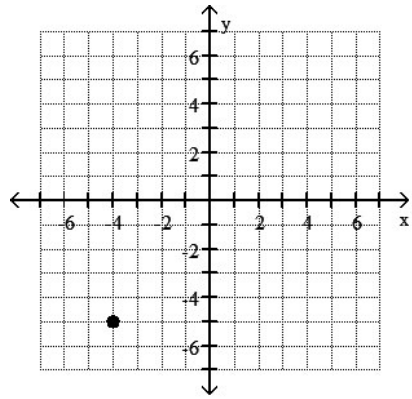
Objective: (1) Plot Points in the Rectangular Coordinate System

5) (0, 6)
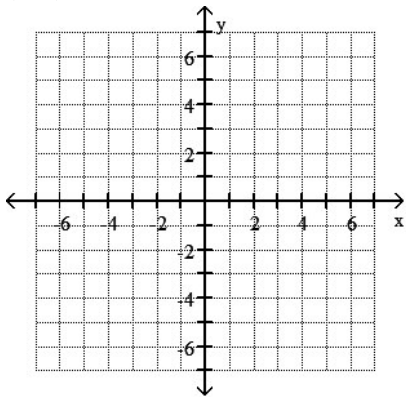
A)
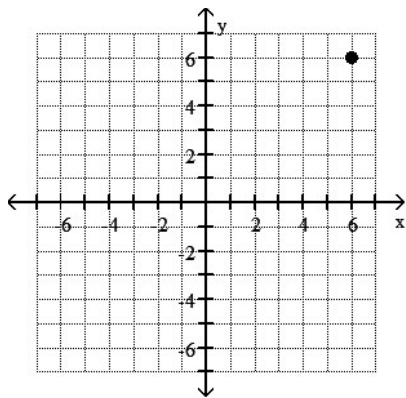
B)
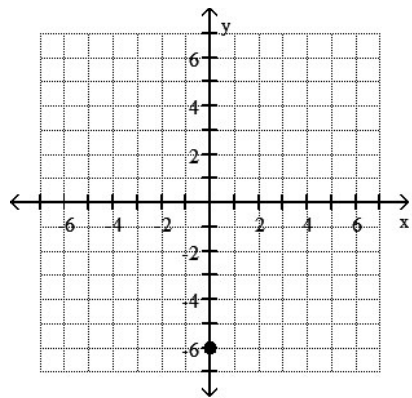
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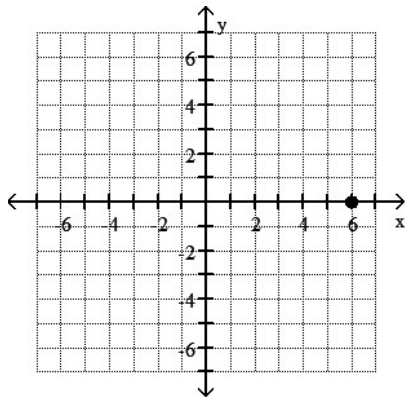
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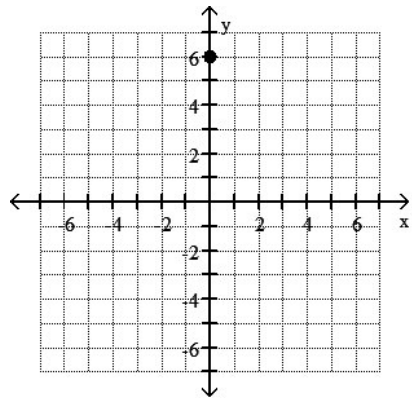
4

6) (1, 0)

A)

B)

C)
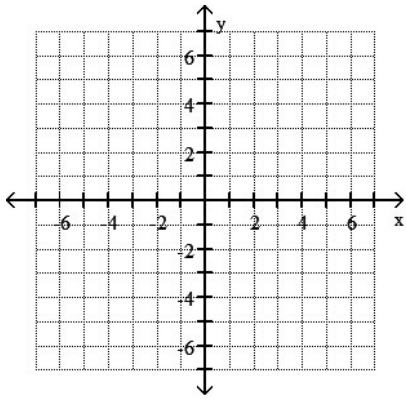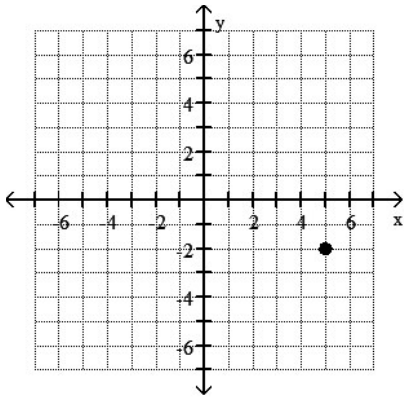
D)
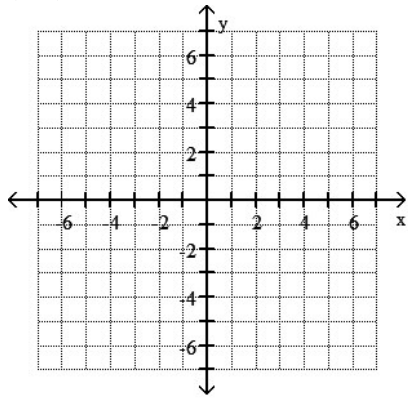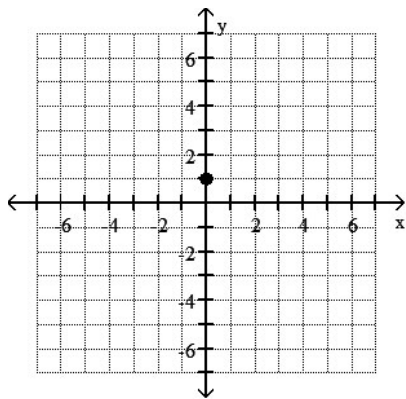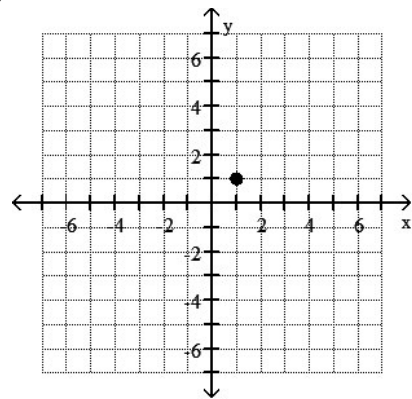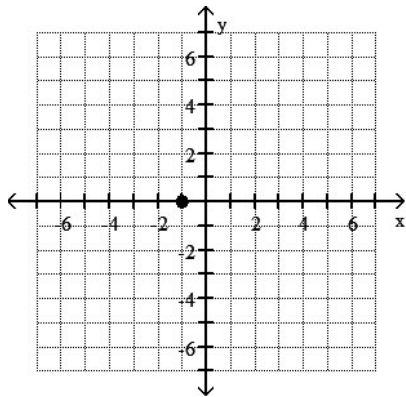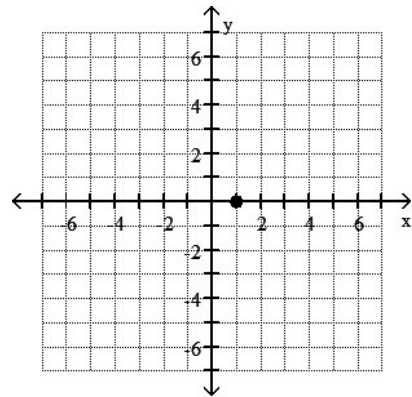
7) $\left(-\frac{7}{2}, -\frac{11}{2} \right)$

A)

B)

C)

D)
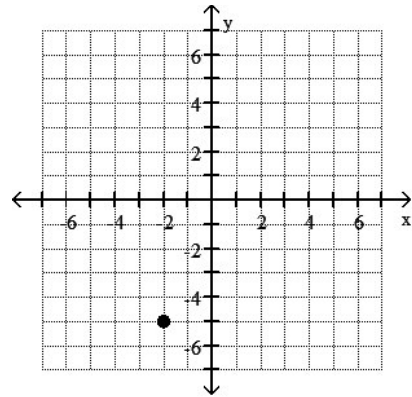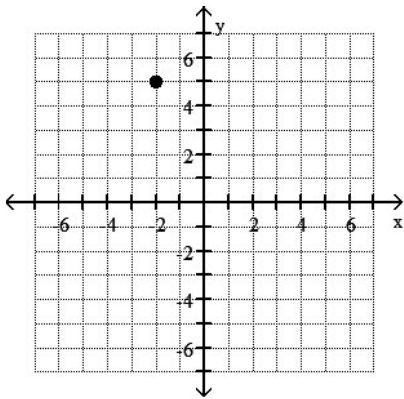
Objective: (1) Plot Points in the Rectangular Coordinate System
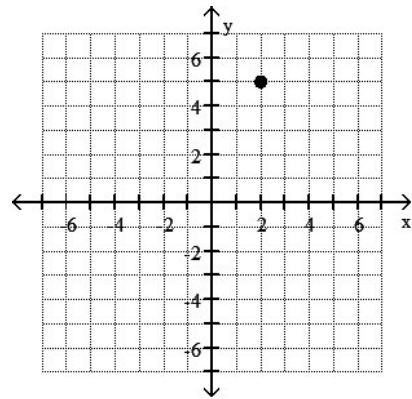
8) $\left(-\dfrac{11}{2}, 0\right)$

A)

B)

C)

D)
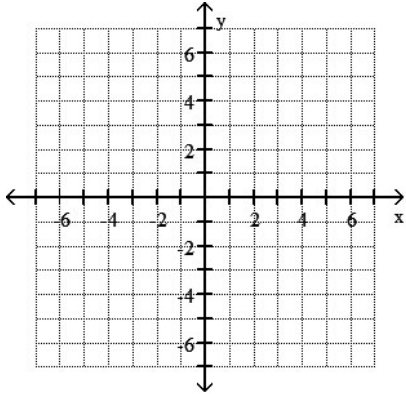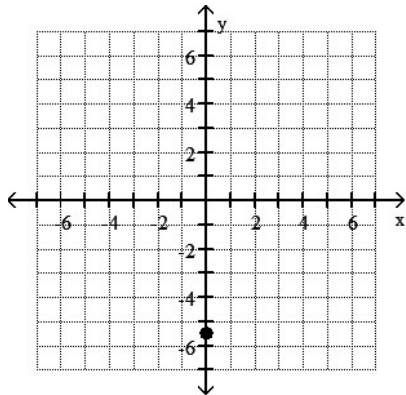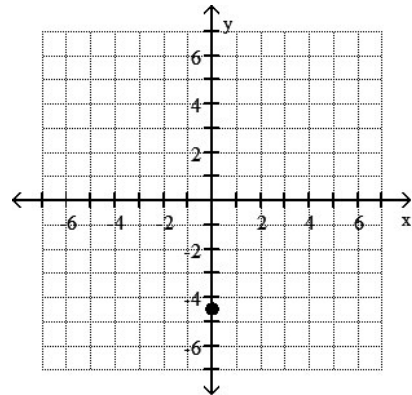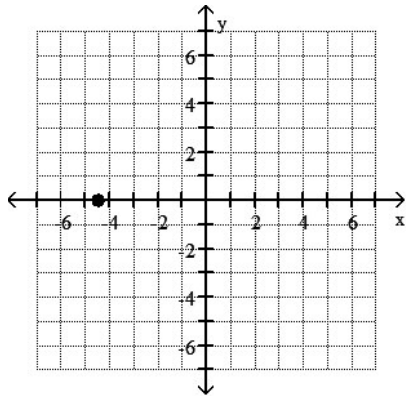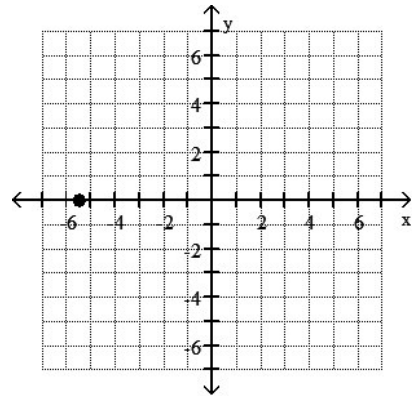
Objective: (1) Plot Points in the Rectangular Coordinate System

Graph the equation.

9) y = x + 4

A)

B)

C)

D)
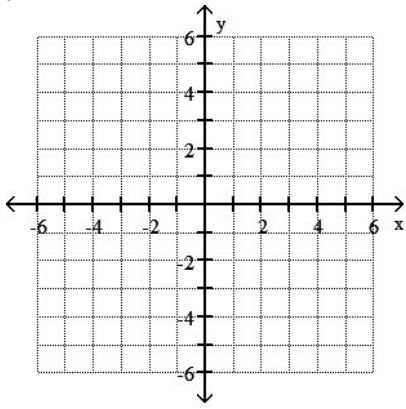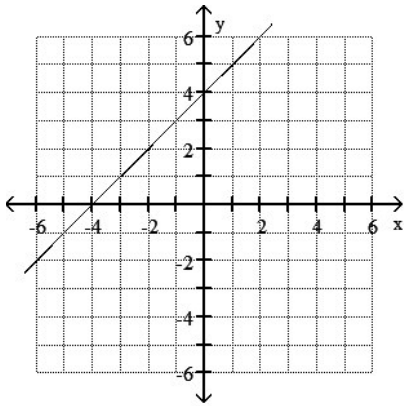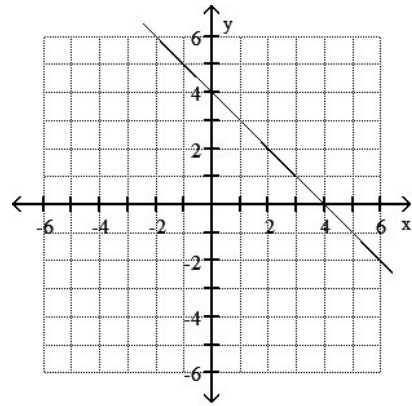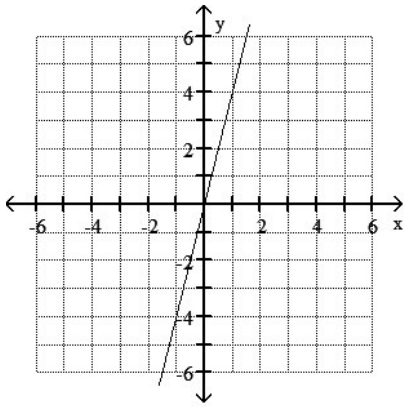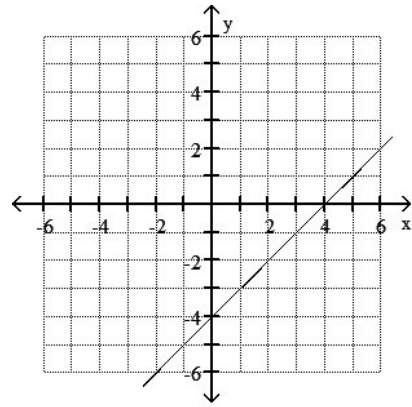
Objective: (2) Graph Equations in the Rectangular Coordinate System

10) y = 3x – 2

A)

B)

C)

D)

Objective: (2) Graph Equations in the Rectangular Coordinate System

9
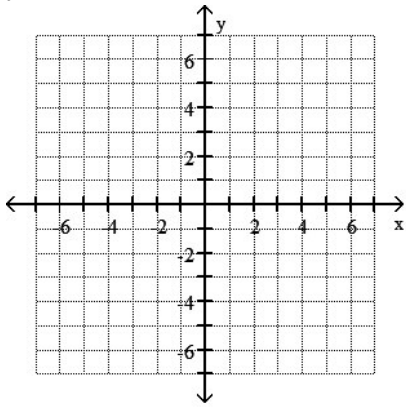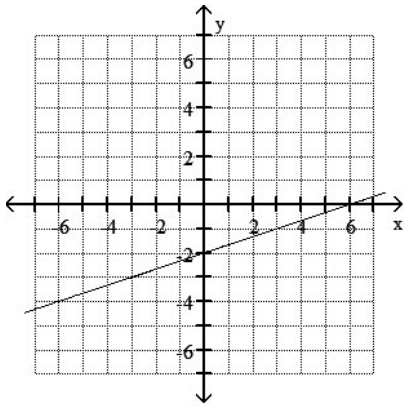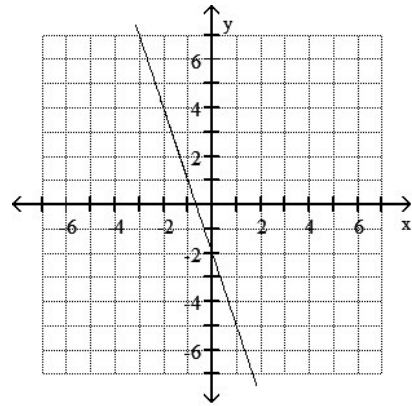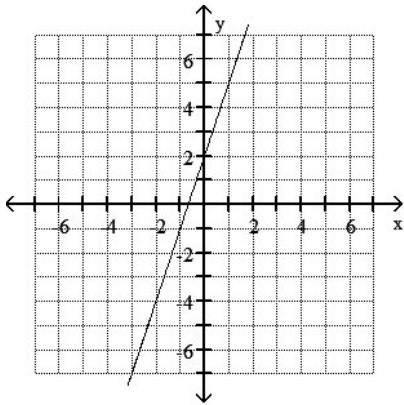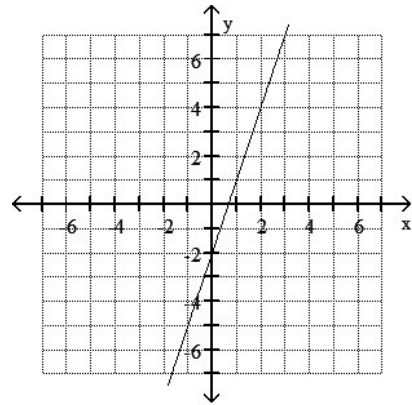
11) $y = -\dfrac{1}{3}x - 5$

A)

B)

C)

D)
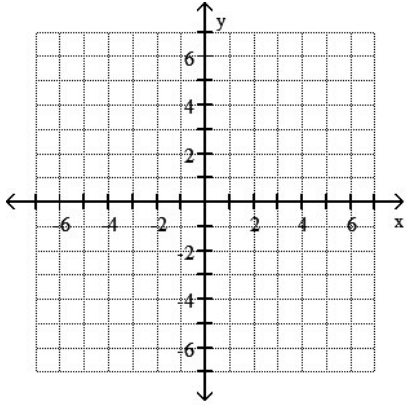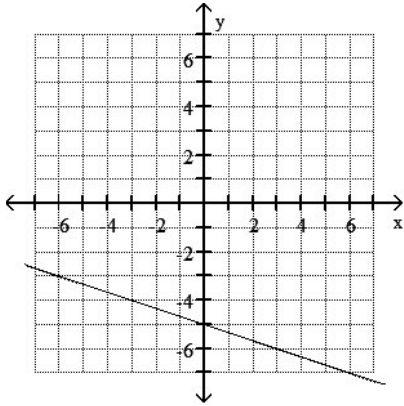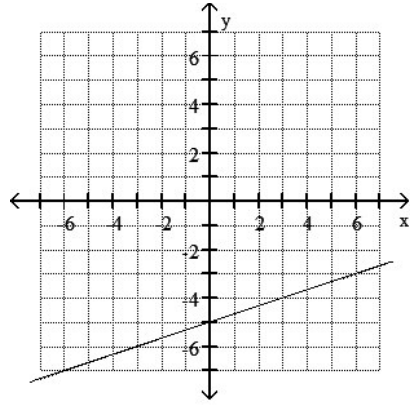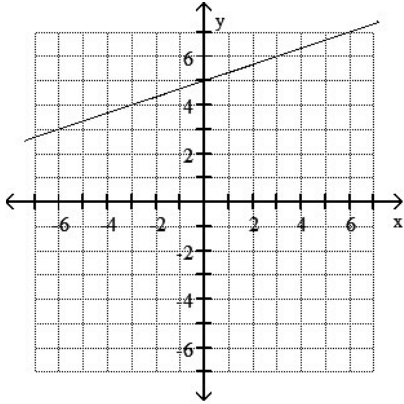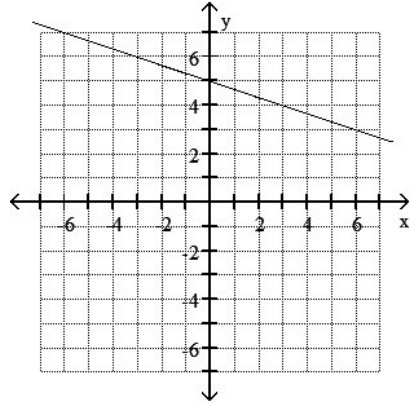
Objective: (2) Graph Equations in the Rectangular Coordinate System

12) $y = x^2 + 4$
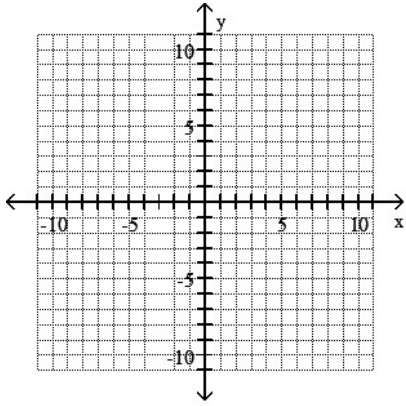
A)
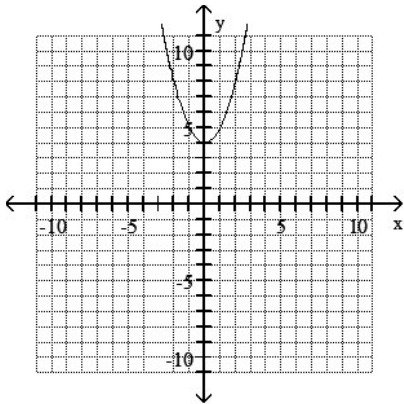
B)
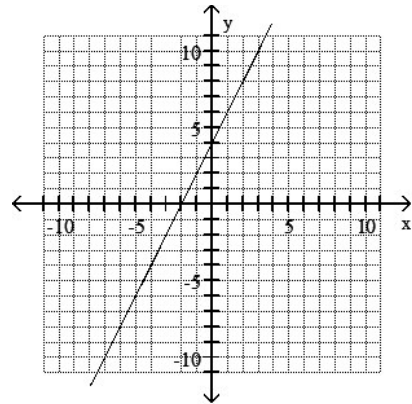
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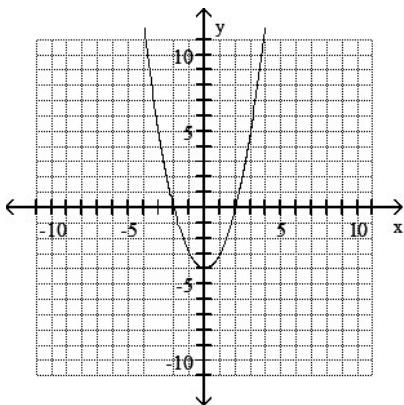
D)
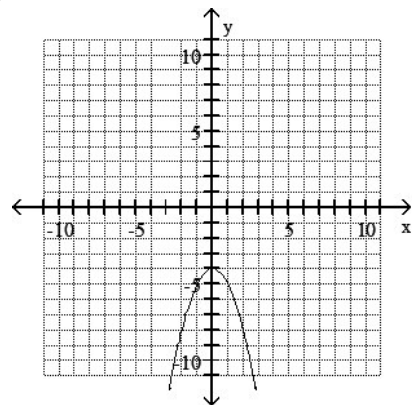
Objective: (2) Graph Equations in the Rectangular Coordinate System

11

13) $y = x^3 - 1$

A)

B)

C)

D)
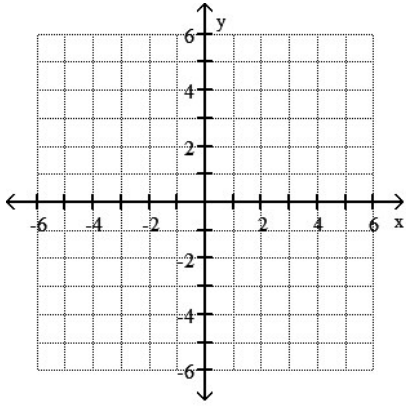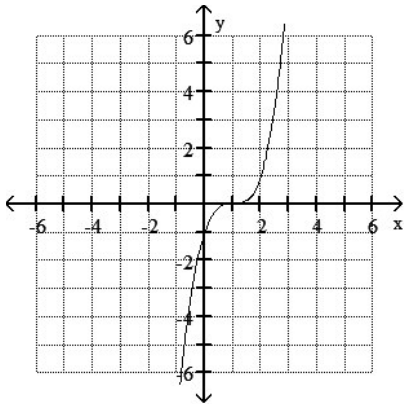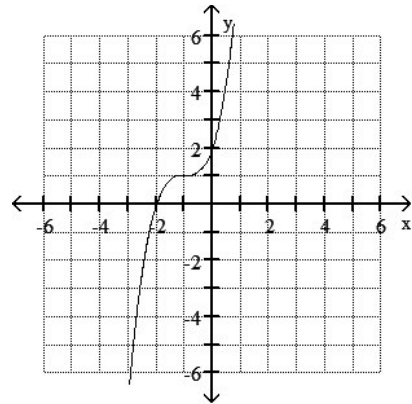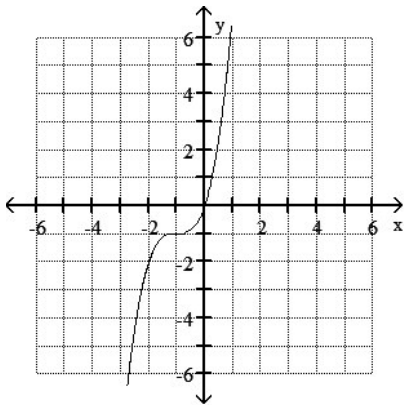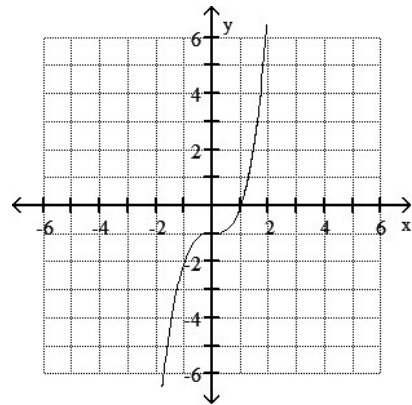
14) $y = -|x| + 7$

A)

B)

C)

D)
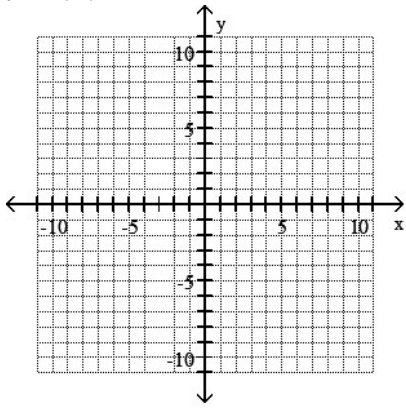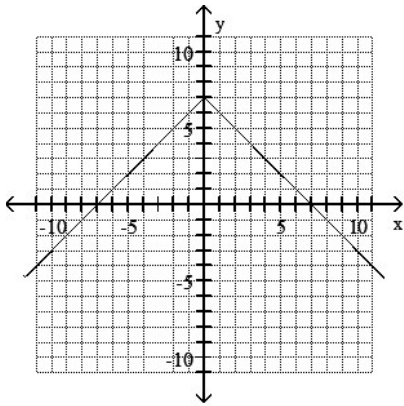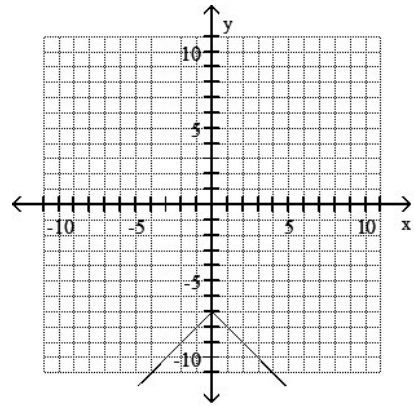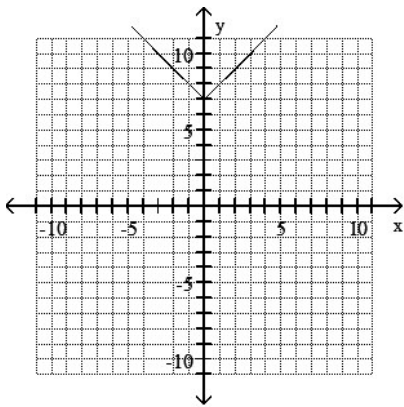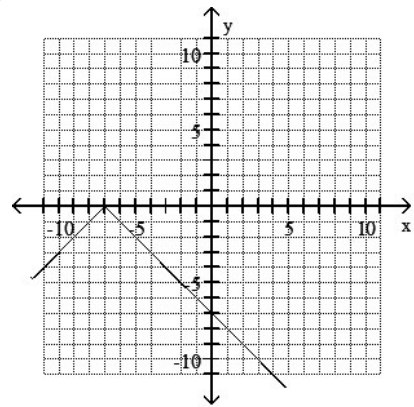
Objective: (2) Graph Equations in the Rectangular Coordinate System

15) $y = 5|x|$

A)

B)

C)

D)
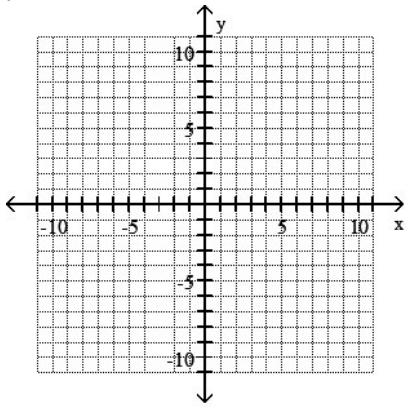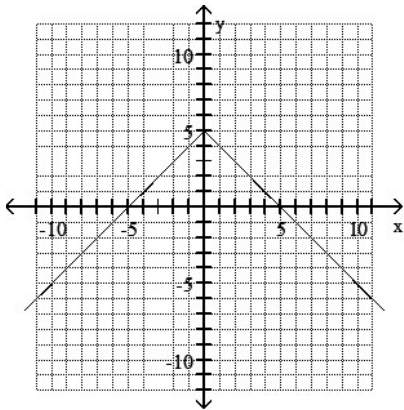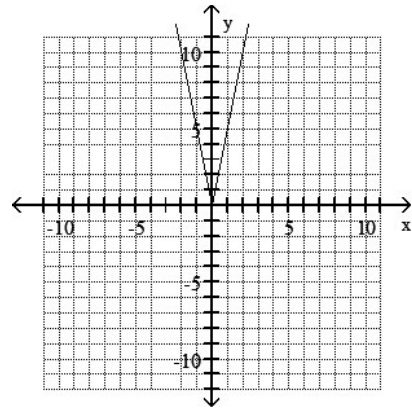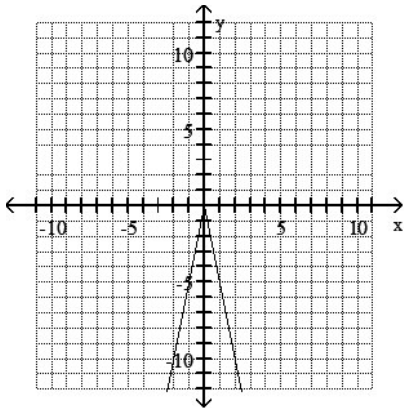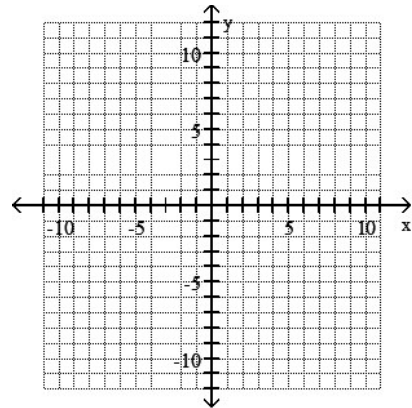
Objective: (2) Graph Equations in the Rectangular Coordinate System

16) y = 3

A)

B)

C)

D)
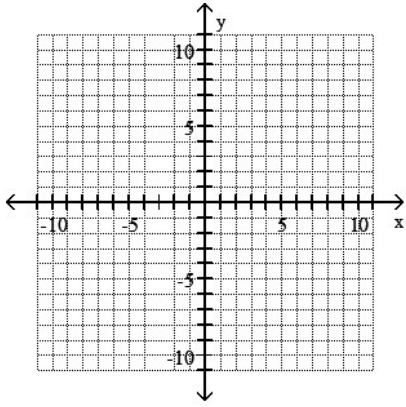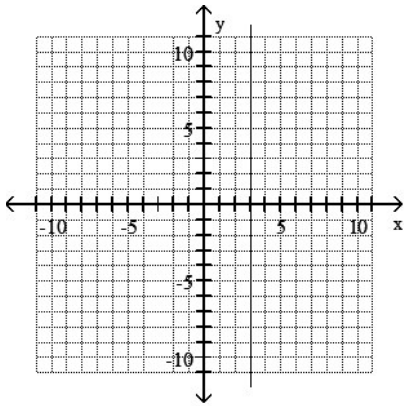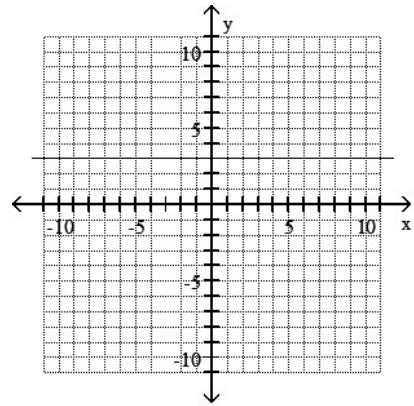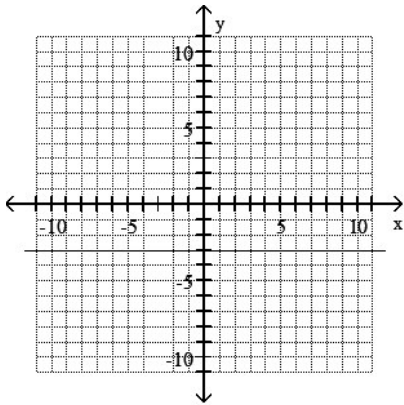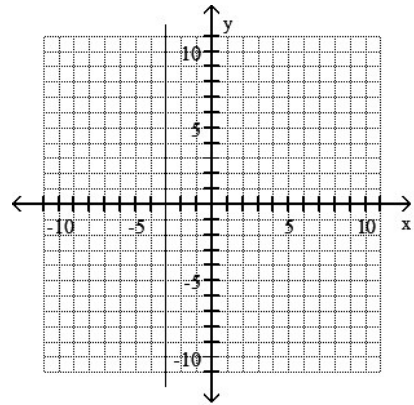
Objective: (2) Graph Equations in the Rectangular Coordinate System

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

A)

B)

C)

D)
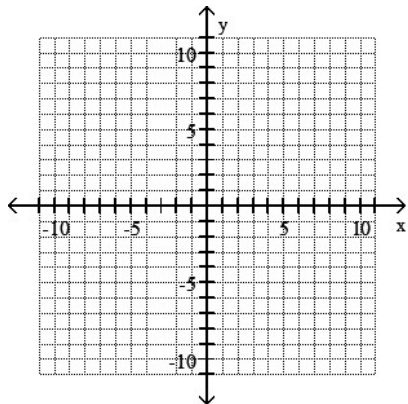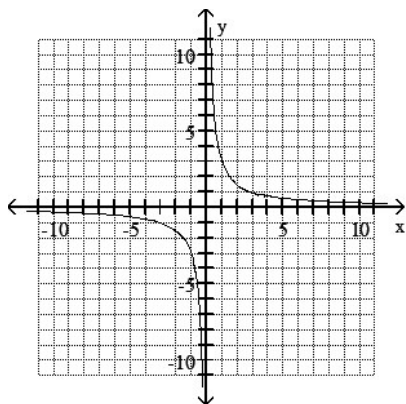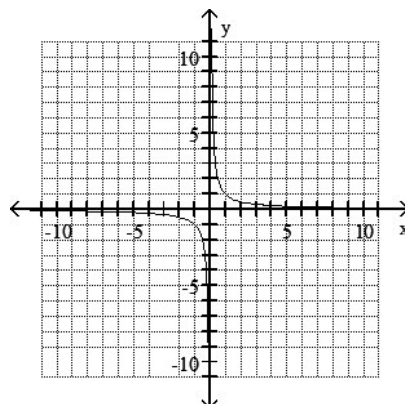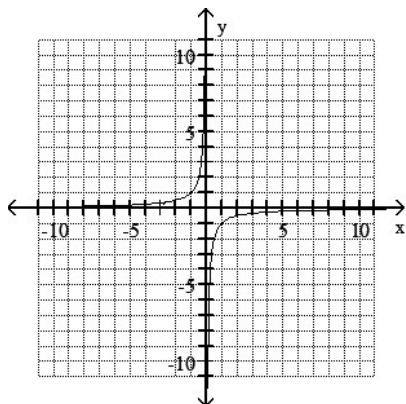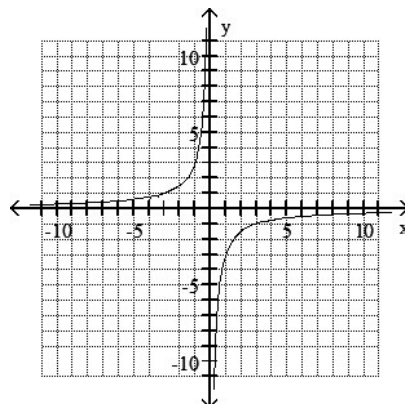
Write the English sentence as an equation in two variables. Then graph the equation.

18) The y-value is two more than four times the x-value.
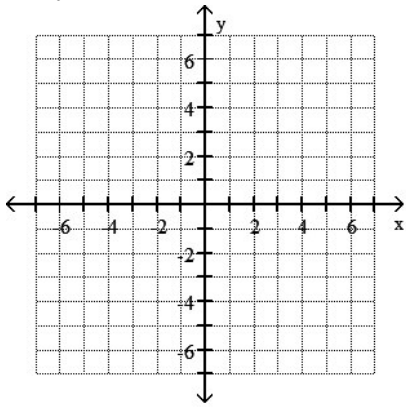
A) y = −4x + 2
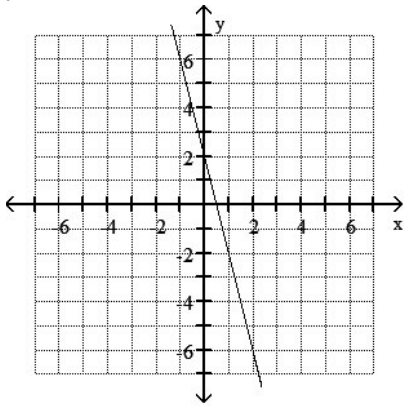
B) y = 4x + 2
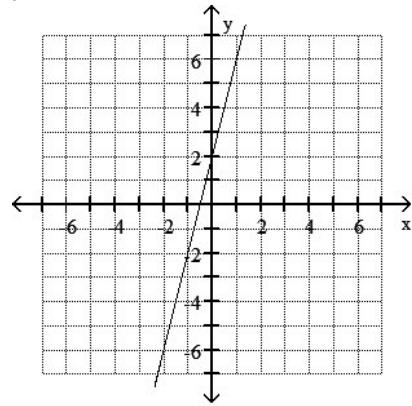
C) y = 4x − 2
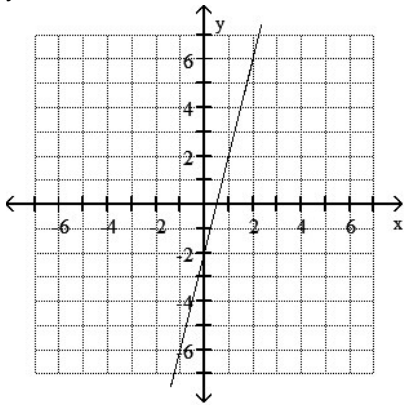
D) y = −4x − 2
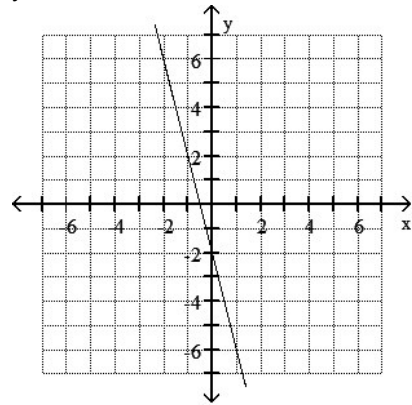
Objective: (2) Graph Equations in the Rectangular Coordinate System

19) The y-value is five decreased by the square of the x-value.
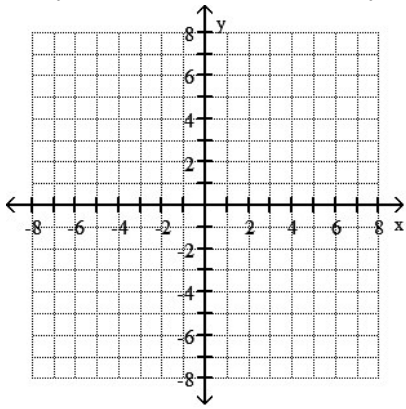
A) $y = x - 5$
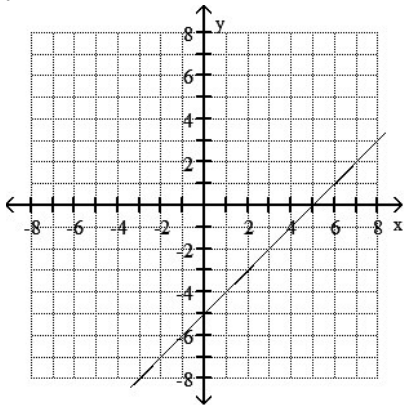
B) $y = x^2 - 5$
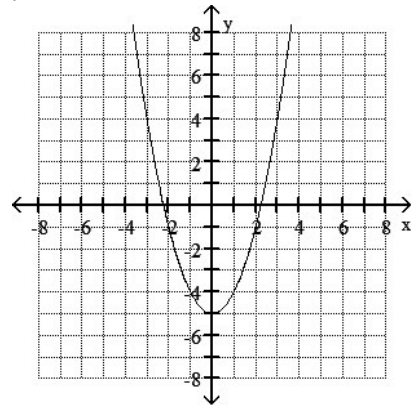
C) $y = 5 - x$
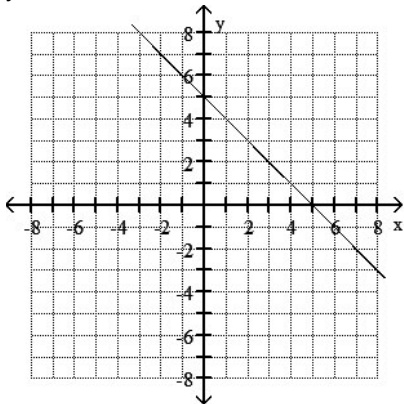
D) $y = 5 - x^2$

Objective: (2) Graph Equations in the Rectangular Coordinate System

18
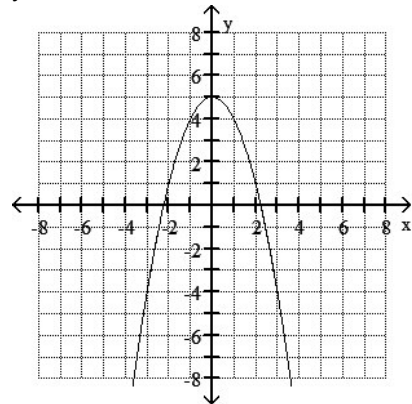
Match the correct viewing rectangle dimensions with the figure.

20)
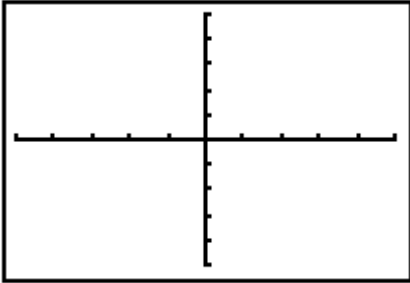
A) [−20, 10, 2] by [−20, 10, 2]   B) [−10, 10, 2] by [−10, 10, 2]
C) [−2, 2, 2] by [−2, 2, 2]   D) [−10, 10, 4] by [−10, 10, 4]

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

21)
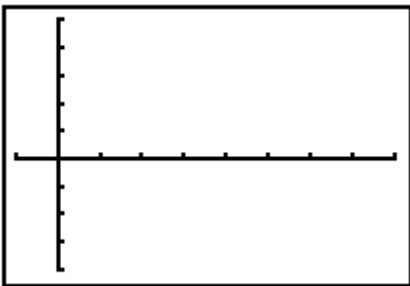
A) [−20, 25, 5] by [−5, 40, 5]   B) [−5, 40, 5] by [−5, 40, 5]
C) [−50, 25, 5] by [−50, 25, 5]   D) [−5, 40, 5] by [−20, 25, 5]

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

22)
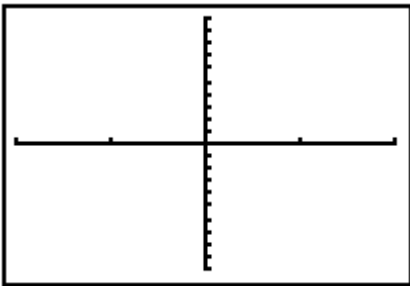
A) [−2, 2, 1] by [−40, 40, 4]   B) [−2, 2, 1] by [−2, 2, 1]
C) [−8, 8, 2] by [−2, 2, 1]   D) [−10, 10, 1] by [−10, 10, 1]

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

23)
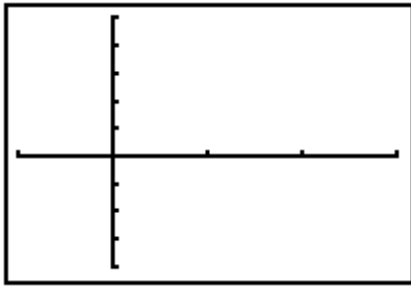
A) [–20, 60, 20] by [–800, 1,000, 200]   B) [–20, 10, 2] by [–20, 10, 2]
C) [–2, 10, 2] by [–8, 16, 2]   D) [–2, 16, 2] by [–2, 16, 2]

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

The table of values was generated by a graphing utility with a TABLE feature. Use the following table to solve.

X	Y_1	Y_2
-3	9	-3
-2	4	-1
-1	1	1
0	0	3
1	1	5
2	4	7
3	9	9

24) Which equation corresponds to Y_2 in the table?

A) $y_2 = 3 - 2x$ B) $y_2 = 2x + 3$ C) $y_2 = x + 3$ D) $y_2 = 3x - 2$

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

25) Does the graph of Y_1 pass through the origin?

A) Yes   B) No

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

26) At which points do the graph of Y_1 and Y_2 intersect?

A) (0, 3) and (0, 1)   B) (–1, 1) and (0, 3)   C) (–1, 1) and (3, 9)   D) (0, 1) and (3, 9)

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

27) For which values of x is $Y_1 = Y_2$?

A) –1 and 3   B) –1 and –3   C) –3 and 3   D) –3 and 2

Objective: (3) Interpret Information About a Graphing Utility's Viewing Rectangle or Table

Use the graph to determine the x– and y–intercepts.

28)
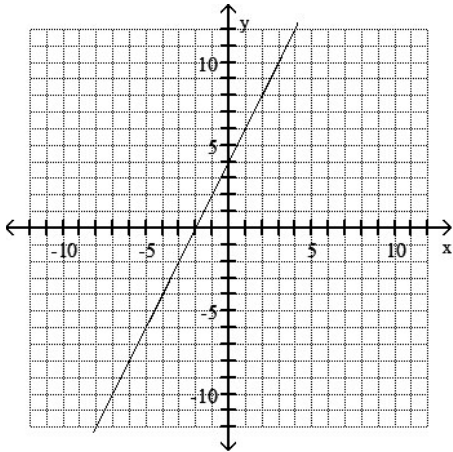
A) x–intercept: –2; y–intercept: 4   B) x–intercept: –2; y–intercept: –4
C) x–intercept: –4; y–intercept: 4   D) x–intercept: 2; y–intercept: 4

Objective: (4) Use a Graph to Determine Intercepts

29)
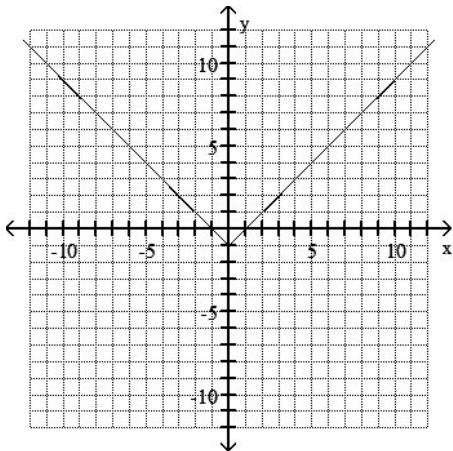
A) x–intercepts: –1, 1; y–intercept: –1   B) x–intercepts: –1, 1; y–intercept: 0
C) x–intercepts: –1, 1   D) y–intercept: –1

Objective: (4) Use a Graph to Determine Intercepts

30)
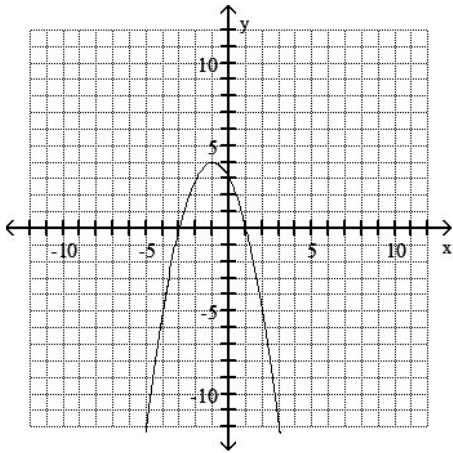
A) x–intercepts: –3, 1; y–intercept: 3   B) x–intercept: –3; y–intercepts: 1, 3
C) x–intercept: 1; y–intercept: 3   D) x–intercept: 3; y–intercepts: –3, 1

Objective: (4) Use a Graph to Determine Intercepts

31)
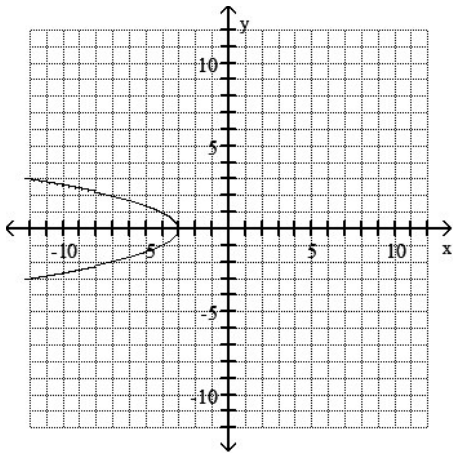
A) x–intercept: 3   B) y–intercept: 3   C) x–intercept: –3   D) y–intercept: –3

Objective: (4) Use a Graph to Determine Intercepts

22

32)
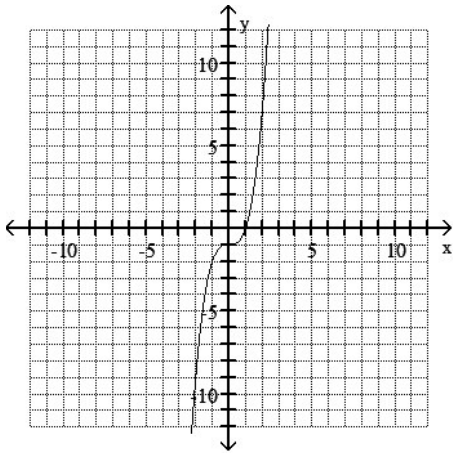
A) x–intercept: 1; y–intercept: 1   B) x–intercept: 1; y–intercept: –1
C) x–intercept: –1; y–intercept: –1   D) x–intercept: –1; y–intercept: 1

Objective: (4) Use a Graph to Determine Intercepts

33)
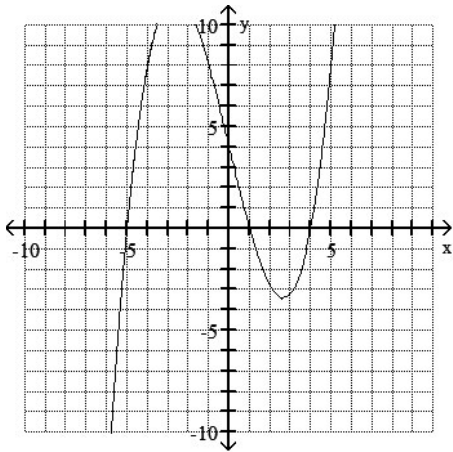
A) x–intercept: 4; y–intercepts: –4, 1, 5   B) x–intercepts: 4, 1, –5; y–intercept: 4
C) x–intercept: 4; y–intercepts: 4, 1, –5   D) x–intercepts: –4, 1, 5; y–intercept: 4

Objective: (4) Use a Graph to Determine Intercepts

34)
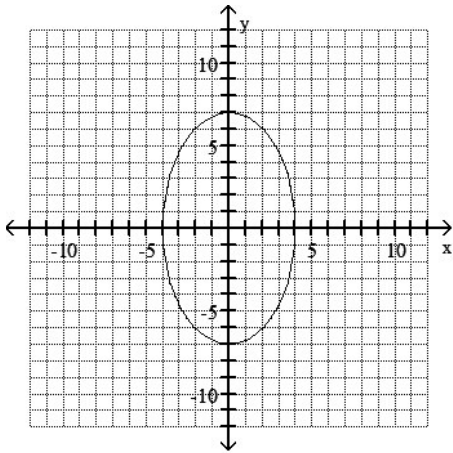
A) x–intercepts: –4, 4

B) x–intercepts: –4, 4; y–intercepts: –7, 7

C) y–intercepts: –7, 7

D) x–intercepts: –7, 7; y–intercepts: –4, 4

Objective: (4) Use a Graph to Determine Intercepts

The line graph shows the recorded hourly temperatures in degrees Fahrenheit at an airport.
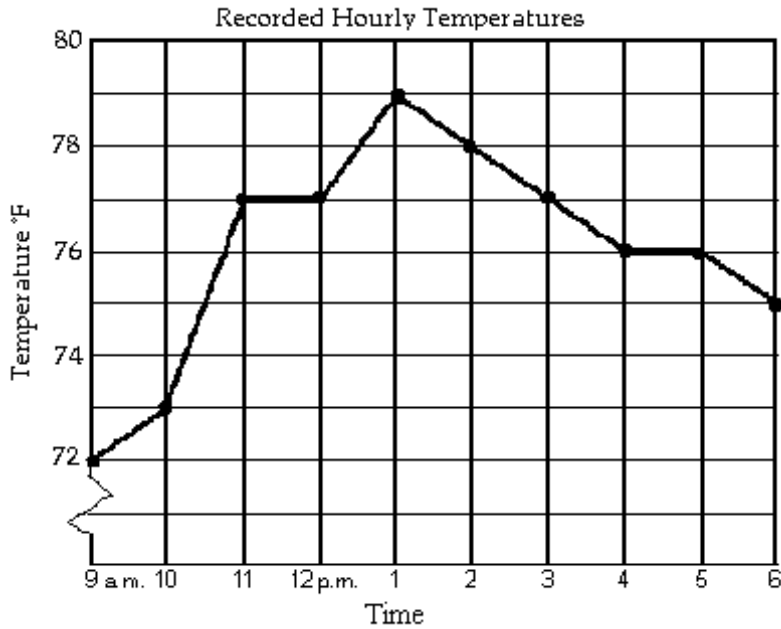
35) At what time was the temperature the highest?

A) 5 p.m.   B) 11 a.m.   C) 2 p.m.   D) 1 p.m.

Objective: (5) Interpret Information Given by Graphs

36) At what time was the temperature its lowest?

A) 9 a.m.   B) 1 p.m.   C) 4 p.m.   D) 6 p.m.

Objective: (5) Interpret Information Given by Graphs

37) What temperature was recorded at 10 a.m.?

A) 75 ° F   B) 73 ° F   C) 74 ° F   D) 71 ° F

Objective: (5) Interpret Information Given by Graphs

24

38) During which hour did the temperature increase the most?
   A) 12 p.m. to 1 p.m. B) 9 a.m. to 10 a.m. C) 1 p.m. to 2 p.m. D) 10 a.m. to 11 a.m.

39) At what time was the temperature 79°?
   A) 12 p.m. B) 1 p.m. C) 3 p.m. D) 4 p.m.

40) During which two hour period did the temperature increase the most?
   A) 9 a.m. to 11 a.m. B) 10 a.m. to 11 a.m. C) 10 a.m. to 12 p.m. D) 12 p.m. to 2 p.m.

Match the story with the correct figure.
   41) The amount of rainfall as a function of time, if the rain fell more and more softly.

A)

B)

C)

D)
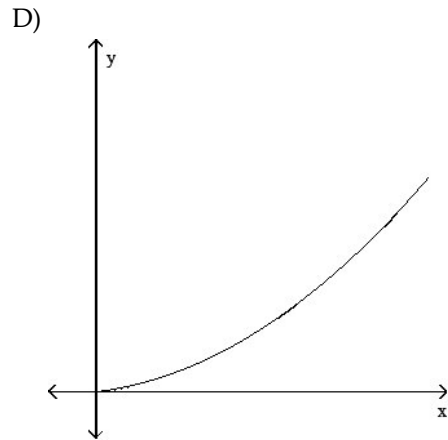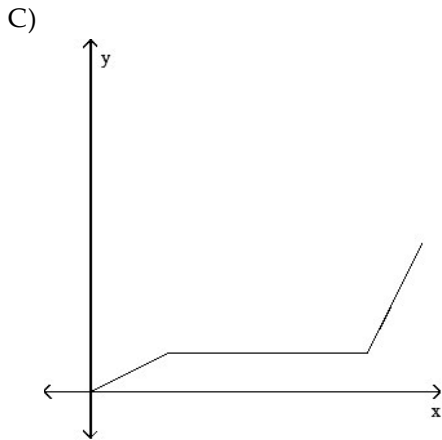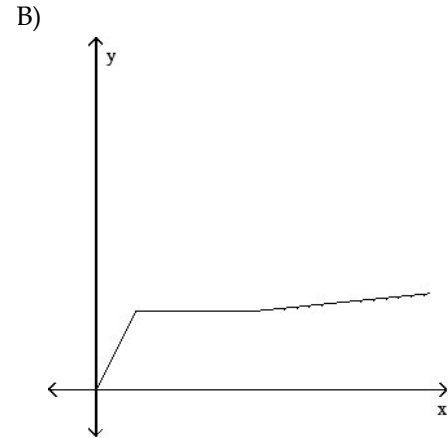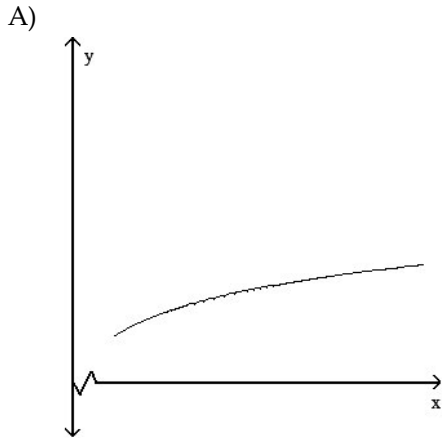
42) The height of an animal as a function of time.

A)

B)

C)

D)
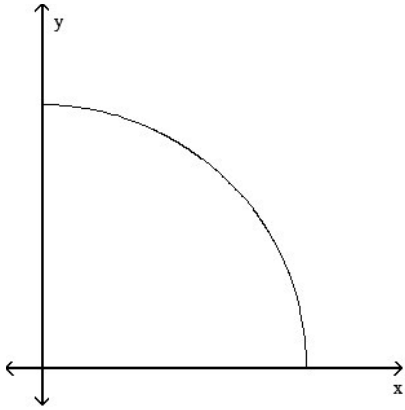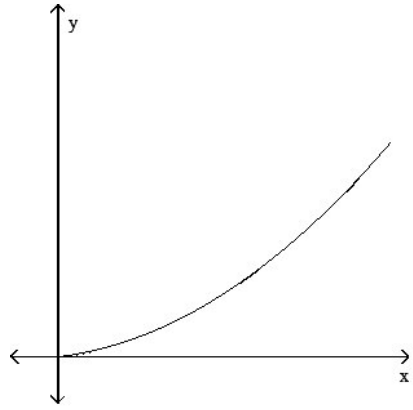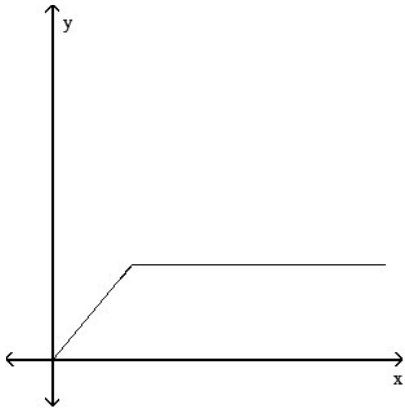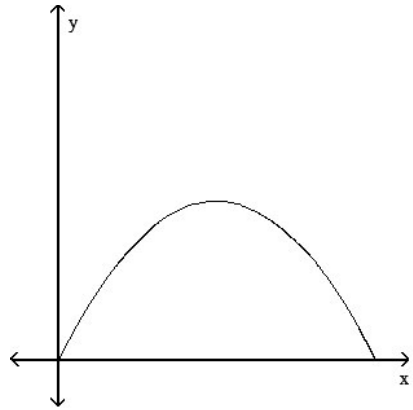
Objective: (5) Interpret Information Given by Graphs

43) Mark started out by walking up a hill for 5 minutes. For the next 5 minutes he walked down a steep hill to an elevation lower than his starting point. For the next 10 minutes he walked on level ground. For the next 10 minutes he walked uphill. Determine which graph of elevation above sea level versus time illustrates the story.

A)

B)

C)

D)
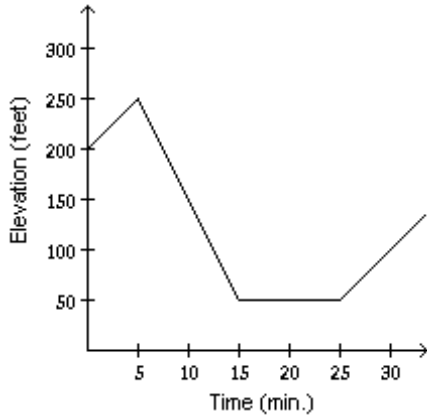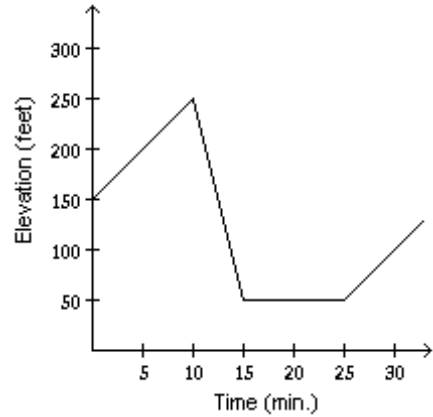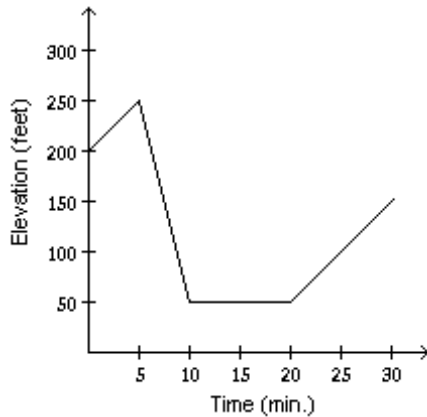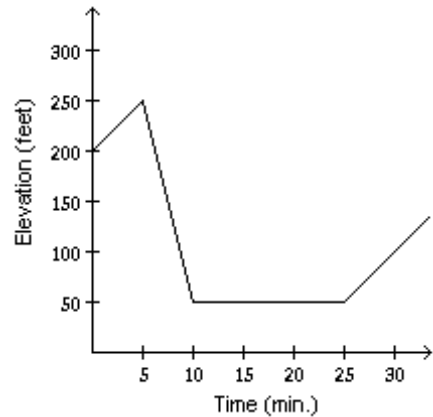
Objective: (5) Interpret Information Given by Graphs

Solve and check the linear equation.

44) $8x - 2 = 38$

   A) {36}   B) {5}   C) {6}   D) {32}

Objective: (1) Solve Linear Equations in One Variable

45) $5x - (4x - 1) = 2$

   A) $\left\{\dfrac{1}{9}\right\}$ B) {– 1}   C) $\left\{-\dfrac{1}{9}\right\}$ D) {1}

Objective: (1) Solve Linear Equations in One Variable

46) $4x + 6 = -8 + 8x$

   A) $\left\{\dfrac{2}{7}\right\}$ B) {– 6}   C) $\left\{-\dfrac{2}{7}\right\}$ D) $\left\{\dfrac{7}{2}\right\}$

Objective: (1) Solve Linear Equations in One Variable

47) $(4x + 2) - 3 = 5(x - 4)$

   A) {– 19}   B) {– 3}   C) {– 25}   D) {19}

Objective: (1) Solve Linear Equations in One Variable

48) $4x + 6 + 4(x + 1) = 6x + 6$

    A) $\{4\}$ B) $\{2\}$ C) $\{-1\}$ D) $\{-2\}$

Objective: (1) Solve Linear Equations in One Variable

49) $4[6x + 7 - 6(x + 1)] = -5x + 2$

    A) $\left\{-\dfrac{2}{5}\right\}$ B) $\{9\}$ C) $\left\{-\dfrac{1}{3}\right\}$ D) $\left\{\dfrac{54}{5}\right\}$

Objective: (1) Solve Linear Equations in One Variable

50) $3^2 - 2(5 - 2)^2 = 54x$

    A) $\left\{-\dfrac{1}{6}\right\}$ B) $\{0\}$ C) $\left\{\dfrac{7}{6}\right\}$ D) $\{6\}$

Objective: (1) Solve Linear Equations in One Variable

51) $0.39(70) + 0.60x = 0.50(70 + x)$

    A) $\{90\}$ B) $\{70\}$ C) $\{40\}$ D) $\{80\}$

Objective: (1) Solve Linear Equations in One Variable

52) $0.60x - 0.50(50 + x) = -0.42(50)$

    A) $\{50\}$ B) $\{20\}$ C) $\{30\}$ D) $\{40\}$

Objective: (1) Solve Linear Equations in One Variable

Find all values of x satisfying the given conditions.

53) $y_1 = 8x + 4(4 + x)$, $y_2 = 3(x - 6) + 10x$, and $y_1 = y_2$

    A) $\{34\}$ B) $\{-34\}$ C) $\{10\}$ D) $\{-10\}$

Objective: (1) Solve Linear Equations in One Variable

Find all values of x such that y = 0.

54) $y = 2[5x - (6x - 5)] - 8(x - 5)$

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

Objective: (1) Solve Linear Equations in One Variable

Solve the equation.

55) $\dfrac{x}{2} = \dfrac{x}{5} + 4$

    A) $\{20\}$ B) $\{10\}$ C) $\left\{\dfrac{40}{3}\right\}$ D) $\{8\}$

Objective: (2) Solve Linear Equations Containing Fractions

56) $\dfrac{x}{9} = \dfrac{x}{7} + \dfrac{4}{9}$

    A) $\left\{-\dfrac{4}{9}\right\}$ B) 0 C) $\left\{-\dfrac{1}{14}\right\}$ D) $\{-14\}$

Objective: (2) Solve Linear Equations Containing Fractions

57) $27 - \dfrac{x}{2} = \dfrac{x}{7}$

    A) {3}   B) $\left\{\dfrac{243}{14}\right\}$ C) $\left\{\dfrac{243}{2}\right\}$ D) {42}

58) $\dfrac{2x}{5} = \dfrac{x}{3} + 5$

    A) {−150}   B) {150}   C) {−75}   D) {75}

59) $\dfrac{3x}{4} - x = \dfrac{x}{32} - \dfrac{7}{8}$

    A) {− 4}   B) $\left\{\dfrac{28}{9}\right\}$ C) {4}   D) $\left\{-\dfrac{28}{9}\right\}$

60) $\dfrac{x + 7}{6} = \dfrac{13}{12} - \dfrac{x - 2}{4}$

    A) {0}   B) $\left\{\dfrac{21}{2}\right\}$ C) {26}   D) {1}

61) $\dfrac{x - 8}{-4} + \dfrac{x + 5}{5} = x - 6$

    A) $\left\{\dfrac{20}{7}\right\}$ B) $\left\{\dfrac{20}{3}\right\}$ C) $\left\{\dfrac{60}{7}\right\}$ D) $\left\{\dfrac{100}{21}\right\}$

Find all values of x satisfying the given conditions.

62) $y_1 = \dfrac{x + 6}{3}$, $y_2 = \dfrac{x + 8}{6}$, and $y_1 = y_2$

    A) {−4}   B) {4}   C) {3}   D) {−12}

Find all values of x such that y = 0.

63) $y = \dfrac{x + 6}{6} + \dfrac{x - 3}{4} - \dfrac{2}{3}$

    A) {1}   B) {16}   C) {0}   D) $\left\{\dfrac{13}{2}\right\}$

First, write the value(s) that make the denominator(s) zero. Then solve the equation.

64) $\dfrac{6}{x} = \dfrac{5}{2x} + 21$

    A) No restrictions; {3}   B) $x \neq 0$; $\left\{\dfrac{1}{6}\right\}$ C) $x \neq 0$; {6}   D) $x \neq 0, 2$; $\left\{\dfrac{85}{14}\right\}$

    Objective: (3) Solve Rational Equations with Variables in the Denominators

65) $\dfrac{7}{x} + 3 = \dfrac{1}{2x} + \dfrac{16}{5}$

    A) $x \neq 0$; $\left\{\dfrac{65}{2}\right\}$ B) $x \neq 0, 2, 5$; $\left\{\dfrac{65}{2}\right\}$

    C) No restrictions; $\left\{\dfrac{2}{65}\right\}$ D) $x \neq 0$; $\left\{\dfrac{2}{65}\right\}$

    Objective: (3) Solve Rational Equations with Variables in the Denominators

66) $\dfrac{x - 3}{4x} + 2 = \dfrac{x + 9}{x}$

    A) $x \neq 0$; $\left\{\dfrac{39}{5}\right\}$ B) $x \neq 0, 4$; $\left\{\dfrac{39}{5}\right\}$

    C) No restrictions; $\left\{\dfrac{3}{2}\right\}$ D) $x \neq 0$; $\left\{-\dfrac{37}{3}\right\}$

    Objective: (3) Solve Rational Equations with Variables in the Denominators

67) $\dfrac{5}{x - 2} + 1 = \dfrac{9}{x - 2}$

    A) $x \neq 2$; {6}   B) $x \neq -2$; {16}   C) $x \neq -2$; {6}   D) $x \neq 2$; $\varnothing$

    Objective: (3) Solve Rational Equations with Variables in the Denominators

68) $\dfrac{21}{7x - 7} + \dfrac{1}{7} = \dfrac{3}{x - 1}$

    A) $x \neq 7$; {1}   B) $x \neq 1$; $\varnothing$ C) $x \neq 1$; {1}   D) $x \neq -1, 7$; {1, 7}

    Objective: (3) Solve Rational Equations with Variables in the Denominators

69) $\dfrac{7}{x + 1} + \dfrac{3}{x - 1} = \dfrac{6}{(x + 1)(x - 1)}$

    A) $x \neq -1, 1$; $\varnothing$ B) No restrictions; {1}   C) $x \neq -1$; {1}   D) $x \neq -1, 1$; {2}

    Objective: (3) Solve Rational Equations with Variables in the Denominators

Solve the equation.

70) $\dfrac{x}{2x + 2} = \dfrac{-2x}{4x + 4} + \dfrac{2x - 3}{x + 1}$

    A) {-3}   B) $\left\{\dfrac{3}{2}\right\}$ C) {3}   D) $\left\{-\dfrac{12}{5}\right\}$

    Objective: (3) Solve Rational Equations with Variables in the Denominators

71) $\dfrac{7}{y + 5} - \dfrac{4}{y - 5} = \dfrac{2}{y^2 - 25}$

    A) {57}   B) $\{\sqrt{51}\}$ C) {19}   D) {–19}

72) $\dfrac{1}{x + 4} + \dfrac{2}{x + 3} = \dfrac{-1}{x^2 + 7x + 12}$

    A) {0}   B) {–4}   C) ∅   D) {3}

73) $\dfrac{m + 5}{m^2 + 6m + 5} - \dfrac{5}{m^2 + 10m + 25} = \dfrac{m - 5}{m^2 + 6m + 5}$

    A) {–45}   B) {9}   C) {–15}   D) {–9}

Find all values of x satisfying the given conditions.

74) $y_1 = \dfrac{1}{x + 4}$, $y_2 = \dfrac{2}{x + 3}$, $y_3 = \dfrac{-1}{x^2 + 7x + 12}$, and $y_1 + y_2 = y_3$

    A) {–4}   B) {3}   C) {0}   D) ∅

75) $y_1 = \dfrac{5}{x + 4}$, $y_2 = \dfrac{2}{x - 4}$, $y_3 = \dfrac{14}{x^2 - 16}$, and $y_1 - y_2 = y_3$

    A) {42}   B) {14}   C) $\{2\sqrt{3}\}$ D) {–14}

Determine whether the equation is an identity, a conditional equation, or an inconsistent equation.

76) $2(2x + 18) = 4x + 36$

    A) Identity   B) Conditional equation   C) Inconsistent equation

77) $5x + 7x = 11x$

    A) Identity   B) Conditional equation   C) Inconsistent equation

78) $-3(x - 7) - 35 = 4x - 7(x - 6)$

    A) Identity   B) Conditional equation   C) Inconsistent equation

79) $5x + 5(-2x - 6) = -28 - 7x$

    A) Identity   B) Conditional equation   C) Inconsistent equation

80) $10x + 13(x + 1) = 23(x + 1) - 10$

    A) Identity   B) Conditional equation   C) Inconsistent equation

81) $9x - 9 + 8x - 4 = 8x + 9x - 16$

    A) Identity   B) Conditional equation   C) Inconsistent equation

82) $\dfrac{8x}{x} = 8$

    A) Identity   B) Conditional equation   C) Inconsistent equation

83) $\dfrac{9x}{x-5} = \dfrac{45}{x-5} + 6$

    A) Identity   B) Conditional equation   C) Inconsistent equation

84) $\dfrac{5x+7}{6} + \dfrac{5}{6} = -\dfrac{3x}{4}$

    A) Identity   B) Conditional equation   C) Inconsistent equation

85) $\dfrac{7}{y+4} - \dfrac{9}{y-4} = \dfrac{10}{y^2 - 16}$

    A) Identity   B) Conditional equation   C) Inconsistent equation

86) $\dfrac{1}{x+7} + \dfrac{3}{x+4} = \dfrac{-3}{x^2 + 11x + 28}$

    A) Identity   B) Conditional equation   C) Inconsistent equation

Solve the problem.

87) There is a relationship between the expected number of tickets sold for a raffle and the dollar value of the prize for the raffle. The equation $T - 9P = 250$ describes this relationship, where T is the expected number of tickets sold, and P is the dollar value of the raffle prize. Suppose the expected ticket sales for a certain raffle are 3,850. Substitute 3,850 into the equation to determine the dollar value of the raffle prize.

    A) $34,900   B) $350   C) $3,600   D) $400

88) The equation $V = -2{,}000t + 23{,}000$ describes the value in dollars of a certain model of car after it is t years old. If a car is worth $13,000, substitute 13,000 into the equation to find the age of the car.

    A) 7 years   B) 5 years   C) 4 years   D) 6 years

89) A certain store has a fax machine available for use by its customers. The store charges $2.50 to send the first page and $0.65 for each subsequent page. The total price, P, for the faxing x pages can be modeled by the formula $P = 0.65(x - 1) + 2.50$. Determine the number of pages that can be faxed for $8.35.

    A) 13 pages   B) 3 pages   C) 10 pages   D) 59 pages

90) A local race for charity has taken place since 1993. Using the actual speeds of the winners from 1993 through 1998, mathematicians obtained the formula y = 0.18x + 4.5, in which x represents the number of years after 1993 and y represents the winning speed in miles per hour. In what year is the winning speed predicted to be 6.48 mph?

    A) 2,004   B) 2,003   C) 2,006   D) 2,005

Objective: (5) Solve Applied Problems Using Mathematical Models

91) A car rental agency charges $150 per week plus $0.20 per mile to rent a car. The total cost, C, for the renting the car for one week and driving it x miles can be modeled by the formula C = 0.20x + 150. How many miles can you travel in one week for $230?

    A) 1150 miles   B) 196 miles   C) 375 miles   D) 400 miles

Objective: (5) Solve Applied Problems Using Mathematical Models

92) The formula $y = \dfrac{25{,}000 + 230x}{x}$ models the average cost per unit, y, for Electrostuff to manufacture x units of Electrogadget IV. How many units must the company produce to have an average cost per unit of $340?

    A) 227 units   B) 209 units   C) 229 units   D) 109 units

Objective: (5) Solve Applied Problems Using Mathematical Models

93) Suppose a cost–benefit model is given by $y = \dfrac{2{,}726x}{100 - x}$, where y is the cost for removing x percent of a given pollutant. What percent of pollutant can be removed for $30,000? Round your answer to the nearest tenth of a percent.

    A) 523.9%   B) 9.2%   C) 91.7%   D) 110.0%

Objective: (5) Solve Applied Problems Using Mathematical Models

94) The U.S. Maritime Administration estimated that the cost per ton of building an oil tanker could be represented by the model $y = \dfrac{110{,}000}{x + 205}$, where y is the cost in dollars per ton and x is the tons (in thousands). What size of oil tanker (in thousands of tons) can be built for $200 per ton?

    A) 345 thousand tons   B) 755 thousand tons   C) 272 thousand tons   D) 35 thousand tons

Objective: (5) Solve Applied Problems Using Mathematical Models

Use the five–step strategy for solving word problems to find the number or numbers described in the following exercise.

95) When four times the number is added to 7 times the number, the result is 55. What is the number?

    A) 0.5   B) –7.9   C) 5   D) 7.9

Objective: (1) Use Linear Equations to Solve Problems

96) When 4 times a number is subtracted from 7 times the number, the result is 33. What is the number?

    A) –11   B) 1   C) 11   D) 3

Objective: (1) Use Linear Equations to Solve Problems

97) When a number is decreased by 60% of itself, the result is 128. What is the number?

    A) 19   B) 320   C) 192   D) 533

Objective: (1) Use Linear Equations to Solve Problems

98) When 90% of a number is added to the number, the result is 76. What is the number?

    A) 190   B) 47   C) 36   D) 40

Objective: (1) Use Linear Equations to Solve Problems

99) 10% of what number is 57?

    A) 570   B) 5.7   C) 5,700   D) 57

100) One number exceeds another by 13. The sum of the numbers is –1. What are the numbers?

    A) 5 and –6   B) 6 and –7   C) –6 and –6   D) No solution

Find all values of x satisfying the given conditions.

101) $y_1 = 9x$, $y_2 = (8x - 1)$, and y_1 exceeds y_2 by 2.

    A) $\{-1\}$ B) $\{1\}$ C) $\left\{-\dfrac{1}{17}\right\}$ D) $\left\{\dfrac{1}{17}\right\}$

102) $y_1 = x$, $y_2 = 3 + x$, $y_3 = 3(x - 2) + 10x$, and the sum of 8 times y_1 and 4 times y_2 equals y_3.

    A) $\{-18\}$ B) $\{18\}$ C) $\{-5\}$ D) $\{5\}$

103) $y_1 = \dfrac{1}{x + 7}$, $y_2 = \dfrac{1}{x + 6}$, $y_3 = \dfrac{-1}{x^2 + 13x + 42}$, and the sum of y_1 and 5 times y_2 is y_3.

    A) $\{6\}$ B) $\{-7\}$ C) $\{0\}$ D) $\varnothing$

104) $y_1 = \dfrac{1}{x + 2}$, $y_2 = \dfrac{1}{x - 2}$, $y_3 = \dfrac{1}{x^2 - 4}$, and the difference between 7 times y_1 and 4 times y_2 is the product of 2 and y_3.

    A) $\{\sqrt{30}\}$ B) $\{8\}$ C) $\{24\}$ D) $\{-8\}$

Solve the problem.

105) A car rental agency charges $225 per week plus $0.20 per mile to rent a car. How many miles can you travel in one week for $305?

    A) 1525 miles   B) 375 miles   C) 286 miles   D) 400 miles

106) A train ticket in a certain city is $3.00. People who use the train also have the option of purchasing a frequent rider pass for $18.00 each month. With the pass, each ticket costs only $2.25. Determine the number of times in a month the train must be used so that the total monthly cost without the pass is the same as the total monthly cost with the pass.

    A) 26 times   B) 23 times   C) 24 times   D) 25 times

107) You inherit $10,000 with the stipulation that for the first year the money must be invested in two stocks paying 6% and 11% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $900?

    A) $4,000 invested at 6%; $6,000 invested at 11%   B) $3,000 invested at 6%; $7,000 invested at 11%
    C) $6,000 invested at 6%; $4,000 invested at 11%   D) $5,000 invested at 6%; $5,000 invested at 11%

Objective: (1) Use Linear Equations to Solve Problems

108) You inherit $28,000 from a very wealthy grandparent, with the stipulation that for the first year, the money must be invested in two stocks paying 4% and 10% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $1,600?

    A) $8,000 invested at 4%; $20,000 invested at 10%   B) $10,000 invested at 4%; $18,000 invested at 10%
    C) $20,000 invested at 4%; $8,000 invested at 10%   D) $18,000 invested at 4%; $10,000 invested at 10%

Objective: (1) Use Linear Equations to Solve Problems

109) A bookcase is to be constructed as shown in the figure below.   The height of the bookcase is 4 feet longer than the length of a shelf. If 26 feet of lumber is available for the entire unit (including the shelves, but NOT the back of the bookcase), find the length and height of the unit.
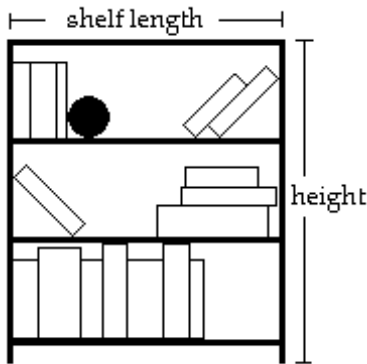
    A) length = 3 feet; height = 7 feet   B) length = 4.5 feet; height = 8.5 feet
    C) length = 11.0 feet; height = 13.5 feet   D) length = 3 feet; height = 12 feet

Objective: (1) Use Linear Equations to Solve Problems

110) An auto repair shop charged a customer $320 to repair a car. The bill listed $50 for parts and the remainder for labor. If the cost of labor is $30 per hour, how many hours of labor did it take to repair the car?

    A) 9.5 hours   B) 10 hours   C) 8 hours   D) 9 hours

Objective: (1) Use Linear Equations to Solve Problems

111) After a 16% price reduction, a boat sold for $26,040. What was the boat's price before the reduction? (Round to the nearest cent, if necessary.)

    A) $162,750.00   B) $30,206.40   C) $4,166.40   D) $31,000

Objective: (1) Use Linear Equations to Solve Problems

112) Inclusive of a 7.7% sales tax, a diamond ring sold for $2,046.30. Find the price of the ring before the tax was added. (Round to the nearest cent, if necessary.)

    A) $2,203.87   B) $1,888.73   C) $157.57   D) $1,900

Objective: (1) Use Linear Equations to Solve Problems

113) The length of a rectangular room is 5 feet longer than twice the width. If the room's perimeter is 142 feet, what are the room's dimensions?
    A) Width = 33 ft; length = 38 ft   B) Width = 44 ft; length = 98 ft
    C) Width = 22 ft; length = 49 ft   D) Width = 27 ft; length = 59 ft

114) There are 24 more sophomores than juniors in an 8 AM algebra class. If there are 60 students in this class, find the number of sophomores and the number of juniors in the class.
    A) 42 sophomores; 18 juniors   B) 18 sophomores; 42 juniors
    C) 60 sophomores; 36 juniors   D) 84 sophomores; 36 juniors

115) The president of a certain university makes three times as much money as one of the department heads. If the total of their salaries is $180,000, find each worker's salary.
    A) president's salary = $13,500; department head's salary = $4,500
    B) president's salary = $135,000; department head's salary = $45,000
    C) president's salary = $45,000; department head's salary = $135,000
    D) president's salary = $90,000; department head's salary = $45,000

116) During a road trip, Tony drove one–third the distance that Lana drove. Mark drives 21 more miles than Lana drove. The total distance they drove on the trip was 259 miles. How many miles did each person drive?
    A) Tony drove 102 miles, Lana drove 306 miles, and Mark drove 327 miles.
    B) Tony drove 306 miles, Lana drove 102 miles, and Mark drove 81 miles.
    C) Tony drove 27 miles, Lana drove 81 miles, and Mark drove 102 miles.
    D) Tony drove 34 miles, Lana drove 102 miles, and Mark drove 123 miles.

117) The sum of the angles of a triangle is 180°. Find the three angles of the triangle if one angle is twice the smallest angle and the third angle is 28° greater than the smallest angle.
    A) 38°, 76°, 66°   B) 24°, 48°, 108°   C) 24°, 52°, 104°   D) 30°, 60°, 90°

118) In a recent International Gymnastics competition, the U.S., China, and Romania were the big winners. If the total number of medals won by each team are three consecutive integers whose sum is 81 and the U.S. won more than China who won more than Romania, how many medals did each team win?
    A) U.S.: 29 medals; China: 28 medals; Romania: 27 medals
    B) U.S.: 28 medals; China: 27 medals; Romania: 26 medals
    C) U.S.: 83 medals; China: 82 medals; Romania: 81 medals
    D) U.S.: 26 medals; China: 25 medals; Romania: 24 medals

119) Megan is having her yard landscaped. She obtained an estimate from two landscaping companies. Company A gave an estimate of $230 for materials and equipment rental plus $55 per hour for labor. Company B gave an estimate of $310 for materials and equipment rental plus $45 per hour for labor. Determine how many hours of labor will be required for the two companies to cost the same.
    A) 11 hours   B) 8 hours   C) 7 hours   D) 12 hours

120) Sergio's internet provider charges its customers $7 per month plus 4¢ per minute of on–line usage. Sergio received a bill from the provider covering a 5–month period and was charged a total of $62.20. How many minutes did he spend on–line during that period? (Round to the nearest whole minute, if necessary.)

    A) The number of minutes is 68.
                    B) The number of minutes is 768.

    C) The number of minutes is 818.
                    D) The number of minutes is 680.

Solve the formula for the specified variable.

121) $A = \frac{1}{2}bh$ for b

    A) $b = \frac{h}{2A}$ B) $b = \frac{Ah}{2}$ C) $b = \frac{A}{2h}$ D) $b = \frac{2A}{h}$

122) $S = 2\pi rh + 2\pi r^2$ for h

    A) $h = 2\pi(S - r)$ B) $h = \frac{S}{2\pi r} - 1$ C) $h = \frac{S - 2\pi r^2}{2\pi r}$ D) $h = S - r$

123) $V = \frac{1}{3}Bh$ for h

    A) $h = \frac{3B}{V}$ B) $h = \frac{B}{3V}$ C) $h = \frac{V}{3B}$ D) $h = \frac{3V}{B}$

124) $F = \frac{9}{5}C + 32$ for C

    A) $C = \frac{F - 32}{9}$ B) $C = \frac{9}{5}(F - 32)$ C) $C = \frac{5}{9}(F - 32)$ D) $C = \frac{5}{F - 32}$

125) $A = \frac{1}{2}h(a + b)$ for a

    A) $a = \frac{hb - 2A}{h}$ B) $a = \frac{A - hb}{2h}$ C) $a = \frac{2Ab - h}{h}$ D) $a = \frac{2A - hb}{h}$

126) $d = rt$ for t

    A) $t = \frac{d}{r}$ B) $t = dr$ C) $t = d - r$ D) $t = \frac{r}{d}$

127) $P = 2L + 2W$ for W

    A) $W = \frac{P - 2L}{2}$ B) $W = P - L$ C) $W = P - 2L$ D) $W = \frac{P - L}{2}$

128) $A = P(1 + nr)$ for n

    A) $n = \dfrac{Pr}{A - P}$ B) $n = \dfrac{A - P}{Pr}$ C) $n = \dfrac{P - A}{Pr}$ D) $n = \dfrac{A}{r}$

    Objective: (2) Solve a Formula for a Variable

129) $I = Prt$ for t

    A) $t = P - Ir$ B) $t = \dfrac{P - I}{1 + r}$ C) $t = \dfrac{I}{Pr}$ D) $t = \dfrac{P - 1}{Ir}$

    Objective: (2) Solve a Formula for a Variable

130) $\dfrac{1}{a} + \dfrac{1}{b} = \dfrac{1}{c}$ for c

    A) $c = ab(a + b)$ B) $c = a + b$ C) $c = \dfrac{ab}{a + b}$ D) $c = \dfrac{a + b}{ab}$

    Objective: (2) Solve a Formula for a Variable

131) $P = \dfrac{A}{1 + rt}$ for r

    A) $r = P - At$ B) $r = \dfrac{P - A}{1 + t}$ C) $r = \dfrac{A - P}{Pt}$ D) $r = \dfrac{P - 1}{At}$

    Objective: (2) Solve a Formula for a Variable

132) $A = \dfrac{1}{2}h(B + b)$ for B

    A) $B = \dfrac{2A + bh}{h}$ B) $B = 2A - bh$ C) $B = \dfrac{A - bh}{h}$ D) $B = \dfrac{2A - bh}{h}$

    Objective: (2) Solve a Formula for a Variable

133) $P = s_1 + s_2 + s_3$ for s_3

    A) $s_3 = P + s_1 + s_2$ B) $s_3 = P + s_1 - s_2$ C) $s_3 = P - s_1 - s_2$ D) $s_3 = s_1 + s_2 - P$

    Objective: (2) Solve a Formula for a Variable

134) $I = \dfrac{nE}{nr + R}$ for n

    A) $n = \dfrac{IR}{E - Ir}$ B) $n = \dfrac{-R}{Ir - E}$ C) $n = IR(Ir - E)$ D) $n = \dfrac{IR}{Ir + E}$

    Objective: (2) Solve a Formula for a Variable

Add or subtract as indicated and write the result in standard form.

135) $(6 - 7i) + (5 + 4i)$

    A) $1 + 11i$ B) $11 + 3i$ C) $11 - 3i$ D) $-11 + 3i$

    Objective: (1) Add and Subtract Complex Numbers

136) $(3 + 8i) - (-8 + i)$

    A) $-11 - 7i$ B) $11 + 7i$ C) $11 - 7i$ D) $-5 + 9i$

    Objective: (1) Add and Subtract Complex Numbers

137) 6i + (–5 – i)

    A) 5 – 5i   B) 5 – 7i   C) –5 + 5i   D) –5 + 7i

138) 7i – (–4 – i)

    A) 4 – 6i   B) –4 – 8i   C) 4 + 8i   D) –4 + 6i

139) (–8 + 3i) – 2

    A) –10 + 3i   B) 10 – 3i   C) –6 – 3i   D) –6 + 3i

140) –4 – (4 – 6i) – (3 – 7i)

    A) –7 + 13i   B) –7 – 13i   C) –11 – 13i   D) –11 + 13i

141) (–2 + 9i) + (6 + 7i) + (1 + 6i)

    A) 4 + 16i   B) 3 + 10i   C) –7 + 8i   D) 5 + 22i

Find the product and write the result in standard form.

142) –5i(8i – 5)

    A) 40 + 25i   B) 25i + 40i^2 C) –40 + 25i   D) 25i – 40i^2

143) 5i(–5i + 3)

    A) 15i – 25i^2 B) –25 + 15i   C) 25 + 15i   D) 15i + 25i^2

144) (9 + 4i)(2 – 8i)

    A) 50 – 64i   B) –32i^2 – 64i + 18   C) –14 + 80i   D) 50 + 64i

145) (–2 + 8i)(2 + i)

    A) 4 + 14i   B) 4 – 18i   C) –12 – 18i   D) –12 + 14i

146) (2 – 8i)(–3 – 6i)

    A) 42 – 36i   B) –54 – 36i   C) –54 + 12i   D) 42 + 12i

147) (1 + 5i)(1 – 5i)

    A) 1 – 25i^2 B) 26   C) 1 – 25i   D) –24

148) (–5 + i)(–5 – i)

    A) –5   B) 26   C) 25   D) –24

Objective: (2) Multiply Complex Numbers

149) $(1 - 9i)^2$

    A) –80 – 18i   B) $1 - 18i + 81i^2$ C) –80   D) 82 – 18i

Objective: (2) Multiply Complex Numbers

Perform the indicated operations and write the result in standard form.

150) (4 + 5i)(3 – i) – (2 – i)(2 + i)

    A) 12 + 11i   B) 22 + 11i   C) 12 + 19i   D) 14 + 11i

Objective: (2) Multiply Complex Numbers

151) $(4 + i)^2 - (3 - i)^2$

    A) 7 + 14i   B) –7   C) 7 – 14i   D) –7 + 14i

Objective: (2) Multiply Complex Numbers

Complex numbers are used in electronics to describe the current in an electric circuit. Ohm's law relates the current in a circuit, I, in amperes, the voltage of the circuit, E, in volts, and the resistance of the circuit, R, in ohms, by the formula E = IR. Solve the problem using this formula.

152) Find E, the voltage of a circuit, if I = (5 + 8i) amperes and R = (9 + 4i) ohms.

    A) (13 + 92i) volts   B) (92 + 13i) volts   C) (13 – 92i) volts   D) (92 – 13i) volts

Objective: (2) Multiply Complex Numbers

153) Find E, the voltage of a circuit, if I = (18 + i) amperes and R = (3 + 2i) ohms.

    A) (18 – 39i) volts   B) (52 + 39i) volts   C) (52 – 39i) volts   D) (18 + 39i) volts

Objective: (2) Multiply Complex Numbers

Divide and express the result in standard form.

154) $\dfrac{5}{9 - i}$

    A) $\dfrac{45}{82} - \dfrac{5}{82}i$ B) $\dfrac{45}{82} + \dfrac{5}{82}i$ C) $\dfrac{9}{16} + \dfrac{1}{16}i$ D) $\dfrac{9}{16} - \dfrac{1}{16}i$

Objective: (3) Divide Complex Numbers

155) $\dfrac{3}{7 + i}$

    A) $\dfrac{21}{50} + \dfrac{3}{50}i$ B) $\dfrac{7}{16} + \dfrac{1}{16}i$ C) $\dfrac{7}{16} - \dfrac{1}{16}i$ D) $\dfrac{21}{50} - \dfrac{3}{50}i$

Objective: (3) Divide Complex Numbers

156) $\dfrac{2i}{1 + i}$

    A) 1 + 2i   B) –1 + i   C) 1 – i   D) 1 + i

Objective: (3) Divide Complex Numbers

157) $\dfrac{2i}{4 - i}$

   A) $-\dfrac{2}{15} + \dfrac{8}{15}i$ B) $\dfrac{2}{17} + \dfrac{8}{17}i$ C) $-\dfrac{2}{17} + \dfrac{8}{17}i$ D) $-\dfrac{2}{17} - \dfrac{8}{17}i$

   Objective: (3) Divide Complex Numbers

158) $\dfrac{3i}{4 + 3i}$

   A) $\dfrac{9}{25} + \dfrac{12}{25}i$ B) $\dfrac{9}{7} - \dfrac{12}{7}i$ C) $\dfrac{12}{25} + \dfrac{9}{25}i$ D) $\dfrac{12}{7} + \dfrac{9}{7}i$

   Objective: (3) Divide Complex Numbers

159) $\dfrac{7 + 5i}{5 - 7i}$

   A) 1 B) -1 C) i D) $-i$

   Objective: (3) Divide Complex Numbers

160) $\dfrac{4 - 5i}{7 + 3i}$

   A) $\dfrac{13}{58} - \dfrac{47}{58}i$ B) $\dfrac{43}{40} - \dfrac{47}{40}i$ C) $\dfrac{13}{40} - \dfrac{47}{40}i$ D) $\dfrac{43}{58} + \dfrac{23}{58}i$

   Objective: (3) Divide Complex Numbers

161) $\dfrac{9 + 2i}{6 - 5i}$

   A) $\dfrac{64}{61} + \dfrac{33}{61}i$ B) $\dfrac{64}{11} + \dfrac{57}{11}i$ C) $4 + \dfrac{57}{11}i$ D) $\dfrac{44}{61} + \dfrac{57}{61}i$

   Objective: (3) Divide Complex Numbers

162) $\dfrac{6 + 3i}{5 + 2i}$

   A) $\dfrac{8}{7} + \dfrac{1}{7}i$ B) $\dfrac{36}{29} + \dfrac{3}{29}i$ C) $\dfrac{12}{7} + \dfrac{1}{7}i$ D) $\dfrac{24}{29} - \dfrac{27}{29}i$

   Objective: (3) Divide Complex Numbers

163) $\dfrac{4 + 8i}{8 + 6i}$

   A) $-\dfrac{4}{7} + \dfrac{1}{14}i$ B) $\dfrac{1}{7} + \dfrac{1}{14}i$ C) $\dfrac{4}{5} + \dfrac{2}{5}i$ D) $-\dfrac{16}{5} - \dfrac{88}{5}i$

   Objective: (3) Divide Complex Numbers

164) $\dfrac{5 - 7i}{5 - 6i}$

   A) $-\dfrac{17}{61} + \dfrac{65}{61}i$ B) $\dfrac{67}{61} - \dfrac{5}{61}i$ C) $-\dfrac{67}{11} + \dfrac{5}{11}i$ D) $\dfrac{17}{11} + \dfrac{5}{11}i$

   Objective: (3) Divide Complex Numbers

Perform the indicated operations and write the result in standard form.

165) $\sqrt{-36} + \sqrt{-64}$

    A) –14   B) 14i   C) 48i   D) –14i

166) $\sqrt{-7} - \sqrt{-144}$

    A) $\sqrt{7}i - 12$ B) $\sqrt{7}i - 12i$ C) $i(\sqrt{7} + 12)$ D) $i(\sqrt{7} - 12)$

167) $2\sqrt{-9} + 3\sqrt{-81}$

    A) –33   B) 33i   C) –33i   D) 33

168) $5\sqrt{-32} + 2\sqrt{-50}$

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

169) $(-3 - \sqrt{-49})^2$

    A) 9 – 49i   B) 58 – 42i   C) –40 + 42i   D) 9 + 49i

170) $(-4 + \sqrt{-100})^2$

    A) 116 – 80i   B) 16 – 100i   C) 16 + 100i   D) –84 – 80i

171) $(\sqrt{3} - \sqrt{-36})(\sqrt{3} + \sqrt{-36})$

    A) –33   B) 39   C) 3 + 6i   D) 3 – 36i

172) $(4 + \sqrt{-2})(2 + \sqrt{-7})$

    A) $(8 - \sqrt{14}) + (4\sqrt{7} + 2\sqrt{2})i$ B) $-6 - 6\sqrt{14}i$

    C) $(8 + \sqrt{14}) - 22i$ D) 22 + 84i

173) $\dfrac{-21 + \sqrt{-18}}{3}$

    A) $-7 - i\sqrt{2}$ B) $-7 + i\sqrt{3}$ C) $7 + i\sqrt{2}$ D) $-7 + i\sqrt{2}$

174) $\dfrac{-4 - \sqrt{-20}}{2}$

    A) $-2 - i\sqrt{2}$ B) $-2 - i\sqrt{5}$ C) $-2 + i\sqrt{5}$ D) $2 + i\sqrt{5}$

175) $\sqrt{-36}(6 - \sqrt{-25})$

    A) 30 + 36i   B) $36i + 30i^2$ C) 36i – 30   D) $36i - 30i^2$

    Objective: (4) Perform Operations with Square Roots of Negative Numbers

176) $(\sqrt{-4})(\sqrt{-25})$

    A) 10   B) $10i^2$ C) –10i   D) –10

    Objective: (4) Perform Operations with Square Roots of Negative Numbers

Solve the equation by factoring.

177) $x^2 = x + 6$

    A) {1, 6}   B) {2, 3}   C) {–2, –3}   D) {–2, 3}

    Objective: (1) Solve Quadratic Equations by Factoring

178) $x^2 + 9x - 22 = 0$

    A) {11, –2}   B) {–11, 2}   C) {11, 2}   D) {–11, 1}

    Objective: (1) Solve Quadratic Equations by Factoring

179) $6x^2 + 19x + 15 = 0$

    A) $\left\{-\frac{5}{6}, -\frac{1}{5}\right\}$ B) $\left\{-\frac{5}{3}, -\frac{3}{2}\right\}$ C) $\left\{\frac{5}{3}, \frac{3}{2}\right\}$ D) $\left\{\frac{5}{3}, -\frac{3}{2}\right\}$

    Objective: (1) Solve Quadratic Equations by Factoring

180) $5x^2 - 9x = 2$

    A) $\left\{\frac{1}{9}, -\frac{1}{5}\right\}$ B) $\left\{-\frac{1}{5}, 5\right\}$ C) {–5, 2}   D) $\left\{-\frac{1}{5}, 2\right\}$

    Objective: (1) Solve Quadratic Equations by Factoring

181) $2x^2 - 11x = 0$

    A) $\left\{0, \frac{11}{2}\right\}$ B) $\left\{-\frac{11}{2}, 0\right\}$ C) {0}   D) $\left\{\frac{11}{2}, -\frac{11}{2}\right\}$

    Objective: (1) Solve Quadratic Equations by Factoring

182) $3x(x - 1) = 5x^2 - 4x$

    A) $\left\{-\frac{1}{2}, 0\right\}$ B) {0}   C) $\left\{0, \frac{1}{2}\right\}$ D) {0, 2}

    Objective: (1) Solve Quadratic Equations by Factoring

183) $7 - 7x = (4x + 9)(x - 1)$

    A) $\left\{1, -\frac{9}{4}\right\}$ B) {–1, 4}   C) {–4, 1}   D) {1}

    Objective: (1) Solve Quadratic Equations by Factoring

184) $-6x - 2 = (3x + 1)^2$

    A) $\left\{-1, -\frac{1}{3}\right\}$ B) $\left\{-\frac{1}{3}\right\}$ C) $\varnothing$ D) $\left\{\frac{1}{3}, 1\right\}$

    Objective: (1) Solve Quadratic Equations by Factoring

Solve the equation by the square root property.

185) $3x^2 = 12$

    A) $\{0\}$ B) $\{-2, 2\}$ C) $\{-3, 3\}$ D) $\{-2\sqrt{3}, 2\sqrt{3}\}$

186) $3x^2 = 33$

    A) $\{-11, 11\}$ B) $\{-\sqrt{11}, \sqrt{11}\}$ C) $\{16.5\}$ D) $\{12\}$

187) $3x^2 + 2 = 677$

    A) $\{-16, 16\}$ B) $\{338.5\}$ C) $\{-15, 15\}$ D) $\{15\}$

188) $(x - 5)^2 = 16$

    A) $\{-4, 4\}$ B) $\{1, 9\}$ C) $\{-9, 1\}$ D) $\{21\}$

189) $(2x - 1)^2 = 81$

    A) $\{-8, 10\}$ B) $\{-4, 5\}$ C) $\{-5, 4\}$ D) $\{-10, 8\}$

190) $(4x + 2)^2 = 36$

    A) $\{-10, 10\}$ B) $\{1, 2\}$ C) $\{0, 1\}$ D) $\{-2, 1\}$

191) $5(x - 3)^2 = 30$

    A) $\{-3 \pm \sqrt{6}\}$ B) $\{3 \pm \sqrt{6}\}$ C) $\{-9, 3\}$ D) $\{-3, 9\}$

192) $(4x + 3)^2 = 7$

    A) $\left\{ \dfrac{3 - \sqrt{7}}{4}, \dfrac{3 + \sqrt{7}}{4} \right\}$ B) $\left\{ -\dfrac{5}{2}, 1 \right\}$

    C) $\left\{ \dfrac{\sqrt{7} - 3}{4}, \dfrac{\sqrt{7} + 3}{4} \right\}$ D) $\left\{ \dfrac{-3 - \sqrt{7}}{4}, \dfrac{-3 + \sqrt{7}}{4} \right\}$

193) $(11x - 6)^2 = 8$

    A) $\{-2\sqrt{11}, 2\sqrt{11}\}$ B) $\left\{ \dfrac{6 - 2\sqrt{2}}{11}, \dfrac{6 + 2\sqrt{2}}{11} \right\}$

    C) $\left\{ -\dfrac{2}{11}, \dfrac{14}{11} \right\}$ D) $\left\{ \dfrac{-6 - 2\sqrt{2}}{11}, \dfrac{-6 + 2\sqrt{2}}{11} \right\}$

194) $(x - 7)^2 = -81$

    A) $\{-7 \pm 9i\}$ B) $\{7i \pm 9\}$ C) $\{7 \pm 9i\}$ D) $\left\{\pm \dfrac{9i}{7}\right\}$

195) $(x - 9)^2 = -7$

    A) $\{9 \pm \sqrt{7}\}$ B) $\{2, 16\}$ C) $\{9 \pm i\sqrt{7}\}$ D) $\{-9 \pm 7i\}$

Determine the constant that should be added to the binomial so that it becomes a perfect square trinomial. Then write and factor the trinomial.

196) $x^2 + 6x$

    A) $36; x^2 + 6x + 36 = (x + 6)^2$ B) $9; x^2 + 6x + 9 = (x + 3)^2$

    C) $3; x^2 + 6x + 3 = (x + 9)^2$ D) $6; x^2 + 6x + 6 = (x + 36)^2$

197) $x^2 - 4x$

    A) $16; x^2 - 4x + 16 = (x - 4)^2$ B) $-4; x^2 - 4x - 4 = (x - 2)^2$

    C) $4; x^2 - 4x + 4 = (x - 2)^2$ D) $-16; x^2 - 4x - 16 = (x - 4)^2$

198) $x^2 - 7x$

    A) $\dfrac{7}{2}; x^2 - 7x + \dfrac{7}{2} = \left(x - \dfrac{7}{2}\right)^2$ B) $-\dfrac{49}{4}; x^2 - 7x - \dfrac{49}{4} = \left(x - \dfrac{7}{2}\right)^2$

    C) $\dfrac{49}{4}; x^2 - 7x + \dfrac{49}{4} = \left(x - \dfrac{7}{2}\right)^2$ D) $49; x^2 - 7x + 49 = (x - 7)^2$

199) $x^2 + \dfrac{1}{6}x$

    A) $\dfrac{1}{12}; x^2 + \dfrac{1}{6}x + \dfrac{1}{12} = \left(x + \dfrac{1}{6}\right)^2$ B) $\dfrac{1}{36}; x^2 + \dfrac{1}{6}x + \dfrac{1}{36} = \left(x + \dfrac{1}{6}\right)^2$

    C) $\dfrac{1}{144}; x^2 + \dfrac{1}{6}x + \dfrac{1}{144} = \left(x + \dfrac{1}{12}\right)^2$ D) $144; x^2 + \dfrac{1}{6}x + 144 = (x + 12)^2$

200) $x^2 + \dfrac{4}{9}x$

    A) $\dfrac{8}{81}; x^2 + \dfrac{4}{9}x + \dfrac{8}{81} = \left(x + \dfrac{4}{9}\right)^2$ B) $\dfrac{2}{81}; x^2 + \dfrac{4}{9}x + \dfrac{2}{81} = \left(x + \dfrac{2}{9}\right)^2$

    C) $\dfrac{4}{9}; x^2 + \dfrac{4}{9}x + \dfrac{4}{9} = \left(x + \dfrac{2}{9}\right)^2$ D) $\dfrac{4}{81}; x^2 + \dfrac{4}{9}x + \dfrac{4}{81} = \left(x + \dfrac{2}{9}\right)^2$

201) $x^2 - \dfrac{2}{3}x$

A) $\dfrac{4}{9}$; $x^2 - \dfrac{2}{3}x + \dfrac{4}{9} = \left(x - \dfrac{2}{3}\right)^2$

B) $\dfrac{1}{9}$; $x^2 - \dfrac{2}{3}x + \dfrac{1}{9} = \left(x + \dfrac{1}{3}\right)^2$

C) $\dfrac{2}{9}$; $x^2 - \dfrac{2}{3}x + \dfrac{2}{9} = \left(x - \dfrac{1}{3}\right)^2$

D) $\dfrac{1}{9}$; $x^2 - \dfrac{2}{3}x + \dfrac{1}{9} = \left(x - \dfrac{1}{3}\right)^2$

Objective: (3) Solve Quadratic Equations by Completing the Square

Solve the equation by completing the square.

202) $x^2 + 8x = 3$

A) $\{4 + \sqrt{9.5}\}$

B) $\{-4 - \sqrt{9.5}, -4 + \sqrt{9.5}\}$

C) $\{-4 - 1\sqrt{9.5}, -4 + 1\sqrt{9.5}\}$

D) $\{-1 - \sqrt{9.5}, -1 + \sqrt{9.5}\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

203) $x^2 + 10x + 21 = 0$

A) $\{3, 7\}$
B) $\{-\sqrt{21}, \sqrt{21}\}$
C) $\{-7, 28\}$
D) $\{-7, -3\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

204) $x^2 + 12x + 22 = 0$

A) $\{-12 + \sqrt{22}\}$

B) $\{-6 - \sqrt{14}, -6 + \sqrt{14}\}$

C) $\{6 + \sqrt{14}\}$

D) $\{6 - \sqrt{22}, 6 + \sqrt{22}\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

205) $x^2 + 6x - 5 = 0$

A) $\{-3 - \sqrt{14}, -3 + \sqrt{14}\}$

B) $\{3 + \sqrt{14}\}$

C) $\{-3 - 1\sqrt{14}, -3 + 1\sqrt{14}\}$

D) $\{-1 - \sqrt{14}, -1 + \sqrt{14}\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

206) $x^2 - 8x - 13 = 0$

A) $\{8 - \sqrt{77}, 8 + \sqrt{77}\}$

B) $\{-4 - \sqrt{29}, -4 + \sqrt{29}\}$

C) $\{4 - \sqrt{29}, 4 + \sqrt{29}\}$

D) $\{4 - \sqrt{13}, 4 + \sqrt{13}\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

207) $x^2 + 3x - 9 = 0$

A) $\left\{\dfrac{-3 - 3\sqrt{5}}{2}\right\}$

B) $\{-3 - 3\sqrt{5}, -3 + 3\sqrt{5}\}$

C) $\left\{\dfrac{3 + 3\sqrt{5}}{2}\right\}$

D) $\left\{\dfrac{-3 - 3\sqrt{5}}{2}, \dfrac{-3 + 3\sqrt{5}}{2}\right\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

208) $x^2 - 8x + 32 = 0$

A) $\{4 \pm 4i\}$
B) $\{4 \pm 16i\}$
C) $\{8, 0\}$
D) $\{4 + 4i\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

209) $x^2 + x + 2 = 0$

    A) $\left\{\dfrac{1 \pm i\sqrt{7}}{2}\right\}$
    B) $\left\{\dfrac{-1 \pm \sqrt{7}}{2}\right\}$
    C) $\left\{\dfrac{-1 \pm i\sqrt{7}}{2}\right\}$
    D) $\left\{\dfrac{1 \pm \sqrt{7}}{2}\right\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

210) $7x^2 - 2x - 3 = 0$

    A) $\left\{-3, \dfrac{23}{7}\right\}$
    B) $\left\{\dfrac{7 - \sqrt{22}}{49}, \dfrac{7 + \sqrt{22}}{49}\right\}$

    C) $\left\{\dfrac{-1 - \sqrt{22}}{7}, \dfrac{-1 + \sqrt{22}}{7}\right\}$
    D) $\left\{\dfrac{1 - \sqrt{22}}{7}, \dfrac{1 + \sqrt{22}}{7}\right\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

211) $16x^2 - 3x + 1 = 0$

    A) $\left\{\dfrac{3 - i\sqrt{55}}{32}, \dfrac{-3 + i\sqrt{55}}{32}\right\}$
    B) $\left\{\dfrac{-3 \pm i\sqrt{55}}{32}\right\}$

    C) $\left\{\dfrac{3 \pm \sqrt{55}}{32}\right\}$
    D) $\left\{\dfrac{3 \pm i\sqrt{55}}{32}\right\}$

Objective: (3) Solve Quadratic Equations by Completing the Square

Solve the equation using the quadratic formula.

212) $x^2 + 10x - 24 = 0$

    A) {−12, 1}
    B) {−2, 12}
    C) {−12, 2}
    D) {12, 2}

Objective: (4) Solve Quadratic Equations Using the Quadratic Formula

213) $x^2 + 5x + 5 = 0$

    A) $\left\{\dfrac{5 - \sqrt{5}}{2}, \dfrac{5 + \sqrt{5}}{2}\right\}$
    B) $\left\{\dfrac{-5 - 3\sqrt{5}}{2}, \dfrac{-5 + 3\sqrt{5}}{2}\right\}$

    C) $\left\{\dfrac{-5 - \sqrt{5}}{10}, \dfrac{-5 + \sqrt{5}}{10}\right\}$
    D) $\left\{\dfrac{-5 - \sqrt{5}}{2}, \dfrac{-5 + \sqrt{5}}{2}\right\}$

Objective: (4) Solve Quadratic Equations Using the Quadratic Formula

214) $5x^2 + 12x + 6 = 0$

    A) $\left\{\dfrac{-6 - \sqrt{6}}{5}, \dfrac{-6 + \sqrt{6}}{5}\right\}$
    B) $\left\{\dfrac{-6 - \sqrt{66}}{5}, \dfrac{-6 + \sqrt{66}}{5}\right\}$

    C) $\left\{\dfrac{-6 - \sqrt{6}}{10}, \dfrac{-6 + \sqrt{6}}{10}\right\}$
    D) $\left\{\dfrac{-12 - \sqrt{6}}{5}, \dfrac{-12 + \sqrt{6}}{5}\right\}$

Objective: (4) Solve Quadratic Equations Using the Quadratic Formula

215) $4x^2 + x - 6 = 0$

    A) $\varnothing$
    B) $\left\{\dfrac{1 - \sqrt{97}}{8}, \dfrac{1 + \sqrt{97}}{8}\right\}$

    C) $\left\{\dfrac{-1 - \sqrt{97}}{2}, \dfrac{-1 + \sqrt{97}}{2}\right\}$
    D) $\left\{\dfrac{-1 - \sqrt{97}}{8}, \dfrac{-1 + \sqrt{97}}{8}\right\}$

Objective: (4) Solve Quadratic Equations Using the Quadratic Formula

216) $6x^2 = -12x - 5$

A) $\left\{\dfrac{-6 - \sqrt{6}}{6}, \dfrac{-6 + \sqrt{6}}{6}\right\}$

B) $\left\{\dfrac{-6 - \sqrt{6}}{12}, \dfrac{-6 + \sqrt{6}}{12}\right\}$

C) $\left\{\dfrac{-6 - \sqrt{66}}{6}, \dfrac{-6 + \sqrt{66}}{6}\right\}$

D) $\left\{\dfrac{-12 - \sqrt{6}}{6}, \dfrac{-12 + \sqrt{6}}{6}\right\}$

217) $x^2 + 4x + 13 = 0$

A) $\{-2 + 3i, -2 - 3i\}$ B) $\{-2 + 3i\}$ C) $\{-2 - 9i, -2 + 9i\}$ D) $\{1, -5\}$

218) $6x^2 - 5x + 5 = 0$

A) $\left\{\dfrac{-5 \pm i\sqrt{95}}{12}\right\}$ B) $\left\{\dfrac{5 \pm \sqrt{95}}{12}\right\}$ C) $\left\{\dfrac{-5 \pm \sqrt{95}}{12}\right\}$ D) $\left\{\dfrac{5 \pm i\sqrt{95}}{12}\right\}$

219) $16x^2 + 1 = 3x$

A) $\left\{\dfrac{-3 \pm i\sqrt{55}}{32}\right\}$ B) $\left\{\dfrac{3 \pm i\sqrt{55}}{32}\right\}$ C) $\left\{\dfrac{-3 \pm \sqrt{55}}{32}\right\}$ D) $\left\{\dfrac{3 \pm \sqrt{55}}{32}\right\}$

Compute the discriminant. Then determine the number and type of solutions for the given equation.

220) $x^2 - 6x + 5 = 0$

    A) 16; two unequal real solutions
    B) 0; one real solution
    C) -56; two complex imaginary solutions

221) $x^2 - 12x + 36 = 0$

    A) -144; two complex imaginary solutions
    B) 144; two unequal real solutions
    C) 0; one real solution

222) $8x^2 = 2x - 1$

    A) 36; two unequal real solutions
    B) 0; one real solution
    C) -28; two complex imaginary solutions

Solve the equation by the method of your choice.

223) $(5x + 9)^2 = 49$

A) $\left\{-\dfrac{2}{5}, 0\right\}$ B) $\left\{\dfrac{2}{5}, \dfrac{16}{5}\right\}$ C) $\left\{-\dfrac{16}{5}, -\dfrac{2}{5}\right\}$ D) $\left\{\dfrac{40}{5}\right\}$

224) $8x^2 - 47x - 6 = 0$

    A) $\left\{ -\dfrac{1}{8}, \dfrac{1}{47} \right\}$ B) $\{-8, 6\}$ C) $\left\{ -\dfrac{1}{8}, 8 \right\}$ D) $\left\{ -\dfrac{1}{8}, 6 \right\}$
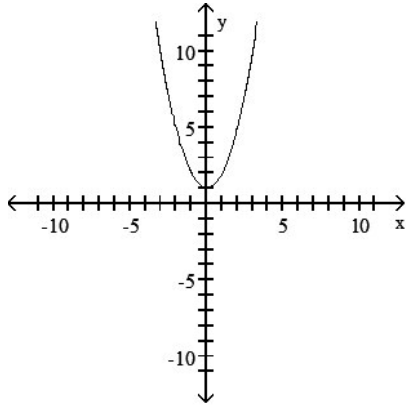
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

225) $5x^2 + 12x = -6$

   A) $\left\{ \dfrac{-12 - \sqrt{6}}{5}, \dfrac{-12 + \sqrt{6}}{5} \right\}$ B) $\left\{ \dfrac{-6 - \sqrt{66}}{5}, \dfrac{-6 + \sqrt{66}}{5} \right\}$

    C) $\left\{ \dfrac{-6 - \sqrt{6}}{5}, \dfrac{-6 + \sqrt{6}}{5} \right\}$ D) $\left\{ \dfrac{-6 - \sqrt{6}}{10}, \dfrac{-6 + \sqrt{6}}{10} \right\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

226) $2x^2 = -10x - 4$

    A) $\left\{ \dfrac{-5 - \sqrt{17}}{2}, \dfrac{-5 + \sqrt{17}}{2} \right\}$ B) $\left\{ \dfrac{-10 - \sqrt{17}}{2}, \dfrac{-10 + \sqrt{17}}{2} \right\}$

    C) $\left\{ \dfrac{-5 - \sqrt{17}}{4}, \dfrac{-5 + \sqrt{17}}{4} \right\}$ D) $\left\{ \dfrac{-5 - \sqrt{33}}{2}, \dfrac{-5 + \sqrt{33}}{2} \right\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

227) $5x^2 + 8x + 1 = 0$

    A) $\left\{ \dfrac{-4 - \sqrt{21}}{5}, \dfrac{-4 + \sqrt{21}}{5} \right\}$ B) $\left\{ \dfrac{-4 - \sqrt{11}}{10}, \dfrac{-4 + \sqrt{11}}{10} \right\}$

    C) $\left\{ \dfrac{-8 - \sqrt{11}}{5}, \dfrac{-8 + \sqrt{11}}{5} \right\}$ D) $\left\{ \dfrac{-4 - \sqrt{11}}{5}, \dfrac{-4 + \sqrt{11}}{5} \right\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

228) $2x^2 = 26$

    A) $\{-13, 13\}$ B) $\{-\sqrt{13}, \sqrt{13}\}$ C) $\{13\}$ D) $\{14\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

229) $5x^2 - 35 = 0$

    A) $\left\{ -\dfrac{\sqrt{35}}{5}, \dfrac{\sqrt{35}}{5} \right\}$ B) $\{\sqrt{7}\}$ C) $\{-\sqrt{7}, \sqrt{7}\}$ D) $\{-\sqrt{35}, \sqrt{35}\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

230) $x^2 + 10x + 6 = 0$

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

    C) $\{5 + \sqrt{19}\}$ D) $\{-5 - \sqrt{19}, -5 + \sqrt{19}\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

231) $2x^2 + 16x + 40 = 0$

    A) $\{-4 - 4i, -4 + 4i\}$ B) $\{-2, -6\}$ C) $\{-4 + 2i\}$ D) $\{-4 + 2i, -4 - 2i\}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

232) $(4x + 3)^2 = 7$

A) $\left\{-\dfrac{5}{2}, 1\right\}$ B) $\left\{\dfrac{3 \pm \sqrt{7}}{4}\right\}$ C) $\left\{\dfrac{\sqrt{7} \pm 3}{4}\right\}$ D) $\left\{\dfrac{-3 \pm \sqrt{7}}{4}\right\}$

233) $(x + 4)(x - 9) = 8$

A) $\left\{\dfrac{5 \pm \sqrt{201}}{2}\right\}$ B) $\left\{\dfrac{-5 \pm i\sqrt{201}}{2}\right\}$ C) $\left\{\dfrac{5 \pm i\sqrt{201}}{2}\right\}$ D) $\left\{\dfrac{-5 \pm \sqrt{201}}{2}\right\}$

234) $\dfrac{x^2}{10} + x + \dfrac{3}{2} = 0$

A) $\{5 \pm \sqrt{15}\}$ B) $\{5 + \sqrt{10}\}$ C) $\{-5 \pm \sqrt{10}\}$ D) $\{-10 + \sqrt{15}\}$

235) $\dfrac{1}{x + 3} + \dfrac{1}{x} = \dfrac{1}{6}$

A) $\left\{\dfrac{9 \pm 3\sqrt{17}}{2}\right\}$ B) $\left\{\dfrac{-9 \pm 3\sqrt{17}}{2}\right\}$ C) $\left\{\dfrac{-15 \pm 3\sqrt{17}}{2}\right\}$ D) $\left\{\dfrac{15 \pm 3\sqrt{17}}{2}\right\}$

236) $\dfrac{2x}{x - 5} - \dfrac{x}{x - 6} = \dfrac{5}{x^2 - 11x + 30}$

A) $\left\{\dfrac{7 \pm \sqrt{69}}{2}\right\}$ B) $\left\{\dfrac{-7 \pm \sqrt{29}}{2}\right\}$ C) $\left\{\dfrac{-7 \pm \sqrt{69}}{2}\right\}$ D) $\left\{\dfrac{7 \pm \sqrt{29}}{2}\right\}$

237) $2x^2 - \sqrt{5}x - 1 = 0$

A) $\left\{\dfrac{\sqrt{5} \pm \sqrt{13}}{4}\right\}$ B) $\left\{\dfrac{\sqrt{5} \pm i\sqrt{3}}{4}\right\}$ C) $\left\{\dfrac{\sqrt{5} \pm \sqrt{33}}{4}\right\}$ D) $\left\{\dfrac{-\sqrt{5} \pm \sqrt{13}}{4}\right\}$

Find the x-intercept(s) of the graph of the equation. Graph the equation.

238) $y = x^2 + 7x + 10$
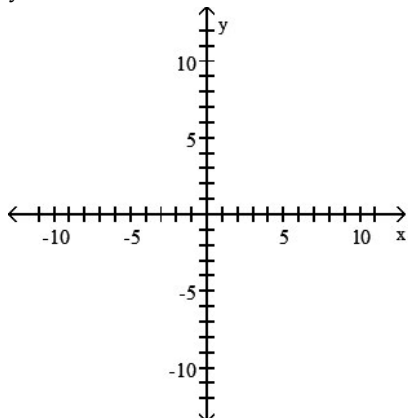
A) x-intercepts: 2 and 5
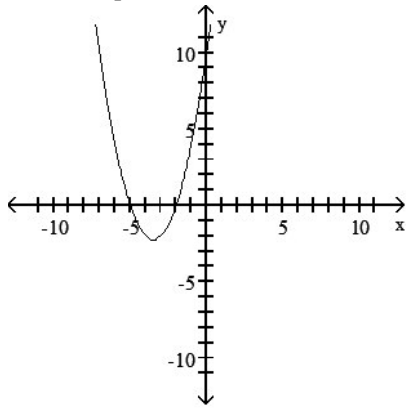
B) x-intercepts: –2 and –5
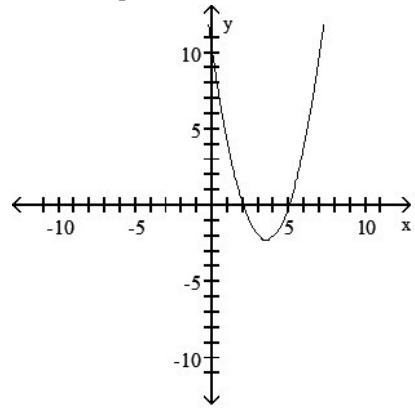
C) x-intercepts: –2 and –5
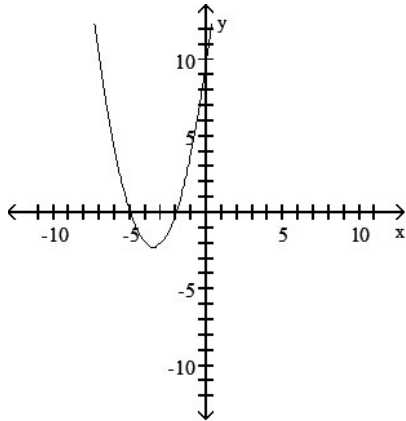
D) x-intercepts: 2 and 5
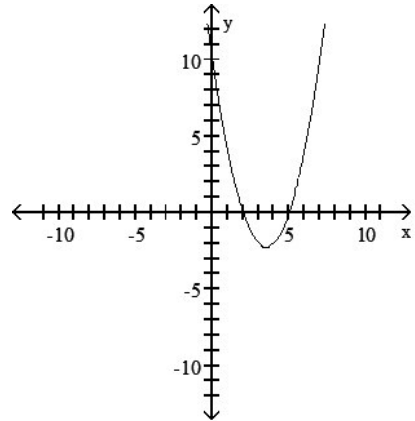
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

239) $y = x^2 + 4x + 4$
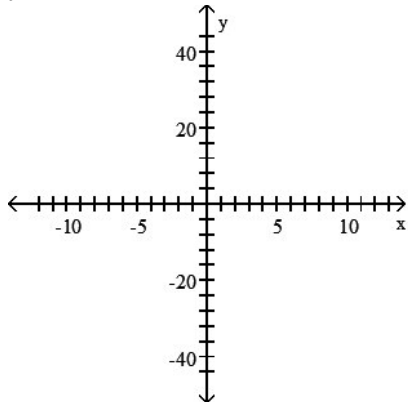
A) x-intercept: –2
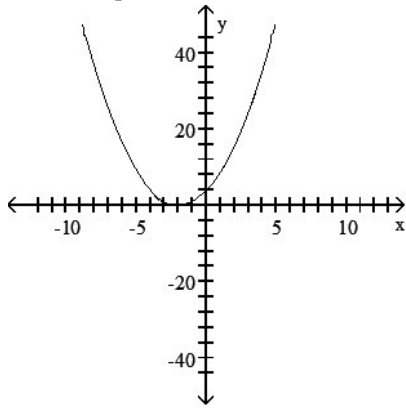
B) x-intercept: 2
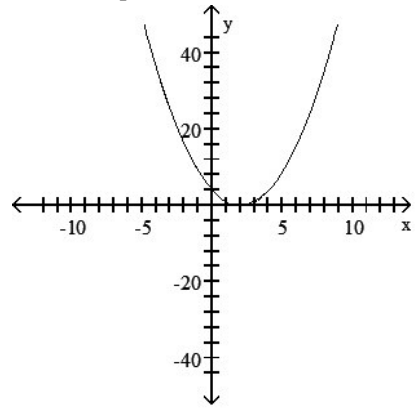
C) x-intercept: none
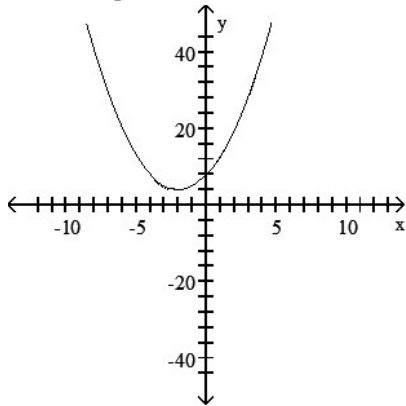
D) x-intercept: 8
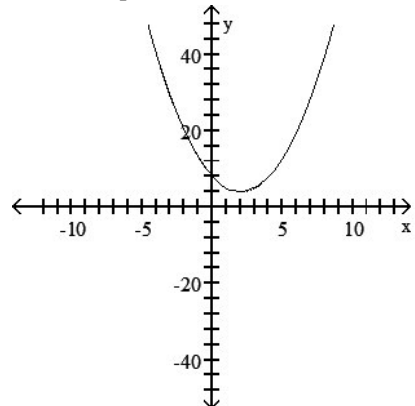
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

240) $y = x^2 + 4x - 7$
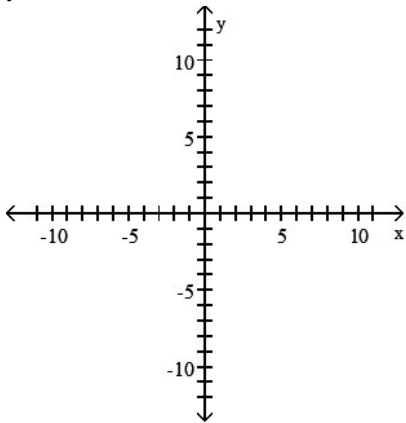
A) x–intercepts: none
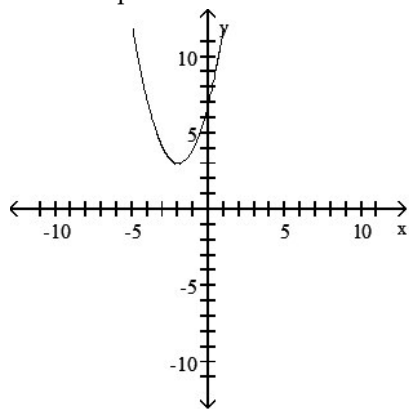
B) x–intercept: 4
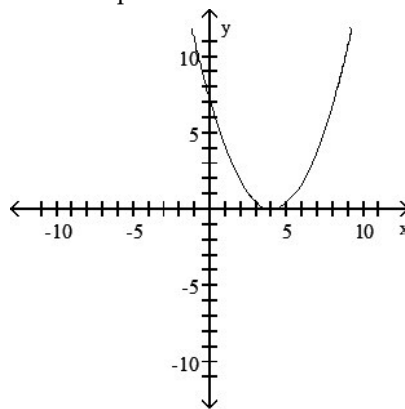
C) x–intercepts: $-2 \pm \sqrt{11}$
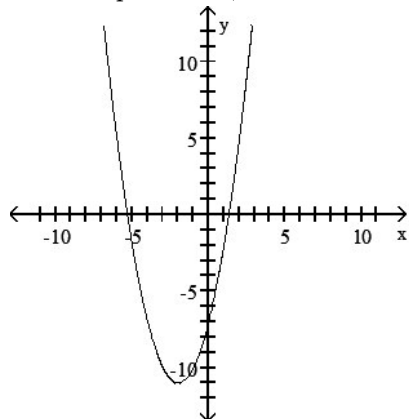
D) x–intercepts: –4 and 3
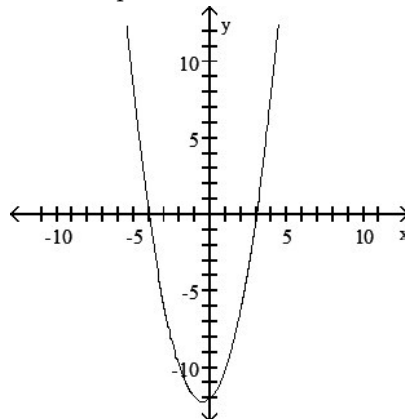
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

241) $y = x^2 - 5x + 1$

53
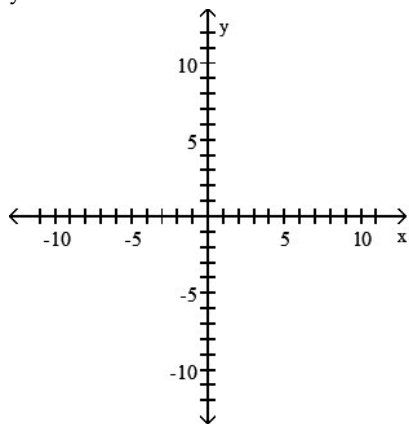
A) x-intercepts: none

B) x-intercepts: $\dfrac{5 \pm \sqrt{21}}{2}$
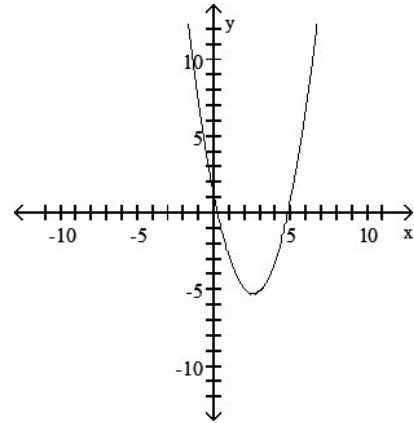
C) x-intercepts: –1 and 5
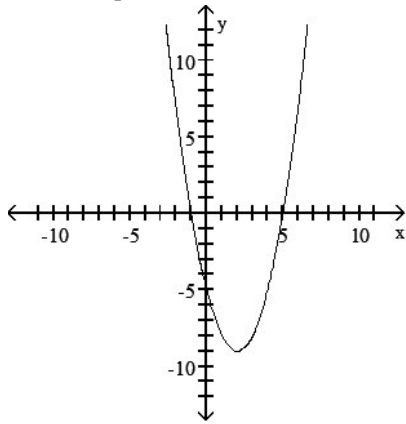
D) x-intercepts: $\dfrac{-5 \pm \sqrt{21}}{2}$
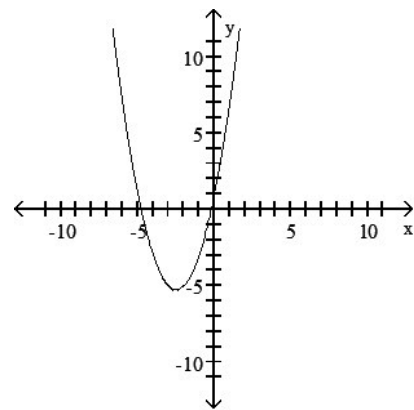
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

242) $y = -x^2 + 2x + 8$
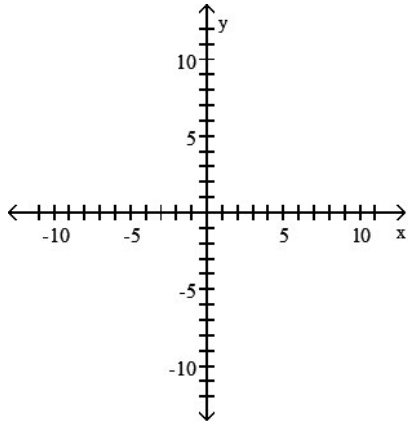
A) x-intercepts: −2 and 4
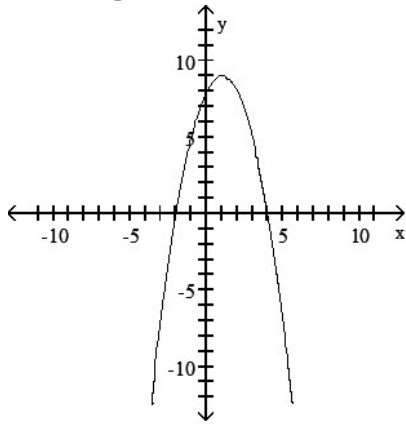
B) x-intercepts: −2 and 4
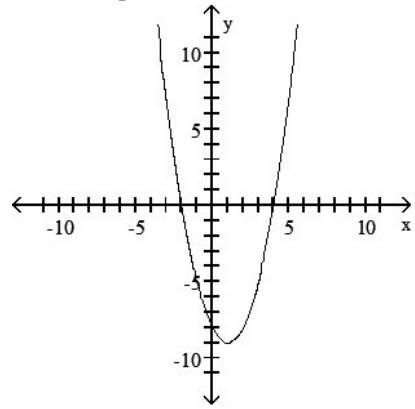
C) x-intercepts: −4 and 2
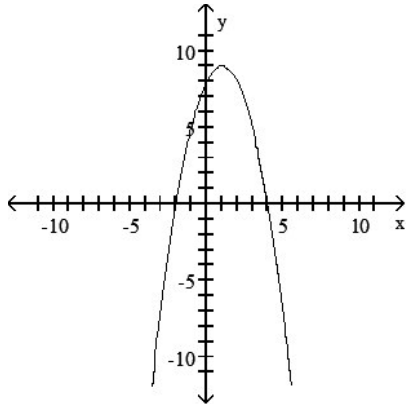
D) x-intercepts: −4 and 2
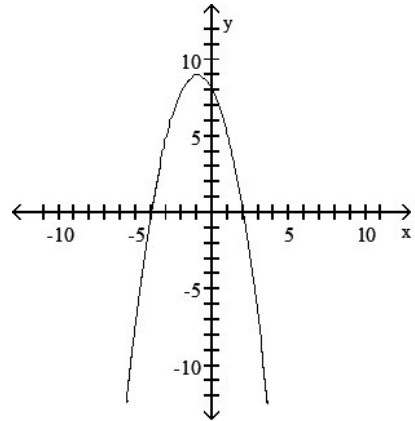
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

243) $y = -4x^2 - 32x - 65$
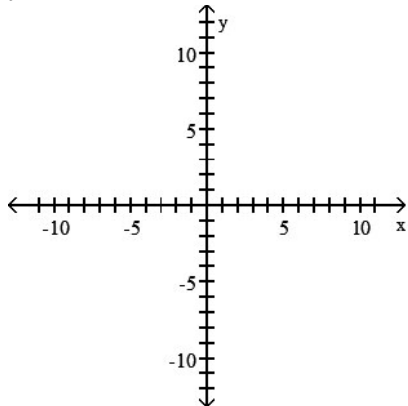
A) x–intercepts: none
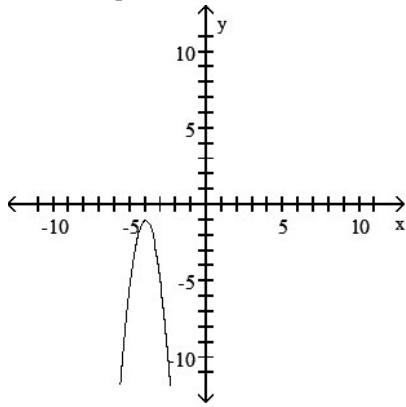
B) x–intercepts: none
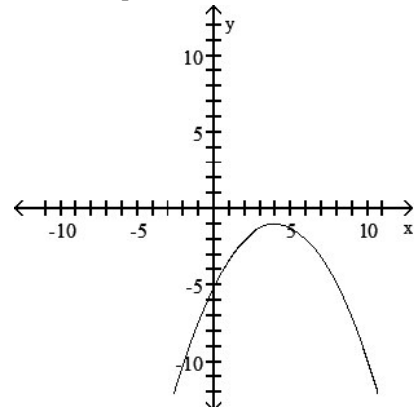
C) x–intercepts: none
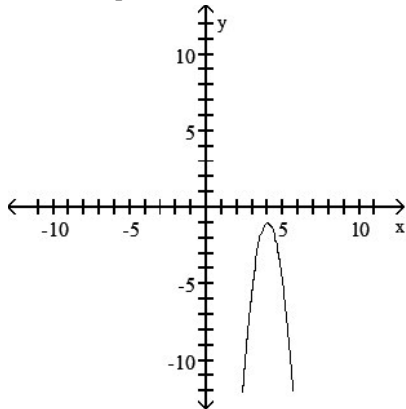
D) x–intercepts: none
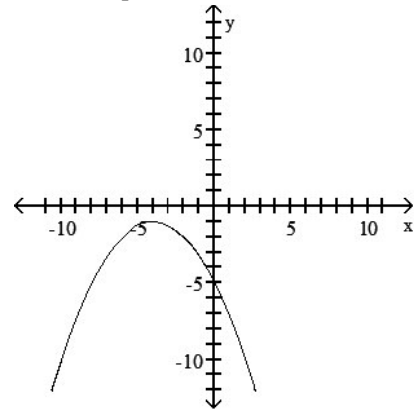
Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

Find all values of x satisfying the given conditions.

244) $y = x^2 + 8x$ and $y = 12$

A) $-4 \pm 2\sqrt{7}$ 　　　　B) $\pm 2\sqrt{7}$ 　　　　C) $-4 \pm 2\sqrt{14}$ 　　　　D) $2\sqrt{7} \pm 4$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

245) $y = 4x^2 - 31x - 8$ and $y = 0$

A) $-\dfrac{1}{4}, 4$ 　　　　B) $-\dfrac{1}{4}, 8$ 　　　　C) $\dfrac{1}{31}, -\dfrac{1}{4}$ 　　　　D) $-4, 8$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

246) $y_1 = (x + 7)$, $y_2 = (x - 4)$, and $y_1 y_2 = 2$

A) $\dfrac{-3 \pm i\sqrt{129}}{2}$ 　　　B) $\dfrac{-3 \pm \sqrt{129}}{2}$ 　　　C) $\dfrac{3 \pm \sqrt{129}}{2}$ 　　　D) $\dfrac{3 \pm i\sqrt{129}}{2}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

247) $y_1 = \dfrac{1}{x+9}$, $y_2 = \dfrac{1}{x}$, and $y_1 + y_2 = \dfrac{1}{3}$

A) $\dfrac{-3 \pm 3\sqrt{13}}{2}$ 　　　B) $\dfrac{-15 \pm 3\sqrt{13}}{2}$ 　　　C) $\dfrac{3 \pm 3\sqrt{13}}{2}$ 　　　D) $\dfrac{15 \pm 3\sqrt{13}}{2}$

Objective: (6) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

248) $y_1 = 7 - 7x$, $y_2 = (4x + 9)(x - 1)$, and $y_1 - y_2 = 0$

A) $1, -\dfrac{9}{4}$ B) $-4, 1$ C) $-1, 4$ D) 1

Solve the problem.

249) The formula $N = 4x^2 + 5x + 1$ represents the number of households N, in thousands, in a certain city that have a computer x years after 1990. According to the formula, in what year were there 85 thousand households with computers in this city?

A) 1,995   B) 1,992   C) 1,994   D) 1,993

250) The formula $P = 0.63x^2 - 0.043x + 2$ models the approximate population P, in thousands, for a species of fish in a local pond, x years after 1997. During what year will the population reach 52,643 fish?

A) 2,005   B) 2,006   C) 2,007   D) 2,008

251) The revenue for a small company is given by the quadratic function $r(t) = 7t^2 + 6t + 370$ where t is the number of years since 1998 and r(t) is in thousands of dollars. If this trend continues, find the year after 1998 in which the company's revenue will be $506 thousand. Round to the nearest whole year.

A) 2004   B) 2002   C) 2006   D) 2003

252) A square sheet of paper measures 47 centimeters on each side. What is the length of the diagonal of this paper?

A) 47 cm   B) 4,418 cm   C) $47\sqrt{2}$ cm   D) 94 cm

253) A ladder that is 13 feet long is 5 feet from the base of a wall. How far up the wall does the ladder reach?

A) $\sqrt{194}$ ft   B) $2\sqrt{2}$ ft   C) 144 ft   D) 12 ft

254) A 15-foot pole is supported by two wires that extend from the top of the pole to points that are each 15 feet from the base of the pole. Find the total length of the two wires.

A) 900 ft   B) $30\sqrt{2}$ ft   C) 60 ft   D) $15\sqrt{2}$ ft

255) The length of a rectangular storage room is 2 feet longer than its width. If the area of the room is 168 square feet, find its dimensions.

A) 11 feet by 13 feet   B) 12 feet by 14 feet   C) 11 feet by 15 feet   D) 13 feet by 15 feet

256) A machine produces open boxes using square sheets of plastic. The machine cuts equal-sized squares measuring 4 inches on a side from each corner of the sheet, and then shapes the plastic into an open box by turning up the sides. If each box must have a volume of 1,600 cubic inches, find the length of one side of the open box.

A) 28 in.   B) 19 in.   C) 24 in.   D) 20 in.

257) Suppose that an open box is to be made from a square sheet of cardboard by cutting out 3–inch squares from each corner as shown and then folding along the dotted lines. If the box is to have a volume of 12 cubic inches, find the original dimensions of the sheet of cardboard.
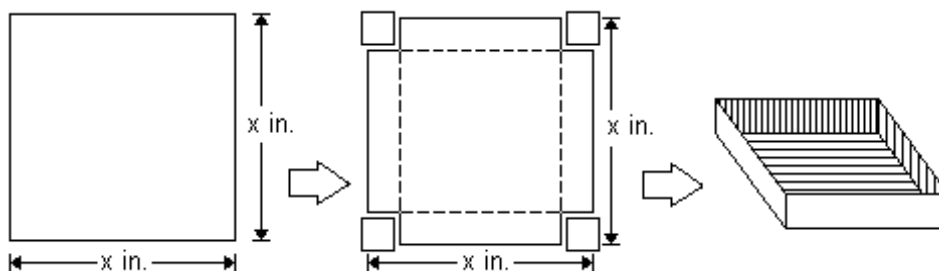
A) $2\sqrt{3}$ in. by $2\sqrt{3}$ in.   B) $\sqrt{2}$ in. by $\sqrt{6}$ in.   C) 8 in. by 8 in.   D) 2 in. by 2 in.

Objective: (7) Solve Problems Modeled by Quadratic Equations

258) A rain gutter is made from sheets of aluminum that are 29 inches wide. The edges are turned up to form right angles. Determine the depth of the gutter that will allow a cross–sectional area of 60 square inches. There are two solutions to this problem. Round to the nearest tenth of an inch.

A) 3.0 in. and 14.4 in.   B) 2.2 in. and 26.8 in.   C) 1.8 in. and 21.4 in.   D) 2.5 in. and 12.0 in.

Objective: (7) Solve Problems Modeled by Quadratic Equations

Solve the polynomial equation by factoring and then using the zero product principle.

259) $3x^4 - 243x^2 = 0$

A) $\{-9\sqrt{3}, 0, 9\sqrt{3}\}$ B) $\{0\}$ C) $\{-9, 9\}$ D) $\{-9, 0, 9\}$

Objective: (1) Solve Polynomial Equations by Factoring

260) $2x^4 = 54x$

A) $\{0, 3\}$ B) $\{-3, 0, 3\}$ C) $\{0\}$ D) $\{0, 2, 3\}$

Objective: (1) Solve Polynomial Equations by Factoring

261) $4x^3 + 5x^2 = 16x + 20$

A) $\left\{-2, -\dfrac{5}{4}, 2\right\}$ B) $\left\{-\dfrac{5}{4}, 2\right\}$ C) $\left\{-\dfrac{5}{4}, 0\right\}$ D) $\{-2, 2\}$

Objective: (1) Solve Polynomial Equations by Factoring

262) $5x - 3 = 45x^3 - 27x^2$

A) $\left\{-\dfrac{1}{9}, \dfrac{1}{9}, \dfrac{3}{5}\right\}$ B) $\left\{-\dfrac{1}{3}, \dfrac{1}{3}, \dfrac{3}{5}\right\}$ C) $\left\{-\dfrac{1}{3}, \dfrac{1}{3}, \dfrac{5}{3}\right\}$ D) $\left\{0, \dfrac{3}{5}\right\}$

Objective: (1) Solve Polynomial Equations by Factoring

263) $x^3 + 8x^2 + 15x = 0$

A) $\{0, -3, -5\}$ B) $\{-3, -5\}$ C) $\{3, 5\}$ D) $\{0, 3, 5\}$

Objective: (1) Solve Polynomial Equations by Factoring

264) $x^3 + 2x^2 - x - 2 = 0$

A) $\{4\}$ B) $\{1, -2, 2\}$ C) $\{-1, 1, -2\}$ D) $\{-2, 2\}$

Objective: (1) Solve Polynomial Equations by Factoring

265) $8x^3 + 64x^2 + 120x = 0$

    A) $\{-\frac{1}{3}, -5\}$ B) $\{0, 3, 5\}$ C) $\{-3, -5\}$ D) $\{0, -3, -5\}$

    Objective: (1) Solve Polynomial Equations by Factoring

Solve the radical equation, and check all proposed solutions.

266) $\sqrt{x + 5} = 2$

    A) $\{4\}$ B) $\{9\}$ C) $\{-1\}$ D) $\{49\}$

    Objective: (2) Solve Radical Equations

267) $\sqrt{4x - 3} = 3$

    A) $\{9\}$ B) $\left\{\frac{3}{2}\right\}$ C) $\{3\}$ D) $\varnothing$

    Objective: (2) Solve Radical Equations

268) $\sqrt{6x + 40} = x$

    A) $\varnothing$ B) $\{-4, 10\}$ C) $\{-8\}$ D) $\{10\}$

    Objective: (2) Solve Radical Equations

269) $\sqrt{30x + 15} = x + 8$

    A) $\{7\}$ B) $\{-6\}$ C) $\{6\}$ D) $\{-7\}$

    Objective: (2) Solve Radical Equations

270) $x - \sqrt{3x - 2} = 4$

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

    Objective: (2) Solve Radical Equations

271) $\sqrt{2x + 7} = x + 3$

    A) $\{-4\}$ B) $\{2, 8\}$ C) $\{8\}$ D) $\left\{-4, \frac{4}{3}\right\}$

    Objective: (2) Solve Radical Equations

272) $\sqrt{2x + 3} - \sqrt{x + 1} = 1$

    A) $\{-3, -1\}$ B) $\varnothing$ C) $\{3\}$ D) $\{-1, 3\}$

    Objective: (2) Solve Radical Equations

273) $\sqrt{2x + 5} - \sqrt{x - 2} = 3$

    A) $\{2, 38\}$ B) $\{2\}$ C) $\{3, 8\}$ D) $\{-2\}$

    Objective: (2) Solve Radical Equations

274) $\sqrt{x + 6} + \sqrt{2 - x} = 4$

    A) $\{2, -2\}$ B) $\{0\}$ C) $\{-2\}$ D) $\{\sqrt{31}, -2\}$

    Objective: (2) Solve Radical Equations

275) $\sqrt{2\sqrt{x+3}} = \sqrt{4x-5}$

    A) $\varnothing$

    B) $\left\{ \dfrac{11}{2} \right\}$

    C) $\left\{ \dfrac{11+\sqrt{69}}{8} \right\}$

    D) $\left\{ \dfrac{11-\sqrt{69}}{8}, \dfrac{11+\sqrt{69}}{8} \right\}$

Objective: (2) Solve Radical Equations

276) $\sqrt{1 + 14\sqrt{x}} = 1 + \sqrt{x}$

    A) $\left\{ 0, \dfrac{4}{13} \right\}$ B) $\{0, 256\}$ C) $\{0, 196\}$ D) $\{0, 144\}$

Objective: (2) Solve Radical Equations

Find the x-intercepts of the graph of the equation.

277) $y = \sqrt{2x+3} - \sqrt{x+1} - 1$

    A) –3, –1   B) No x–intercepts   C) 3   D) 3, –1

Objective: (2) Solve Radical Equations

278) $y = \sqrt{2x+5} - \sqrt{x-2} - 3$

    A) –2   B) 3, 8   C) 2   D) 2, 38

Objective: (2) Solve Radical Equations

279) $y = \sqrt{3x-2} + \sqrt{11+x} + 1$

    A) $-\dfrac{5}{2}$ B) 0   C) No x–intercepts   D) 5

Objective: (2) Solve Radical Equations

280) $y = \sqrt{x+6} + \sqrt{2-x} - 4$

    A) –2   B) $\sqrt{31}$, –2   C) 0   D) 2, –2

Objective: (2) Solve Radical Equations

Find all values of x satisfying the given conditions.

281) $y = x - \sqrt{3x-2}$ and $y = 4$

    A) 1, 2   B) 9   C) –1   D) 2, 9

Objective: (2) Solve Radical Equations

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

Solve the problem.

282) Solve the formula $r = \sqrt{\dfrac{3V}{\pi h}}$ for V.

Objective: (2) Solve Radical Equations

283) Solve the formula $r = \sqrt{\dfrac{2A}{\theta}}$ for θ.

Objective: (2) Solve Radical Equations

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

Solve and check the equation.

284) $x^{3/2} = 27$

    A) $\{9\}$ B) $\left\{\sqrt[3]{3}\right\}$ C) $\{81\sqrt{3}\}$ D) $\{3\}$

285) $5x^{7/2} - 15 = 0$

    A) $\left\{\dfrac{6}{7}\right\}$ B) $\left\{\sqrt[7]{9}\right\}$ C) $\left\{\sqrt[7]{3}\right\}$ D) $\varnothing$

286) $(x + 8)^{3/2} = 216$

    A) $\left\{\sqrt[3]{6} - 8\right\}$ B) $\{28\}$ C) $\{-2\}$ D) $\{44\}$

287) $(2x + 3)^{1/2} = 4$

    A) $\left\{-\dfrac{3}{2}\right\}$ B) $\{8\}$ C) $\left\{\dfrac{13}{2}\right\}$ D) 6

288) $(2x + 1)^{1/3} = -4$

    A) $\left\{\dfrac{15}{2}\right\}$ B) $\{-66\}$ C) $\{-32\}$ D) $\left\{-\dfrac{65}{2}\right\}$

289) $(6x - 5)^{1/3} + 5 = -2$

    A) $\{9\}$ B) $\left\{-\dfrac{169}{3}\right\}$ C) $\left\{-\dfrac{8}{3}\right\}$ D) $\varnothing$

290) $(x^2 + 12x + 36)^{3/4} - 8 = 19$

    A) $\{-15, 3\}$ B) $\{3\}$ C) $\{27\}$ D) $\{-15, 0, 3\}$

Find all values of x satisfying the given conditions.

291) $y = (x + 8)^{3/2}$ and $y = 216$

    A) $\{44\}$ B) $\{-2\}$ C) $\left\{\sqrt[3]{6} - 8\right\}$ D) $\{28\}$

Solve the equation by making an appropriate substitution.

292) $x^4 - 20x^2 + 64 = 0$

    A) $\{2, 4\}$ B) $\{-2, 2, -4, 4\}$ C) $\{-2i, 2i, -4i, 4i\}$ D) $\{4, 16\}$

293) $x^4 - 21x^2 + 80 = 0$
    A) {16, 5}   B) {−4, 4, −$\sqrt{5}$, $\sqrt{5}$}   C) {−4, 4, −$i\sqrt{5}$, $i\sqrt{5}$}   D) {4, $\sqrt{5}$}

294) $x^4 - 3x^2 - 54 = 0$
    A) {− $\sqrt{6}$, $\sqrt{6}$, −3i, 3i}   B) {−9, 6}   C) {3, $i\sqrt{6}$}   D) {−3, 3, −$i\sqrt{6}$, $i\sqrt{6}$}

295) $x - 2\sqrt{x} - 8 = 0$
    A) {12}   B) {16}   C) {8}   D) {32}

296) $x - 10\sqrt{x} + 21 = 0$
    A) {7, 3}   B) {49, 9}
    C) {−$\sqrt{7}$, $\sqrt{7}$, −$\sqrt{3}$, $\sqrt{3}$}   D) {−7, 7, −3, 3}

297) $2x - 19\sqrt{x} - 10 = 0$
    A) {100}   B) $\left\{\dfrac{1}{4}, 100\right\}$ C) {10}   D) $\left\{\dfrac{1}{2}, 10\right\}$

298) $x^{-2} - x^{-1} - 110 = 0$
    A) {11, −10}   B) $\left\{-\dfrac{1}{11}, \dfrac{1}{10}\right\}$ C) $\left\{\dfrac{1}{11}, -\dfrac{1}{10}\right\}$ D) {−11, 10}

299) $x^{-2} - 7x^{-1} + 6 = 0$
    A) $\left\{-\dfrac{1}{6}, -1\right\}$ B) $\left\{\dfrac{1}{6}, 1\right\}$ C) {−1, −6}   D) {1, 6}

300) $7x^{-2} + 8x^{-1} + 1 = 0$
    A) {−1, −7}   B) {1, 7}   C) $\left\{\dfrac{1}{7}, 1\right\}$ D) $\left\{-\dfrac{1}{7}, -1\right\}$

301) $x^{-2} - 8x^{-1} + 10 = 0$
    A) $\left\{\dfrac{4 \pm 2\sqrt{6}}{10}\right\}$ B) $\left\{\dfrac{4 \pm \sqrt{6}}{22}\right\}$ C) $\left\{\dfrac{4 \pm \sqrt{6}}{10}\right\}$ D) $\left\{\dfrac{-4 \pm \sqrt{6}}{10}\right\}$

302) $x - 32x^{1/2} - 2{,}048 = 0$
    A) {4,096}   B) {8,192}   C) {3,072}   D) {2,048}

303) $x^{2/3} - 2x^{1/3} - 3 = 0$
    A) {–1, 27}   B) {–3, 1}   C) {–27, 1}   D) {–1, 3}
    Objective: (4) Solve Equations That Are Quadratic in Form

304) $x^{2/5} - x^{1/5} - 6 = 0$
    A) {–243, 32}   B) {–3, 2}   C) {3, –2}   D) {243, –32}
    Objective: (4) Solve Equations That Are Quadratic in Form

305) $2x^{1/2} - 17x^{1/4} - 30 = 0$
    A) $\left\{10, -\dfrac{3}{2}\right\}$ B) {10,000}   C) {–10, –3}   D) $\left\{10,000, \dfrac{81}{16}\right\}$
    Objective: (4) Solve Equations That Are Quadratic in Form

306) $x^{1/2} - 10x^{1/4} + 16 = 0$
    A) {8, 2}   B) {64, 4}   C) {–8, –2}   D) {4,096, 16}
    Objective: (4) Solve Equations That Are Quadratic in Form

307) $(x - 3)^2 + 7(x - 3) + 12 = 0$
    A) {–7, –6}   B) {0, 1}   C) {6, 7}   D) {–1, 0}
    Objective: (4) Solve Equations That Are Quadratic in Form

308) $(-2x + 8)^2 + 10(-2x + 8) + 16 = 0$
    A) {0, – 3}   B) {– 8, – 5}   C) {8, 5}   D) {–8, –2}
    Objective: (4) Solve Equations That Are Quadratic in Form

309) $(2x - 7)^2 - 2(2x - 7) - 8 = 0$
    A) $\left\{\dfrac{5}{2}, \dfrac{11}{2}\right\}$ B) $\left\{-\dfrac{9}{7}, \dfrac{3}{2}\right\}$ C) $\left\{-\dfrac{5}{2}, -\dfrac{11}{2}\right\}$ D) $\left\{\dfrac{9}{2}, -\dfrac{3}{2}\right\}$
    Objective: (4) Solve Equations That Are Quadratic in Form

310) $(x^2 - 4x)^2 - 17(x^2 - 4x) + 60 = 0$
    A) {– 1, – 2, 5, 6}   B) {– 1, – 2, 5, 12, 5, 6}   C) {5, 12}   D) {5, 6}
    Objective: (4) Solve Equations That Are Quadratic in Form

311) $\left(y - \dfrac{15}{y}\right)^2 - 12\left(y - \dfrac{15}{y}\right) - 28 = 0$
    A) {– 5, – 1, 3, 15}   B) no solution   C) {– 5, 3}   D) {–2, 14}
    Objective: (4) Solve Equations That Are Quadratic in Form

Match the graph with its function using the x–intercepts.

312)
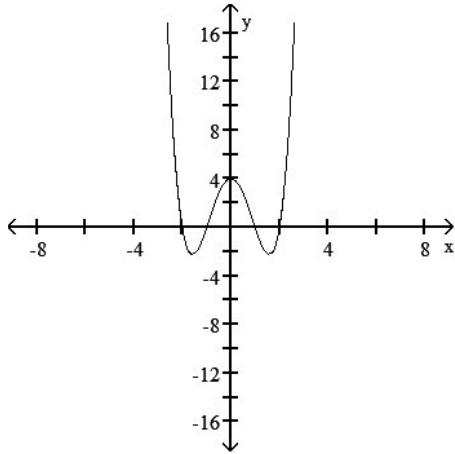
A) $y = x^4 + 5x^2 + 4$ B) $y = x^4 + 5x^2 - 4$ C) $y = x^4 - 5x^2 + 4$ D) $y = x^4 - 5x^2 - 4$

Objective: (4) Solve Equations That Are Quadratic in Form

313)
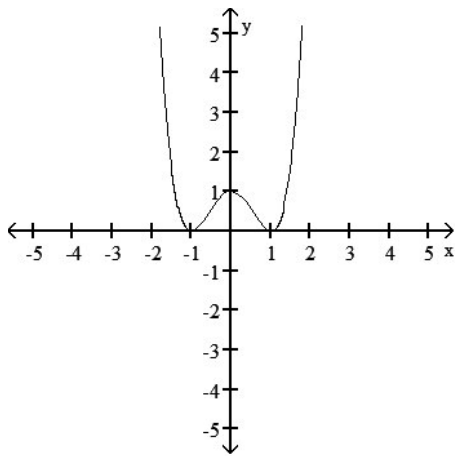
A) $y = x^4 + 2x^2 - 1$ B) $y = x^4 - 2x^2 - 1$ C) $y = x^4 + 2x^2 + 1$ D) $y = x^4 - 2x^2 + 1$

Objective: (4) Solve Equations That Are Quadratic in Form

314)
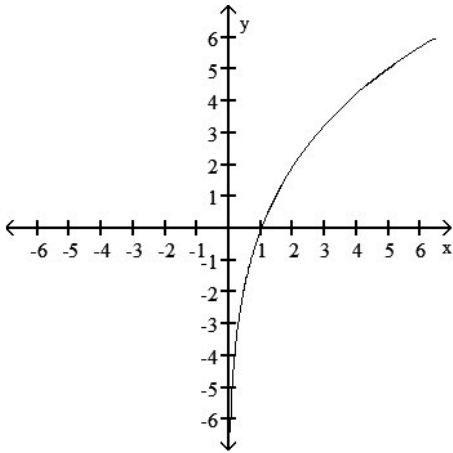
A) $y = x^{1/3} - 14x^{1/6} + 15$

B) $y = x^{1/3} + 14x^{1/6} + 15$

C) $y = x^{1/3} + 14x^{1/6} - 15$

D) $y = x^{1/3} - 14x^{1/6} - 15$

Objective: (4) Solve Equations That Are Quadratic in Form

315)
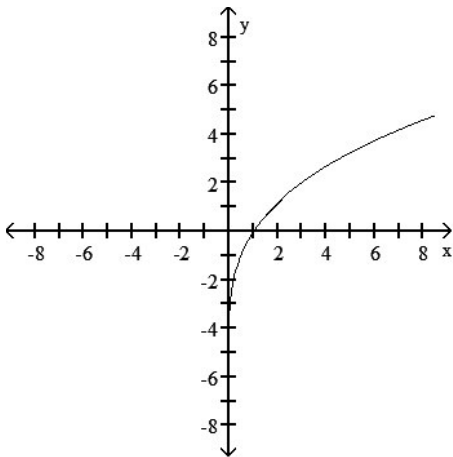
A) $y = x^{1/2} - 4x^{1/4} - 5$ B) $y = x^{1/2} + 2x^{1/4} - 1$ C) $y = x^{1/2} + 4x^{1/4} - 5$ D) $y = x^{1/2} + 2x^{1/4} + 1$

Objective: (4) Solve Equations That Are Quadratic in Form

316)
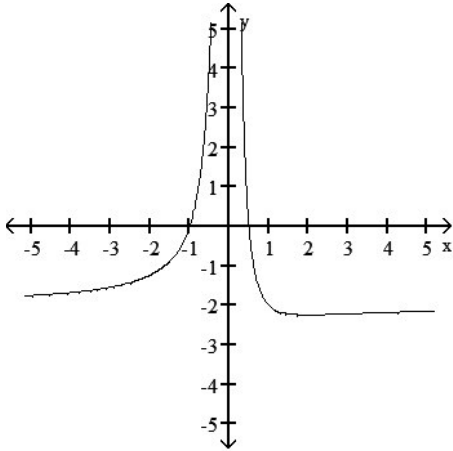
A) $y = x^{-2} + x^{-1} + 2$ B) $y = x^{-2} - x^{-1} - 2$ C) $y = x^{-2} - x^{-1} + 2$ D) $y = x^{-2} + x^{-1} - 2$

Objective: (4) Solve Equations That Are Quadratic in Form

317)
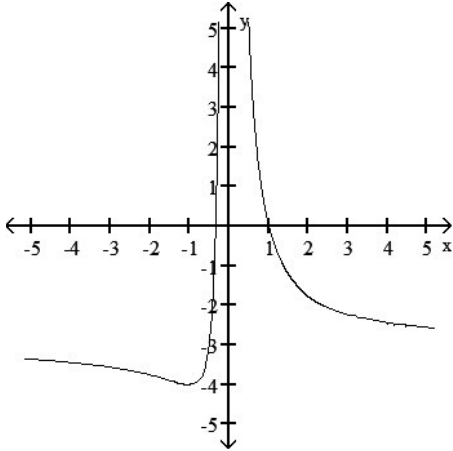
A) $y = x^{-2} + 2x^{-1} + 3$ B) $y = x^{-2} + 2x^{-1} - 3$ C) $y = x^{-2} - 2x^{-1} - 3$ D) $y = x^{-2} - 2x^{-1} + 3$

Objective: (4) Solve Equations That Are Quadratic in Form

318)
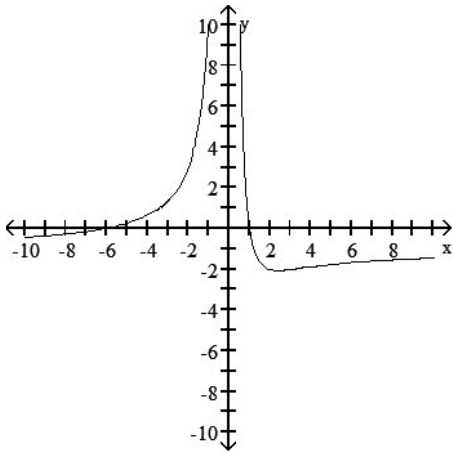
A) $y = 6x^{-2} - 5x^{-1} - 1$ B) $y = 6x^{-2} + 5x^{-1} + 1$ C) $y = 6x^{-2} + 5x^{-1} - 1$ D) $y = 6x^{-2} - 5x^{-1} + 1$

Objective: (4) Solve Equations That Are Quadratic in Form

319)
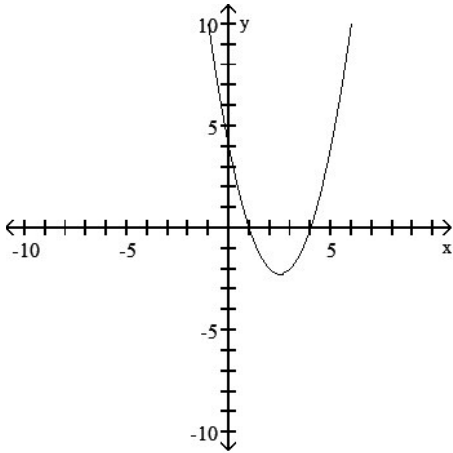
A) $y = (x - 2)^2 + 5(x - 2) + 4$ B) $y = (x - 2)^2 + 1(x - 2) - 2$

C) $y = (x - 2)^2 - 1(x - 2) - 2$ D) $y = (x - 2)^2 - 5(x - 2) + 4$

Objective: (4) Solve Equations That Are Quadratic in Form

320)
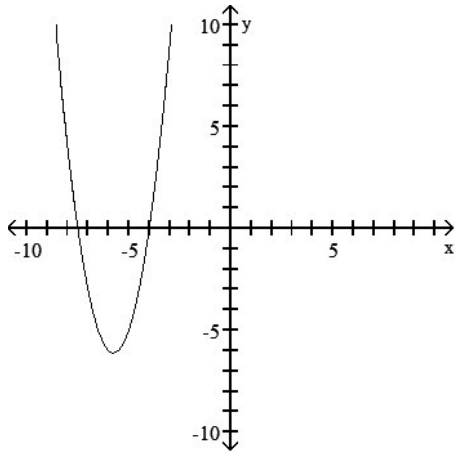
A) $y = 2(x + 5)^2 - 3(x + 5) - 5$

B) $y = 2(x - 5)^2 + 3(x - 5) - 5$

C) $y = 2(x - 5)^2 - 3(x - 5) - 5$

D) $y = 2(x + 5)^2 + 3(x + 5) - 5$

Objective: (4) Solve Equations That Are Quadratic in Form

321)
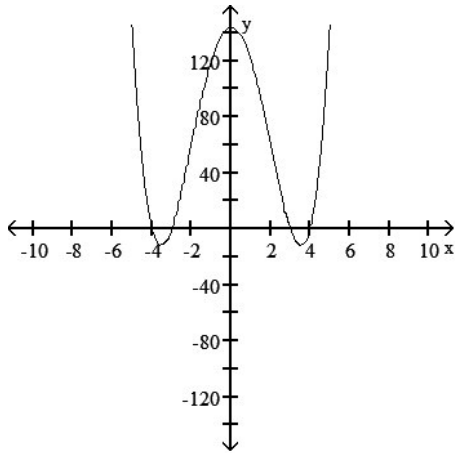
A) $y = x^4 - 25x^2 + 144$ B) $y = x^4 + 25x^2 + 144$ C) $y = x^4 + 25x^2 - 12$ D) $y = x^4 - 25x^2 + 12$

Objective: (4) Solve Equations That Are Quadratic in Form

Find all values of x satisfying the given conditions.

322) $y = (x^2 - 2x)^2 - 18(x^2 - 2x)$ and $y = -45$

A) $-1, -3, 3, 15, 3, 5$ B) 3, 5   C) $-1, -3, 3, 5$ D) 3, 15

Objective: (4) Solve Equations That Are Quadratic in Form

323) $y = \left(x - \dfrac{15}{x}\right)^2 - 12\left(x - \dfrac{15}{x}\right)$ and $y = 28$

A) $-5, 3$ B) $-5, -1, 3, 15$ C) $-2, 14$ D) No solution

Objective: (4) Solve Equations That Are Quadratic in Form

68

324) $y = x^{2/3} - 8x^{1/3}$ and $y = -15$

    A) −5, −3   B) 27, 125   C) 3, 5   D) −125, −27

    Objective: (4) Solve Equations That Are Quadratic in Form

325) $y_1 = 5(5x - 1)^{-1}$, $y_2 = 2(5x - 1)^{-2}$, and y_1 exceeds y_2 by 2

    A) $-2, -\dfrac{1}{2}$ B) $\dfrac{3}{5}, \dfrac{3}{10}$ C) $-\dfrac{1}{5}, 0$ D) $-\dfrac{1}{5}, -\dfrac{1}{10}$

    Objective: (4) Solve Equations That Are Quadratic in Form

326) $y_1 = \dfrac{x}{x - 8} + 6$, $y_2 = 5\sqrt{\dfrac{x}{x - 8}}$, and $y_1 = y_2$

    A) 12, 16   B) $-9, -\dfrac{32}{3}$ C) $9, \dfrac{32}{3}$ D) 3, 2

    Objective: (4) Solve Equations That Are Quadratic in Form

Solve the absolute value equation or indicate that the equation has no solution.

327) $|x| = 2$

    A) {4}   B) {−2, 2}   C) {−2}   D) {2}

    Objective: (5) Solve Equations Involving Absolute Value

328) $|x - 4| = 5$

    A) {1, 9}   B) {−9}   C) {−1, 9}   D) ∅

    Objective: (5) Solve Equations Involving Absolute Value

329) $|x - 6| = 5$

    A) {11}   B) {−11, −1}   C) {1, 11}   D) ∅

    Objective: (5) Solve Equations Involving Absolute Value

330) $|2x + 9| = 3$

    A) {− 3, − 6}   B) {3, 6}   C) $\left\{-\dfrac{2}{3}, -\dfrac{4}{3}\right\}$ D) ∅

    Objective: (5) Solve Equations Involving Absolute Value

331) $3|x - 3| = 18$

    A) {3, −9}   B) {3}   C) {9, −3}   D) ∅

    Objective: (5) Solve Equations Involving Absolute Value

332) $|2x + 3| + 7 = 15$

    A) $\left\{-\dfrac{11}{3}, \dfrac{5}{3}\right\}$ B) $\left\{-\dfrac{5}{2}, \dfrac{11}{2}\right\}$ C) $\left\{-\dfrac{11}{2}, \dfrac{5}{2}\right\}$ D) ∅

    Objective: (5) Solve Equations Involving Absolute Value

333) $|5x + 5| + 9 = 1$

    A) $\left\{-\dfrac{13}{5}, -\dfrac{3}{5}\right\}$ B) $\left\{\dfrac{3}{5}, \dfrac{13}{5}\right\}$ C) $\left\{-\dfrac{13}{5}\right\}$ D) ∅

    Objective: (5) Solve Equations Involving Absolute Value

334) $|2x + 7| = |x - 1|$
     A) $\{8, 2\}$ B) $\{-8, -2\}$ C) $\{-8, 5\}$ D) $\varnothing$
     Objective: (5) Solve Equations Involving Absolute Value

335) $\left|\dfrac{1}{2}x + 2\right| = \left|\dfrac{3}{4}x - 2\right|$
     A) {10, 10}   B) {16, 0}   C) {16, 12}   D) $\varnothing$
     Objective: (5) Solve Equations Involving Absolute Value

336) $\left|\dfrac{11x + 33}{3}\right| = 11$
     A) {–6, 6}   B) {6, 0}   C) {–6, 0}   D) $\varnothing$
     Objective: (5) Solve Equations Involving Absolute Value

337) $|2(x + 1) + 4| = 8$
     A) {–7, 1}   B) {–5, 0}   C) {–5, 3}   D) {–7, 0}
     Objective: (5) Solve Equations Involving Absolute Value

338) $\left|x^2 - 2x\right| = 0$
     A) {–2, 0}   B) {–2, 0, 2}   C) {0, 2}   D) $\varnothing$
     Objective: (5) Solve Equations Involving Absolute Value

339) $\left|x^2 - 4x - 4\right| = 8$
     A) {–2, 2, –6}   B) {–2, 2, 6}   C) {2, 6}   D) {–2, 2}
     Objective: (5) Solve Equations Involving Absolute Value

340) $\left|2x^2 - x - 1\right| = 3$
     A) $\left\{-\dfrac{1 - \sqrt{33}}{4}, -\dfrac{1 + \sqrt{33}}{4}\right\}$ B) $\left\{\dfrac{1 - \sqrt{33}}{4}, \dfrac{1 + \sqrt{33}}{4}\right\}$

     C) $\left\{\dfrac{1 - \sqrt{33}}{4}, -\dfrac{1 + \sqrt{33}}{4}\right\}$ D) $\varnothing$
     Objective: (5) Solve Equations Involving Absolute Value

341) $\left|x^2 - 4x + 4\right| = 2$
     A) $\{2 - \sqrt{2}\}$ B) $\{2 + \sqrt{2}\}$ C) $\{2 - \sqrt{2}, 2 + \sqrt{2}\}$ D) $\varnothing$
     Objective: (5) Solve Equations Involving Absolute Value

Find all values of x satisfying the given conditions.
     342) $y = |x + 3|$ and $y = 4$
         A) 1   B) –7, 1   C) –1, 7   D) No solutions
         Objective: (5) Solve Equations Involving Absolute Value

     343) $y = |8x + 7|$ and $y = 2$
         A) $-\dfrac{5}{7}, -\dfrac{9}{7}$ B) $-\dfrac{5}{8}, -\dfrac{9}{8}$ C) $\dfrac{5}{8}, \dfrac{9}{8}$ D) No solutions
         Objective: (5) Solve Equations Involving Absolute Value

Solve the problem.

344) For a culture of 50,000 bacteria of a certain strain, the number of bacteria N that will survive x hours is modeled by the formula $N = 5,000\sqrt{100 - x}$. After how many hours will 30,000 bacteria survive?

    A) 70 hr   B) 94 hr   C) 36 hr   D) 64 hr

345) A formula for the length of a diagonal from the upper corner of a box to the opposite lower corner is $d = \sqrt{L^2 + W^2 + H^2}$, where L, W, and H are the length, width, and height, respectively. Find the length of the diagonal of the box if the length is 23 inches, width is 15 inches, and height is 7 inches. Leave your answer in simplified radical form.

diagonal of box
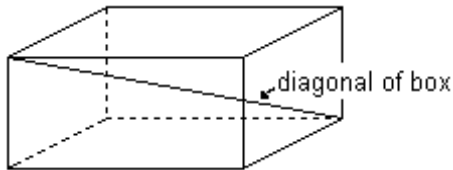
    A) $\sqrt{803}$ in.   B) $3\sqrt{5}$ in.   C) $\sqrt{1606}$ in.   D) $3\sqrt{10}$ in.

346) A balloon is secured to rope that is staked to the ground. A breeze blows the balloon so that the rope is taut while the balloon is directly above a flag pole that is 60 feet from where the rope is staked down. Find the altitude of the balloon if the rope is 120 feet long. Leave your answer in simplified radical form.
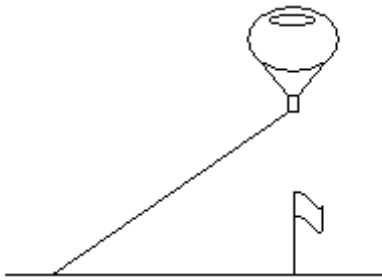
    A) $60\sqrt{5}$ ft   B) $60\sqrt{3}$ ft   C) $6\sqrt{30}$ ft   D) $2\sqrt{15}$ ft

347) A formula used to determine the velocity v in feet per second of an object (neglecting air resistance) after it has fallen a certain height is $v = \sqrt{2gh}$, where g is the acceleration due to gravity and h is the height the object has fallen. If the acceleration g due to gravity on Earth is approximately 32 feet per second per second, find the velocity of a bowling ball after it has fallen 60 feet. (Round to the nearest tenth.)

    A) 43.8 ft per sec   B) 3,840 ft per sec   C) 62.0 ft per sec   D) 11.0 ft per sec

348) For a cone, the formula $r = \sqrt{\dfrac{3V}{\pi h}}$ describes the relationship between the radius r of the base, the volume V, and the height h. Find the volume if the radius is 5 inches and the cone is 9 inches high. (Use 3.14 as an approximation for π, and round to the nearest tenth.)

    A) 235.5 cubic in.   B) 2,119.5 cubic in.   C) 47.1 cubic in.   D) 26.2 cubic in.

349) The formula $v = \sqrt{2.5r}$ can be used to estimate the maximum safe velocity v, in miles per hour, at which a car can travel along a curved road with a radius of curvature r, in feet. To the nearest whole number, find the radius of curvature if the maximum safe velocity is 25 miles per hour.

A) 250 ft   B) 625 ft   C) 1,563 ft   D) 100 ft

Objective: (6) Solve Problems Modeled by Equations

350) The function $f(x) = 6.75\sqrt{x} + 12$ models the amount, f(x), in billions of dollars of new student loans x years after 1993. According to the model, in what year is the amount loaned expected to reach $25.5 billion?

A) 2,002   B) 2,000   C) 1,997   D) 2,001

Objective: (6) Solve Problems Modeled by Equations

351) When an object is dropped to the ground from a height of h meters, the time it takes for the object to reach the ground is given by the equation $t = \sqrt{\dfrac{h}{4.9}}$, where t is measured in seconds. Solve the equation for h. Use the result to determine the height from which an object was dropped if it hits the ground after falling for 2 seconds.

A) $h = 24.01t^2$; 96 m   B) $h = 24.01t$; 48 m   C) $h = 4.9t^2$; 19.6 m   D) $h = 4.9t$; 9.8 m

Objective: (6) Solve Problems Modeled by Equations

352) The maximum number of volts, E, that can be placed across a resistor is given by the formula $E = \sqrt{PR}$, where P is the number of watts of power that the resistor can absorb and R is the resistance of the resistor in ohms. Solve this equation for R. Use the result to determine the resistance of a resistor if P is $\dfrac{1}{2}$ watts and E is 20 volts.

A) $R = \dfrac{E^2}{P^2}$; 1,600 ohms

B) $R = E^2P^2$; 1,600 ohms

C) $R = \dfrac{E^2}{P}$; 800 ohms

D) $R = E^2P$; 800 ohms

Objective: (6) Solve Problems Modeled by Equations

353) The number of centimeters, d, that a spring is compressed from its natural, uncompressed position is given by the formula $d = \sqrt{\dfrac{2W}{k}}$, where W is the number of joules of work done to move the spring and k is the spring constant. Solve this equation for W. Use the result to determine the work needed to move a spring 4 centimeters if it has a spring constant of 0.4.

A) $W = \dfrac{d^2 k}{2}$; 3.2 joules

B) $W = \dfrac{d^2 k^2}{4}$; 0.6 joules

C) $W = 2d^2k$; 12.8 joules

D) $W = \dfrac{2d^2}{k}$; 80 joules

Objective: (6) Solve Problems Modeled by Equations

354) The algebraic expression $0.07d^{3/2}$ describes the duration of a storm, in hours, whose diameter is d miles. Use a calculator to determine the duration of a storm with a diameter of 7 miles. Round to the nearest hundredth.

A) 1.3 hr   B) 18.52 hr   C) 0.34 hr   D) 0.19 hr

Objective: (6) Solve Problems Modeled by Equations

355) Two cars leave an intersection. One car travels north; the other east. When the car traveling north had gone 15 mi, the distance between the cars was 5 mi more than the distance traveled by the car heading east. How far had the east bound car traveled?

A) 30 mi   B) 15 mi   C) 25 mi   D) 20 mi

356) A ladder is resting against a wall. The top of the ladder touches the wall at a height of 18 ft. Find the length of the ladder if the length is 6 ft more than its distance from the wall.

A) 30 ft   B) 24 ft   C) 36 ft   D) 18 ft

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

357) (–6, 7]
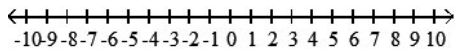
A) $\{x \mid -6 \le x \le 7\}$

B) $\{x \mid -6 < x < 7\}$
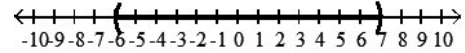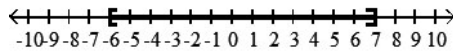
C) $\{x \mid x \le 7\}$

D) $\{x \mid -6 < x \le 7\}$
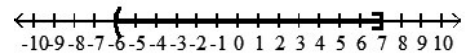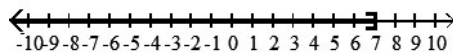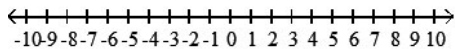
358) [–4, 7)

A) $\{x \mid -4 \le x \le 7\}$
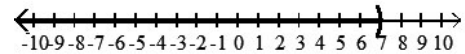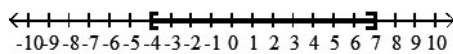
B) $\{x \mid x < 7\}$

C) $\{x \mid -4 < x \le 7\}$

D) $\{x \mid -4 \le x < 7\}$
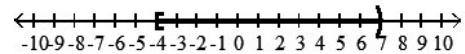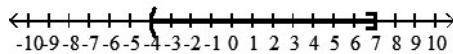
359) $\left(-\infty, \dfrac{3}{2}\right]$
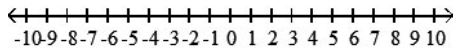
A) $\left\{x \mid x > \dfrac{3}{2}\right\}$
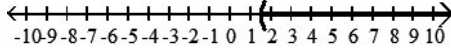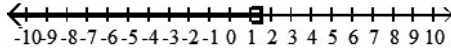
B) $\left\{x \mid x < \dfrac{3}{2}\right\}$

C) $\left\{x \mid x \le \dfrac{3}{2}\right\}$
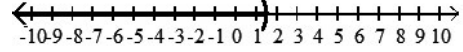
D) $\{x \mid 2 \le x \le 3\}$
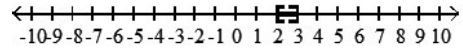
Objective: (1) Use Interval Notation

360) [−5, 9]
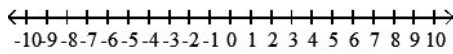
A) $\{x \mid -5 \le x \le 9\}$
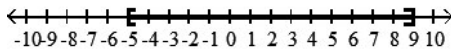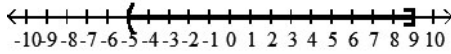
B) $\{x \mid -5 \le x < 9\}$

C) $\{x \mid -5 < x \le 9\}$
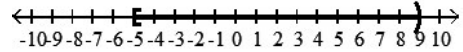
D) $\{x \mid -5 < x < 9\}$
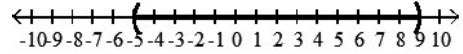
Objective: (1) Use Interval Notation

361) (−7, ∞)
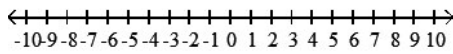
A) $\{x \mid x \ge -7\}$
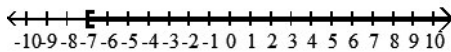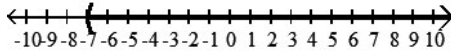
B) $\{x \mid x \ge -7\}$

C) $\{x \mid x > -7\}$
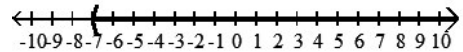
D) $\{x \mid x > -7\}$
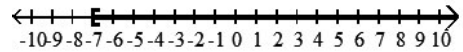
Objective: (1) Use Interval Notation

362) [4, ∞)
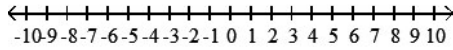
A) {x | x > 4}
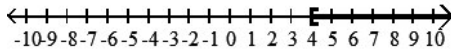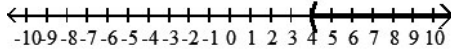
B) {x | x ≥ 4}

C) {x | x > 4}
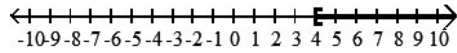
D) {x | x ≥ 4}
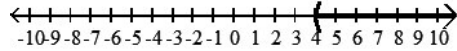
Objective: (1) Use Interval Notation

363) (−∞, 8.5]
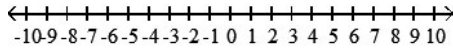
A) {x | x > 8.5}
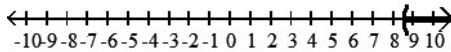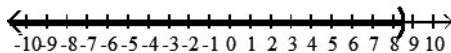
B) {x | x ≤ 8.5}

C) {x | x < 8.5}
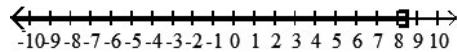
D) {x | x ≥ 8.5}
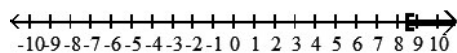
Objective: (1) Use Interval Notation

Use graphs to find the set.

364) (−5, 0) ∩ [−4, 7]
    A) [−4, 0)   B) (−5, 7]   C) (−5, −4]   D) (0, 7]
    Objective: (2) Find Intersections and Unions of Intervals

365) (−8, 0) ∪ [−1, 2]
    A) [−1, 0)   B) (0, 2]   C) (−8, 2]   D) (−8, −1]
    Objective: (2) Find Intersections and Unions of Intervals

366) (−∞, 3) ∩ [−6, 12)
    A) (−∞, 12)   B) (−∞, −6]   C) (3, 12)   D) [−6, 3)
    Objective: (2) Find Intersections and Unions of Intervals

367) (−∞, 3) ∪ [−4, 11)
    A) (−∞, 11)   B) [−4, 3)   C) (−∞, −4]   D) (3, 11)
    Objective: (2) Find Intersections and Unions of Intervals

368) (9, ∞) ∩ [10, ∞)
    A) (9, 10]   B) [10, ∞)   C) (−∞, ∞)   D) (9, ∞)
    Objective: (2) Find Intersections and Unions of Intervals

369) (5, ∞) ∪ [12, ∞)
    A) (−∞, ∞)   B) (5, ∞)   C) (5, 12]   D) [12, ∞)
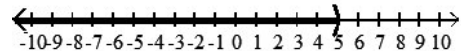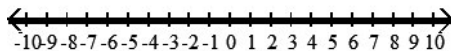   Objective: (2) Find Intersections and Unions of Intervals

Solve the linear inequality. Other than $\varnothing$, use interval notation to express the solution set and graph the solution set on a number line.

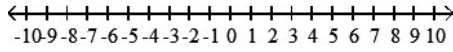370) $3x + 1 < 13$

A) $(-\infty, 4)$

B) $[4, \infty)$
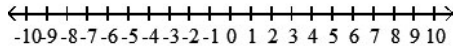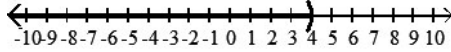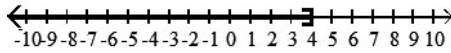
C) $(-\infty, 4]$
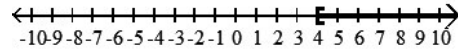
D) $(4, \infty)$
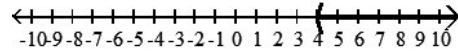
Objective: (3) Solve Linear Inequalities

371) $-4x \geq 20$

A) $[5, \infty)$

B) $(-\infty, -5]$
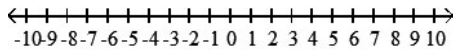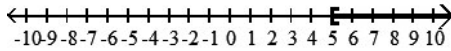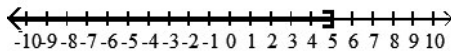
C) $(-\infty, 5]$
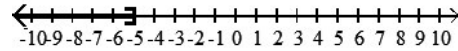
D) $[-5, \infty)$
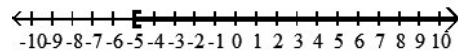
Objective: (3) Solve Linear Inequalities

372) $6x - 2 > 5x - 5$
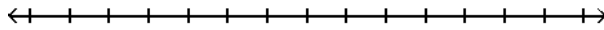
A) $(-7, \infty)$

B) $(-3, \infty)$

C) $[-3, \infty)$

D) $(-\infty, -3]$
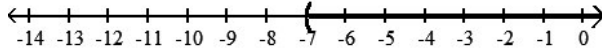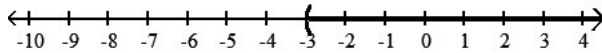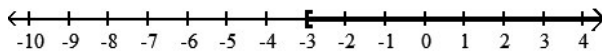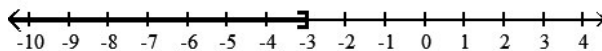
Objective: (3) Solve Linear Inequalities

373) $7x + 7 \geq 6x + 9$
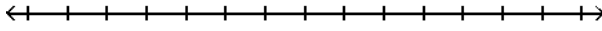
A) $(16, \infty)$
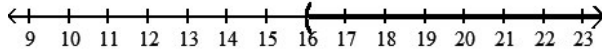
B) $(-\infty, 2]$
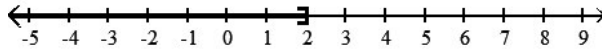
C) $[2, \infty)$

D) $(-\infty, 2)$
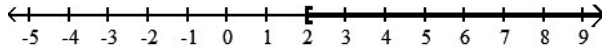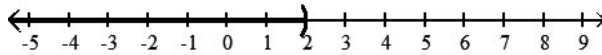
Objective: (3) Solve Linear Inequalities

374) $15x - 15 > 5(2x - 4)$
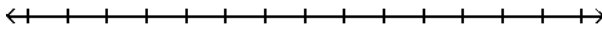
A) $(-\infty, -1)$
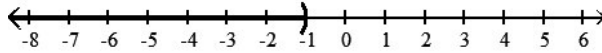
B) $[-1, \infty)$
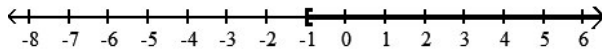
C) $(-1, \infty)$

D) $(-7, \infty)$
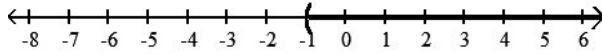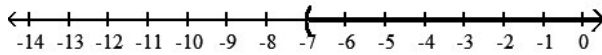
Objective: (3) Solve Linear Inequalities

375) −6(2x − 1) < −18x − 36
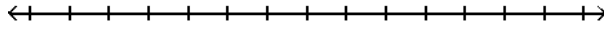
   A) (−∞, −7]
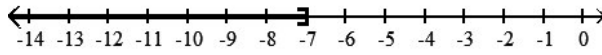
   B) (−7, ∞)
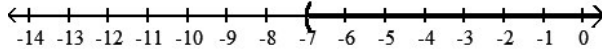
   C) (−∞, 5]

   D) (−∞, −7)
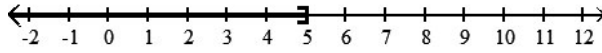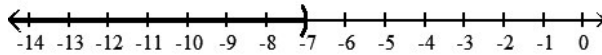
Objective: (3) Solve Linear Inequalities

376) −8x + 4 ≤ −2(3x − 8)
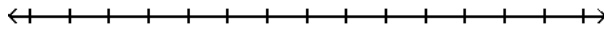
   A) (−∞, −6)
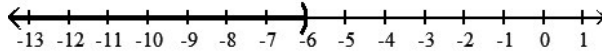
   B) (−∞, −6]
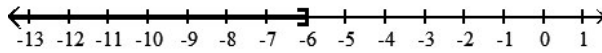
   C) [−6, ∞)
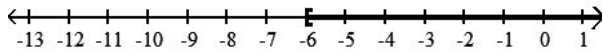
   D) (−6, ∞)
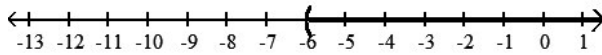
Objective: (3) Solve Linear Inequalities

377) $30x - 24 \le 6(4x - 2)$
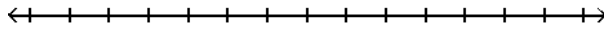
    A) $(-\infty, 2)$
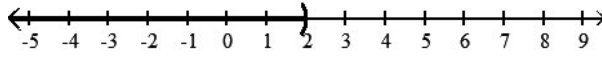
    B) $(-\infty, 2]$
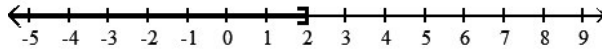
    C) $[-\infty, -6)$

    D) $[2, \infty)$
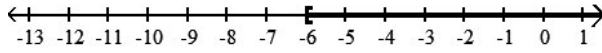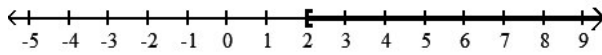
Objective: (3) Solve Linear Inequalities

378) $\dfrac{x}{6} - \dfrac{2}{3} \le \dfrac{x}{4} + 2$
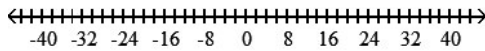
    A) $\left(-\infty, -32\right)$ B) $\left(-\infty, -32\right]$
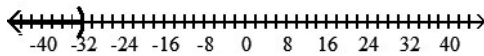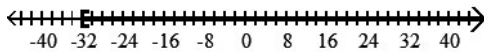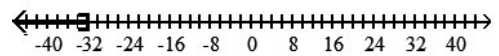
    C) $\left[-32, \infty\right)$ D) $\left(-32, \infty\right)$
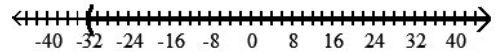
Objective: (3) Solve Linear Inequalities

379) $\dfrac{x - 2}{12} \ge \dfrac{x - 5}{18} + \dfrac{1}{36}$

    A) $(-3, \infty)$ B) $(-\infty, -3]$

    C) $(-\infty, -3)$ D) $[-3, \infty)$

Objective: (3) Solve Linear Inequalities

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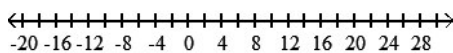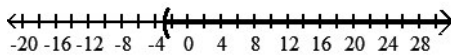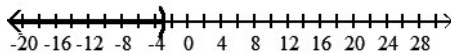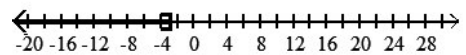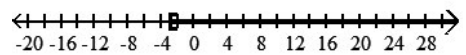
Use interval notation to represent all values of x satisfying the given conditions.

380) $y_1 = 7x + 6$, $y_2 = 6x + 7$, and $y_1 > y_2$.

A) $(13, \infty)$ B) $(1, \infty)$ C) $(-\infty, 1]$ D) $[1, \infty)$

381) $y_1 = 4x - 6$, $y_2 = 3x - 4$, and $y_1 \le y_2$.

A) $[2, \infty)$ B) $(-\infty, 2]$ C) $(-\infty, 2)$ D) $[-10, \infty)$

382) $y_1 = \dfrac{x}{3}$, $y_2 = 2 + \dfrac{x}{9}$, and $y_1 \ge y_2$.

A) $[9, \infty)$ B) $(-\infty, 9]$ C) $(9, \infty)$ D) $[-9, \infty)$

383) $y = 11 - 3(3 - x)$ and y is at most 8.

A) $(-\infty, 3]$ B) $(-\infty, 2)$ C) $(-\infty, 2]$ D) $[2, \infty)$

384) $y = \dfrac{x - 4}{25} - \dfrac{x - 4}{30} - \dfrac{1}{150}$ and y is at least 0.

A) $(-\infty, 5)$ B) $(-\infty, 5]$ C) $[5, \infty)$ D) $(5, \infty)$

Solve the problem.

385) When making a long distance call from a certain pay phone, the first three minutes of a call cost $1.15. After that, each additional minute or portion of a minute of that call costs $0.25. Use an inequality to find the number of minutes one can call long distance for $3.15.

A) 13 minutes or fewer   B) 11 minutes or fewer
C) 8 minutes or fewer   D) 3 minutes or fewer

386) It takes 24 minutes to set up a candy making machine. Once the machine is set up, it produces 20 candies per minute. Use an inequality to find the number of candies that can be produced in 8 hours if the machine has not yet been set up.

A) 3,840 candies or fewer   B) 160 candies or fewer
C) 9,120 candies or fewer   D) 11,040 candies or fewer

387) A certain store has a fax machine available for use by its customers. The store charges $2.05 to send the first page and $0.40 for each subsequent page. Use an inequality to find the number of pages that can be faxed for $4.85.

A) 48 pages or fewer   B) 12 pages or fewer   C) 8 pages or fewer   D) 2 pages or fewer

388) Claire has received scores of 85, 88, 87, and 85 on her algebra tests. What score must she receive on the fifth test to have an overall test score average of at least 88?

A) 95 or greater   B) 93 or greater   C) 96 or greater   D) 94 or greater

389) Using data from 1996–1998, the annual number of cars sold at a certain dealership can be modeled by the formula
    y = 3x + 3,
    where y is the number of cars, in thousands, sold x years after 1996. According to this formula, in which years will the number of cars sold exceed 33 thousand?
    A) Years after 2,004   B) Years after 2,008   C) Years after 2,006   D) Years after 2,010

390) ABC phone company charges $20 per month plus 7¢ per minute of phone calls. XYZ phone company charges $14 per month plus 10¢ per minute of phone calls. How many minutes of phone calls in a month make XYZ phone company the better deal?
    A) Less than 20 minutes   B) Less than 200 minutes
    C) More than 200 minutes   D) More than 20 minutes

391) Greg is opening a car wash. He estimates his cost equation as C = 5,000 + 0.05x and his revenue equation as R = 1.6x, where x is the number of cars washed in a six–month period. Find the number of cars that must be washed in a six–month period for Greg to make a profit.
    A) At least 3,226 cars   B) At least 323 cars   C) At least 2,226 cars   D) At least 32,259 cars

392) A standard train ticket in a certain city costs $2.50 per ride. People who use the train also have the option of purchasing a frequent–rider pass for $17.25 each month. With the pass, a ticket costs only $1.75 per ride. How many train rides in a month make the frequent–rider pass a better deal than standard train tickets?
    A) 24 or more rides   B) 22 or more rides   C) 25 or more rides   D) 23 or more rides

393) Every Sunday, Jarod buys a loaf of fresh bread for his family from the corner bakery for $2.00. The local department store has a sale on breadmakers for $73. If the bread–making supplies cost $0.93 per week, for how many weeks would Jarod have to bake a loaf of bread at home before the breadmaker starts saving him money?
    A) At least 68 weeks   B) At least 69 weeks   C) At least 71 weeks   D) At least 70 weeks

Solve the linear inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

394) 5(4x + 5) – 4x < 4(6 + 4x) – 6
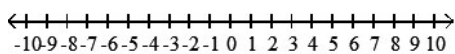
A) (∞ , ∞)   B) (∞ , 5)

C) (5, ∞)   D) ∅
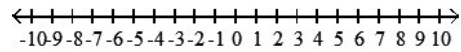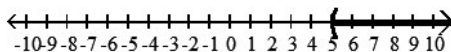
395) $5(x + 2) \geq 4(x - 1) + x$

  A) $(\infty, 4]$ B) (∞, ∞)

  C) $[4, \infty)$ D) $\emptyset$

Objective: (4) Recognize Inequalities with No Solution or All Real Numbers as Solutions

396) $-6x \leq -6(x - 2)$
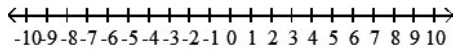
  A) $[-2, \infty)$ B) $(\infty, -2]$
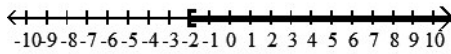
  C) $\emptyset$ D) (∞, ∞)
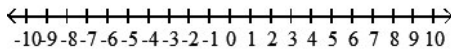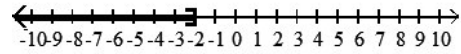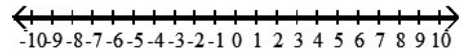
Objective: (4) Recognize Inequalities with No Solution or All Real Numbers as Solutions

Solve the compound inequality. Other than $\emptyset$, use interval notation to express the solution set and graph the solution set on a number line.

397) $12 < 4x \leq 28$
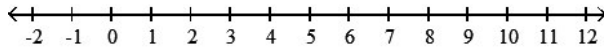
  A) $[3, 7)$
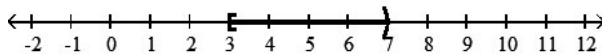
  B) $(-\infty, 3) \cup [7, \infty)$
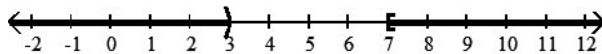
  C) $(3, 7]$
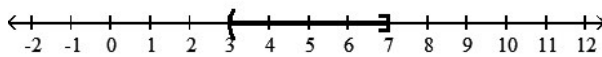
  D) $(-\infty, 3] \cup (7, \infty)$

Objective: (5) Solve Compound Inequalities

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398) $-4 < x - 2 \leq 2$

A) [–6, 0)

B) (–6, 0]

C) [–2, 4)
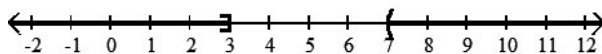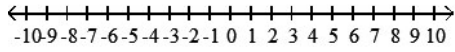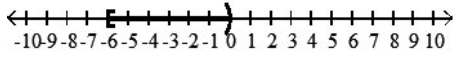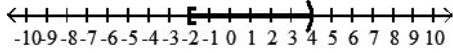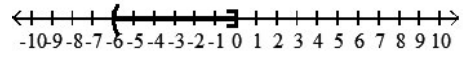
D) (–2, 4]
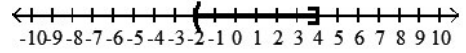
Objective: (5) Solve Compound Inequalities

399) $7 \leq 3x - 5 \leq 10$
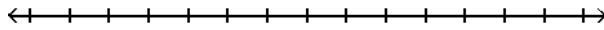
A) [–5, –4]
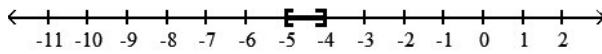
B) (4, 5)
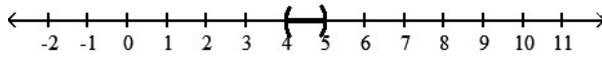
C) (–5, –4)
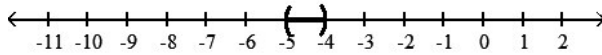
D) [4, 5]
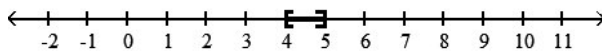
Objective: (5) Solve Compound Inequalities

400) $-10 \leq -2x + 4 < -4$
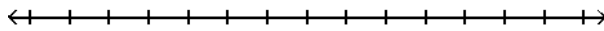
A) [–7, –4)
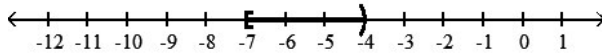
B) (4, 7]
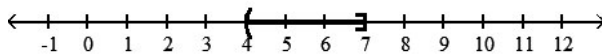
C) [4, 7)
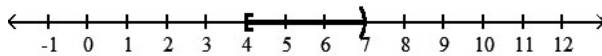
D) (–7, –4]

Objective: (5) Solve Compound Inequalities

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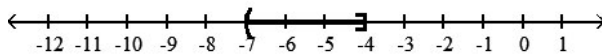
401) $-5 \le -2x + 5 \le 1$
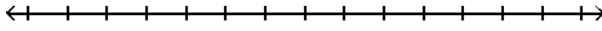
   A) [2, 5]
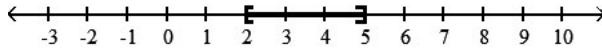
   B) [−5, −2]
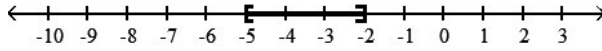
   C) (2, 5)
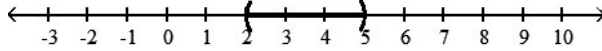
   D) (−5, −2)
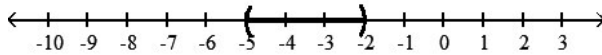
Objective: (5) Solve Compound Inequalities

402) $-4 \le -4x - 12 < 4$
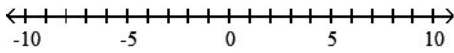
   A) [−4, −2]
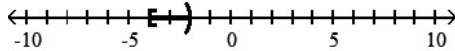
   C) (−4, −2]
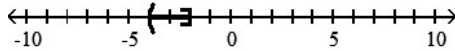
   B) (−∞, −4) or [−2, ∞)
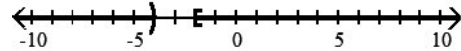
   D) (−∞, −4]
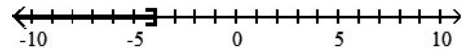
Objective: (5) Solve Compound Inequalities

403) $10 \le \dfrac{7}{3}x + 3 < 17$
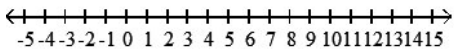
   A) (3, 4]
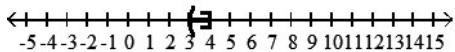
   C) [3, 6)
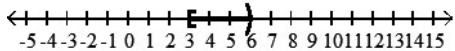
   B) [3, 4)
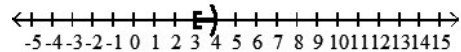
   D) (3, 6)
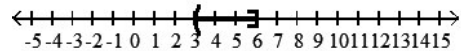
Objective: (5) Solve Compound Inequalities

Solve the problem.

404) The formula for converting Fahrenheit temperature, F, to Celsius temperature, C, is

$$C = \frac{5}{9}(F - 32).$$

If Celsius temperature ranges from −85° to −40°, inclusive, what is the range for the Fahrenheit temperature?
    A) (−121°F, −40°F)   B) [−27°F, −22°F]   C) [−121°F, −40°F]   D) (−27°F, −22°F)
Objective: (5) Solve Compound Inequalities

405) The formula for converting Celsius temperature, C, to Fahrenheit temperature, F, is

$$F = \frac{9}{5}C + 32.$$

If Fahrenheit temperature ranges from 185° to 302°, inclusive, what is the range for the Celsius temperature?
    A) (365°C, 576°C)   B) [365°C, 576°C]
    C) (85°C, 150°C)   D) [85°C, 150°C]
Objective: (5) Solve Compound Inequalities

406) On the first four exams, your grades are 76, 81, 70, and 77. You are hoping to earn a C in the course. This will occur if the average of your five exam grades is greater than or equal to 70 and less than 80. What range of grades on the fifth exam will result in earning a C?
    A) (36, 86]   B) [46, 96)   C) (46, 96]   D) [36, 86)
Objective: (5) Solve Compound Inequalities

407) On the first four exams, your grades are 79, 95, 62, and 80. There is still a final exam, and it counts as two grades. You are hoping to earn a C in the course. This will occur if the average of your six exam grades is greater than or equal to 70 and less than 80. What range of grades on the final exam will result in earning a C?
    A) [34, 84)   B) [52, 82]   C) [34, 84]   D) [52, 82)
Objective: (5) Solve Compound Inequalities

408) Parts for an automobile repair cost $300. The mechanic charges $25 per hour. If you receive an estimate for at least $350 and at most $425 for fixing the car, what is the time interval, in hours, that the mechanic will be working on the job?
    A) [14, 17]   B) [2, 5]   C) [1, 2]   D) [1, 5]
Objective: (5) Solve Compound Inequalities

409) The formula C = 2x + 16 represents the estimated future cost of yearly attendance at State University, where C is the cost in thousands of dollars x years after 2002. Use a compound inequality to determine when the attendance costs will range from 34 to 42 thousand dollars.
    A) From 2,010 to 2,014   B) From 2,012 to 2,016   C) From 2,012 to 2,014   D) From 2,011 to 2,015
Objective: (5) Solve Compound Inequalities

Solve the absolute value inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

410) $|x| < 6$
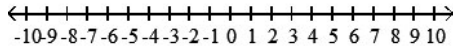
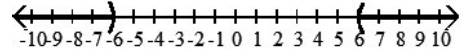   A) $(-\infty, -6] \cup [6, \infty)$ B) $(-6, 6)$
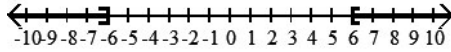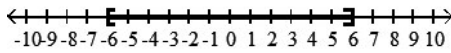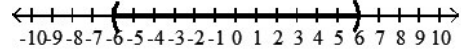
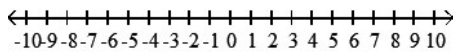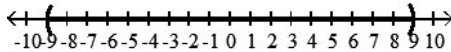   C) $[-6, 6]$ D) $(-\infty, -6) \cup (6, \infty)$
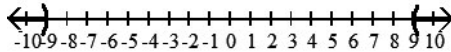
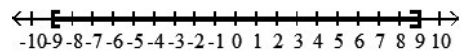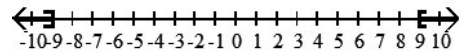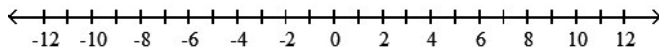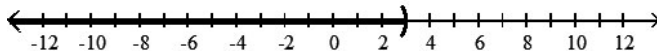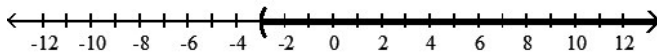Objective: (6) Solve Absolute Value Inequalities
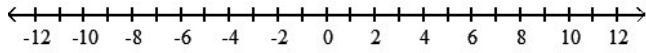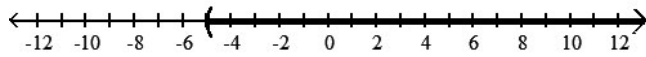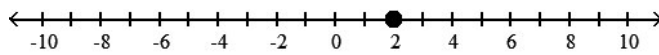
411) $|x| > 9$

    A) $(-9, 9)$ B) $[-9, 9]$

    C) $(-\infty, -9) \cup (9, \infty)$ D) $(-\infty, -9] \cup [9, \infty)$

Objective: (6) Solve Absolute Value Inequalities

412) $|x - 3| < 0$

    A) $(-\infty, 3)$

    B) $(-3, \infty)$

    C) $(-3, 3)$

    D) ∅
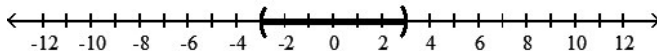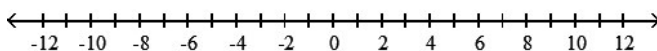
Objective: (6) Solve Absolute Value Inequalities

413) $|x + 5| > 0$

A) $(-5, \infty)$

B) $(-\infty, -5) \cup (-5, \infty)$
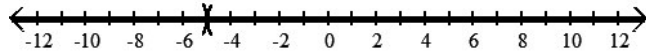
C) $(-5, 5)$

D) $\varnothing$
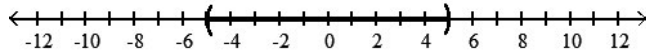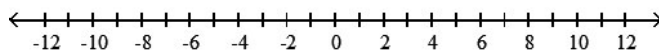
Objective: (6) Solve Absolute Value Inequalities
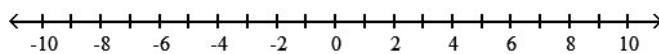
414) $|x + 2| \le 0$
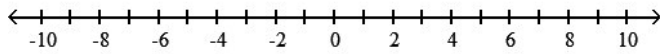
A) $\{2\}$

B) $\{-2\}$
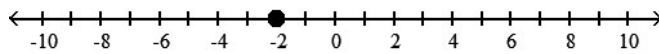
C) $(-\infty, -2)$

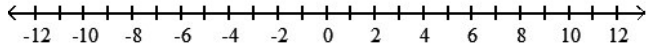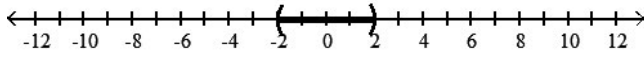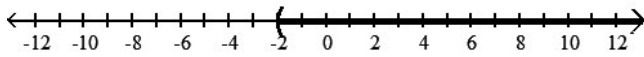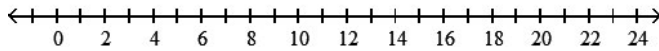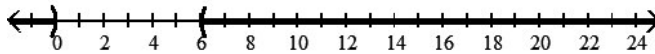D) $\varnothing$

Objective: (6) Solve Absolute Value Inequalities

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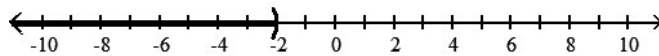
415) $|x + 2| \geq 0$

A) (–2, 2)

B) {–2}
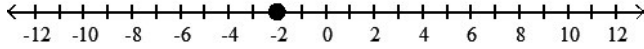
C) (–∞, ∞)
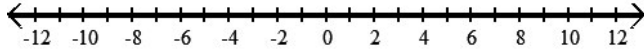
D) (–2, ∞)

Objective: (6) Solve Absolute Value Inequalities
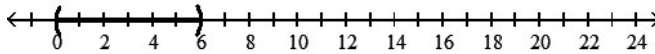
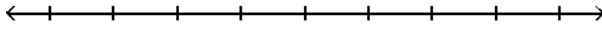416) $|x - 3| < 3$

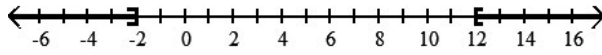A) (–∞, 0) ∪ (6, ∞)

B) [0, 6]
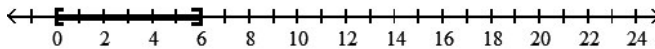
C) ∅
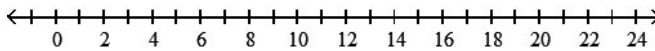
D) (0, 6)

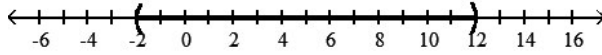Objective: (6) Solve Absolute Value Inequalities
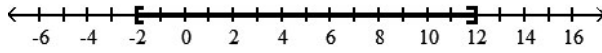
417) $|x - 5| - 1 \leq 6$

A) $(-\infty, -2] \cup [12, \infty)$

B) $(-2, 12)$

C) $[-2, 12]$

D) $[-2, 6]$

Objective: (6) Solve Absolute Value Inequalities

418) $\left| 3(x + 1) + 9 \right| \leq 15$

A) $(-9, 1)$
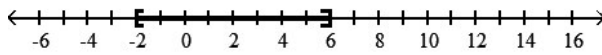

B) $[-9, 1]$

C) $(-7, 3)$
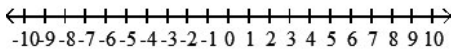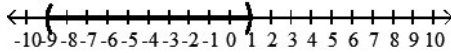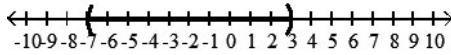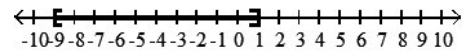
D) $[-7, 3]$

Objective: (6) Solve Absolute Value Inequalities

419) $\left| \dfrac{3y + 12}{4} \right| < 3$

A) $(-\infty, -8) \cup (0, \infty)$

B) $(-8, 0)$

C) $(-\infty, -8) \cup (8, \infty)$
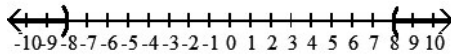
D) $(-8, 8)$
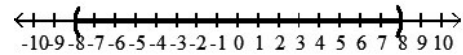
Objective: (6) Solve Absolute Value Inequalities

420) $5 + \left| 1 - \dfrac{x}{2} \right| \geq 8$

~~~
←+++++++++++++++++++++→
 -10-9-8-7-6-5-4-3-2-1 0 1 2 3 4 5 6 7 8 9 10
~~~

   A) $(-\infty, -8] \cup [4, \infty)$

~~~
←++ E++++++++++++ E+++→
 -10-9-8-7-6-5-4-3-2-1 0 1 2 3 4 5 6 7 8 9 10
~~~

   C) $[-8, 4]$

~~~
←+++ E++++++++++ E++++→
 -10-9-8-7-6-5-4-3-2-1 0 1 2 3 4 5 6 7 8 9 10
~~~

B) $(-\infty, -4] \cup [8, \infty)$

~~~
←+++++ E++++++++++++ E+→
 -10-9-8-7-6-5-4-3-2-1 0 1 2 3 4 5 6 7 8 9 10
~~~

D) $[-4, 8]$
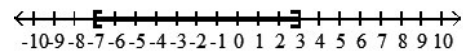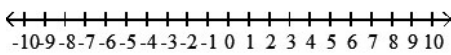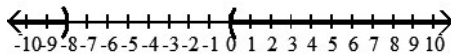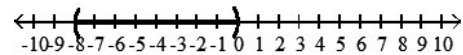
~~~
←++++++ E++++++++++ E++→
 -10-9-8-7-6-5-4-3-2-1 0 1 2 3 4 5 6 7 8 9 10
~~~
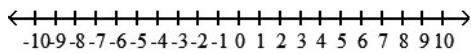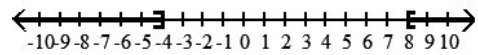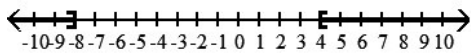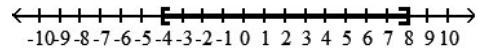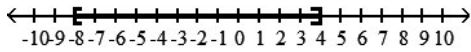
Objective: (6) Solve Absolute Value Inequalities

421) $|5x + 6| - 4 < -7$

~~~
←———+———+———+———+———+———+———+———+———+———→
   -1   0   1   2   3   4   5   6   7
~~~

A) $\left(-\infty, -\dfrac{9}{5} \right)$

~~~
←)———+———+———+———+———+———+———+———+———→
   -1   0   1   2   3   4   5   6   7
~~~

B) $\left(-\dfrac{9}{5}, -\dfrac{3}{5} \right)$

~~~
←( ———)———+———+———+———+———+———+———+———→
   -1   0   1   2   3   4   5   6   7
~~~

C) $\left(-\infty, -\dfrac{3}{5} \right)$

~~~
←————————)———+———+———+———+———+———+———+———→
   -1   0   1   2   3   4   5   6   7
~~~

D) $\varnothing$

~~~
←———+———+———+———+———+———+———+———+———+———→
   -1   0   1   2   3   4   5   6   7
~~~
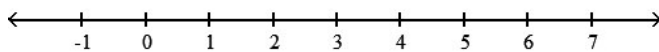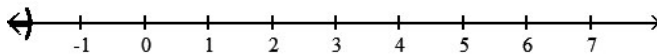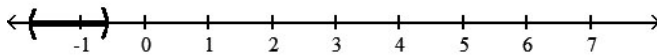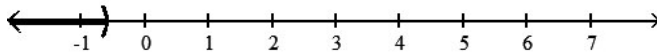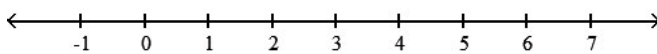
Objective: (6) Solve Absolute Value Inequalities

422) $|4x - 9| - 4 > -10$

A) $\left(\dfrac{3}{4}, \dfrac{15}{4}\right)$

B) $\left(\dfrac{3}{4}, \infty\right)$

C) $(-\infty, \infty)$

D) $\varnothing$
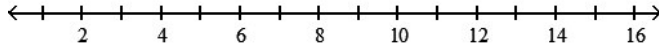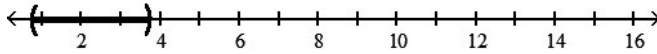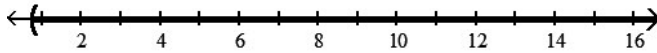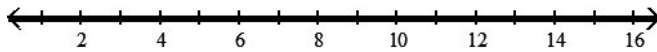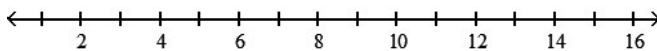
Solve the problem.

423) A spinner has five regions numbered 1 through 5. If the spinner is spun 100 times, we would expect about 20 of the outcomes to be Region 1. It can be determined that the spinner is unbalanced if x, the number of outcomes that result in Region 1, satisfies $\left|\dfrac{x - 20}{4}\right| \geq 1.645$. Describe the number of outcomes that determine an unbalanced spinner that is spun 100 times.
   A) Between 17 and 29 outcomes
   B) Between 14 and 26 outcomes
   C) Fewer than 17 or more than 29 outcomes
   D) Fewer than 14 or more than 26 outcomes

424) When a number is subtracted from –7, the absolute value of the difference is more than 3. Use interval notation to express the set of all numbers that satisfy this condition.
   A) $(\infty, -4) \cup (10, \infty)$
   B) $(-10, -4)$
   C) $(\infty, -10] \cup [-4, \infty)$
   D) $(\infty, -10) \cup (-4, \infty)$

425) A landscaping company sells 40–pound bags of top soil. The actual weight x of a bag, however, may differ from the advertised weight by as much as 0.75 pound. Write an inequality involving absolute value that expresses the relationship between the actual weight x of a bag and 40 pounds. Solve the inequality, and express the answer in interval form.
   A) $|x| - 40 \leq 0.75$; $(\infty, 40.75]$
   B) $|x + 0.75| \leq 40$; $[39.25, \infty)$
   C) $|40 - x| \leq 0.75$; $[39.25, 40.75]$
   D) $|40 + x| \leq 0.75$; $[39.25, 40.75]$

1) A	51) D	101) B	151) A
2) C	52) D	102) B	152) A
3) D	53) A	103) D	153) B
4) A	54) B	104) B	154) B
5) D	55) C	105) D	155) D
6) D	56) D	106) C	156) D
7) D	57) D	107) A	157) C
8) D	58) D	108) C	158) A
9) A	59) B	109) A	159) C
10) D	60) D	110) D	160) A
11) A	61) C	111) D	161) D
12) A	62) A	112) D	162) B
13) D	63) A	113) C	163) C
14) A	64) B	114) A	164) B
15) B	65) A	115) B	165) B
16) B	66) A	116) D	166) D
17) B	67) A	117) A	167) B
18) B	68) B	118) B	168) A
19) D	69) A	119) B	169) C
20) B	70) C	120) D	170) D
21) D	71) C	121) D	171) B
22) A	72) C	122) C	172) A
23) A	73) D	123) D	173) D
24) B	74) D	124) C	174) B
25) A	75) B	125) D	175) A
26) C	76) A	126) A	176) D
27) A	77) B	127) A	177) D
28) A	78) C	128) B	178) B
29) A	79) B	129) C	179) B
30) A	80) A	130) C	180) D
31) C	81) C	131) C	181) A
32) B	82) A	132) D	182) C
33) B	83) C	133) C	183) C
34) B	84) B	134) A	184) A
35) D	85) B	135) C	185) B
36) A	86) C	136) B	186) B
37) B	87) D	137) C	187) C
38) D	88) B	138) C	188) B
39) B	89) C	139) A	189) B
40) A	90) A	140) D	190) D
41) A	91) D	141) D	191) B
42) C	92) A	142) A	192) D
43) C	93) C	143) C	193) B
44) B	94) A	144) A	194) C
45) D	95) C	145) D	195) C
46) D	96) C	146) C	196) B
47) D	97) B	147) B	197) C
48) D	98) D	148) B	198) C
49) A	99) A	149) A	199) C
50) A	100) B	150) A	200) D

201) D	251) B	298) C	348) A
202) B	252) C	299) B	349) A
203) D	253) D	300) A	350) C
204) B	254) B	301) C	351) C
205) A	255) B	302) A	352) C
206) C	256) D	303) A	353) A
207) D	257) C	304) D	354) A
208) A	258) D	305) B	355) D
209) C	259) D	306) D	356) A
210) D	260) A	307) D	357) D
211) D	261) A	308) C	358) D
212) C	262) B	309) A	359) B
213) D	263) A	310) A	360) A
214) A	264) C	311) A	361) C
215) D	265) D	312) C	362) B
216) A	266) C	313) D	363) B
217) A	267) C	314) C	364) A
218) D	268) D	315) C	365) C
219) B	269) A	316) B	366) D
220) A	270) B	317) B	367) A
221) C	271) C	318) A	368) B
222) C	272) D	319) C	369) B
223) C	273) A	320) D	370) A
224) D	274) C	321) A	371) B
225) C	275) C	322) C	372) B
226) A	276) D	323) B	373) C
227) D	277) D	324) B	374) C
228) B	278) D	325) B	375) D
229) C	279) C	326) C	376) C
230) D	280) A	327) B	377) B
231) D	281) B	328) C	378) C
232) D		329) C	379) D
233) A	282) $V = \dfrac{\pi r^2 h}{3}$	330) A	380) B
234) C		331) C	381) B
235) A	283) $\theta = \dfrac{2A}{r^2}$	332) C	382) A
236) A		333) D	383) C
237) A	284) A	334) B	384) C
238) C	285) B	335) B	385) B
239) A	286) B	336) C	386) C
240) C	287) C	337) A	387) C
241) B	288) D	338) C	388) A
242) A	289) B	339) B	389) C
243) A	290) A	340) B	390) B
244) A	291) D	341) C	391) A
245) B	292) B	342) B	392) A
246) B	293) B	343) B	393) B
247) A	294) D	344) D	394) D
248) B	295) B	345) A	395) B
249) C	296) B	346) B	396) D
250) B	297) A	347) C	397) C

398) D
399) D
400) B
401) A
402) C
403) C
404) C
405) D
406) B
407) D
408) B
409) D
410) B
411) C
412) D
413) B
414) B
415) C
416) D
417) C
418) B
419) B
420) B
421) D
422) C
423) D
424) D
425) C