Test Bank for College Algebra and Trigonometry 4th Edition by Ratti

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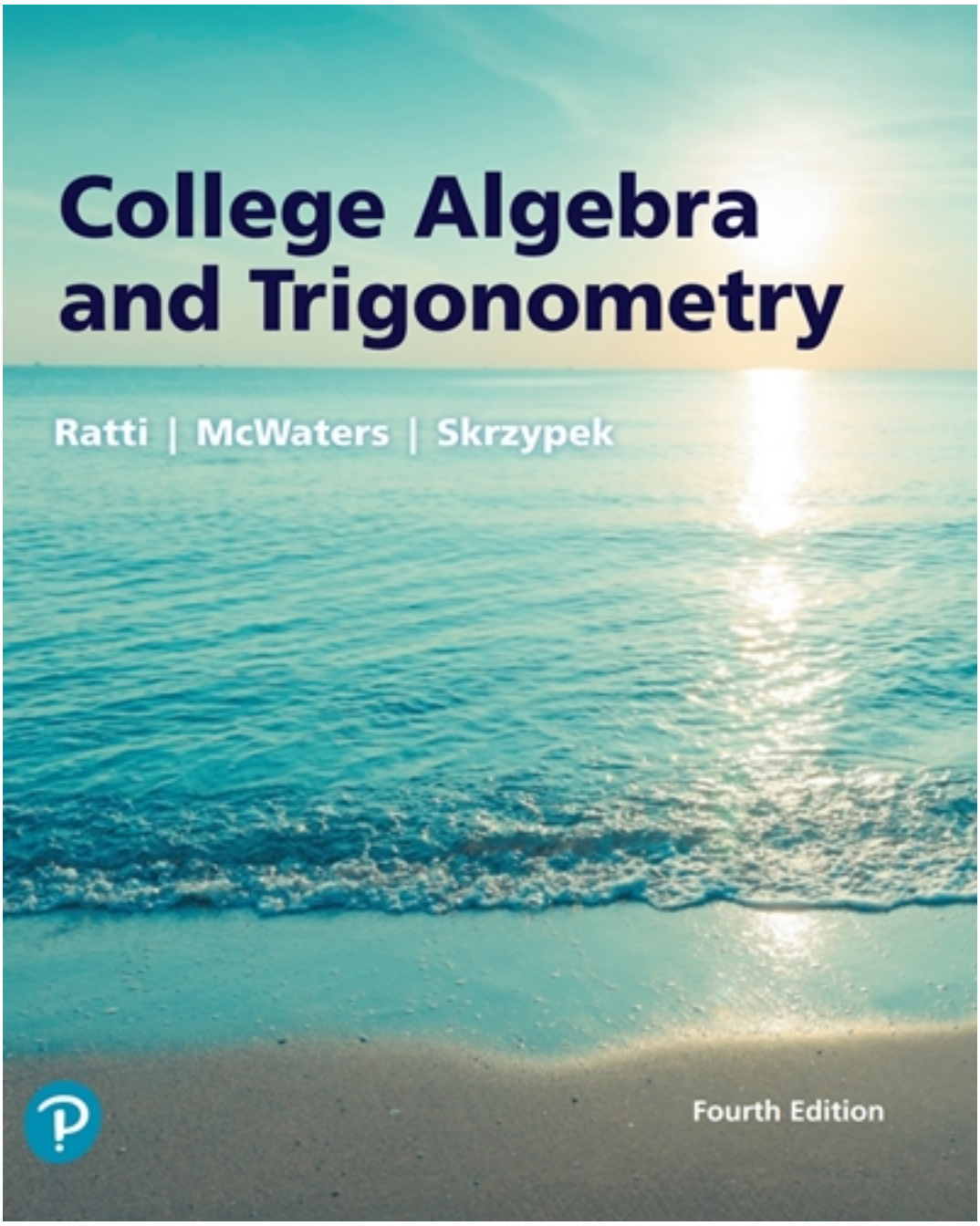


Test Bank

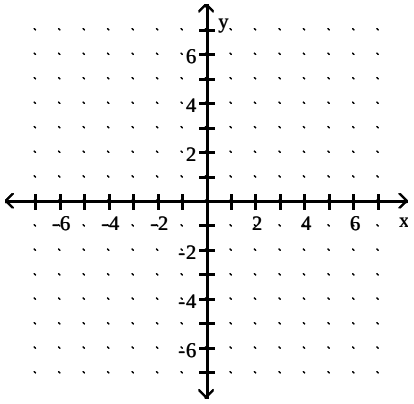
Exam

Name_____

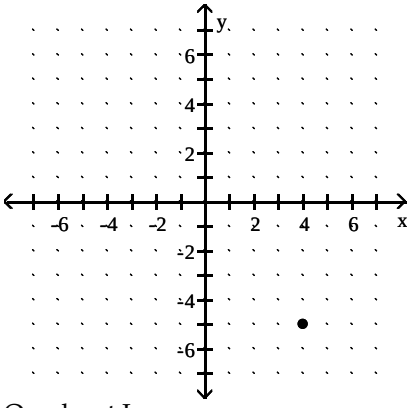
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Plot the point and state the quadrant, if any, in which the point is located.

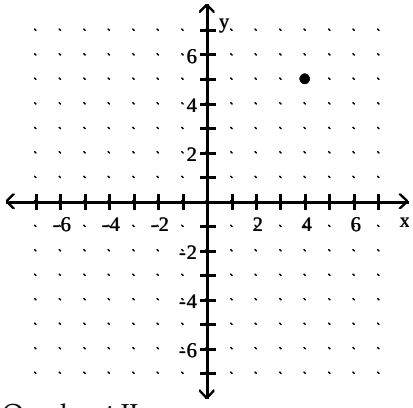
1) (4, 5) 1) _____



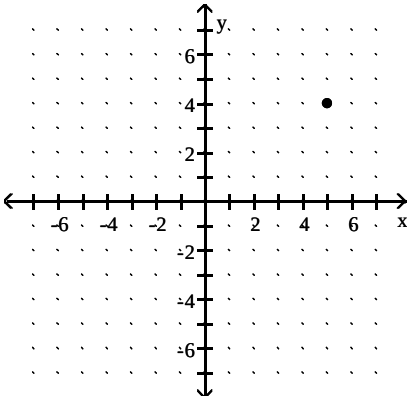
A) Quadrant IV



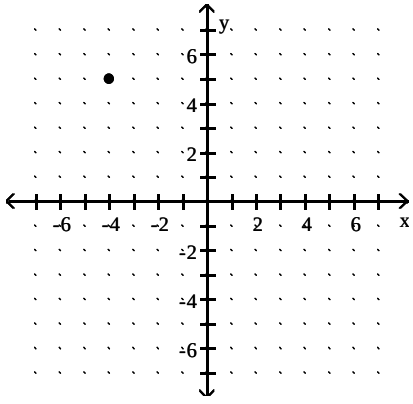
B) Quadrant I



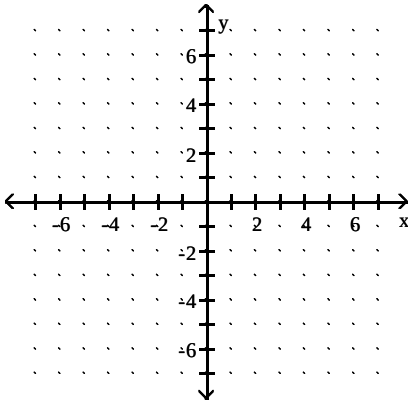
C) Quadrant I



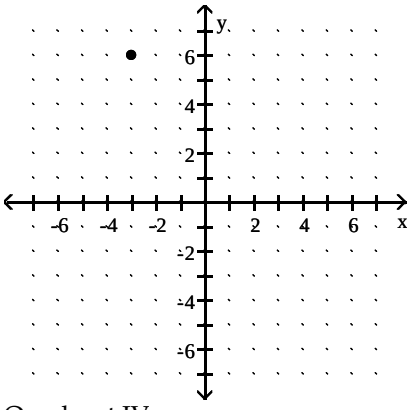
D) Quadrant II



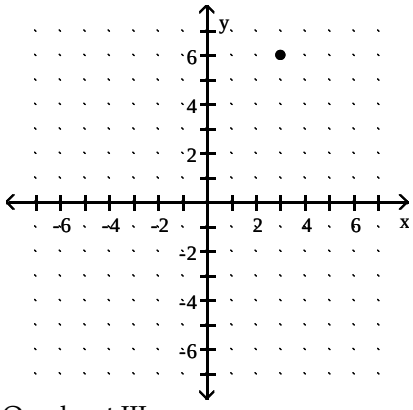
2) (–3, 6) 2) _____



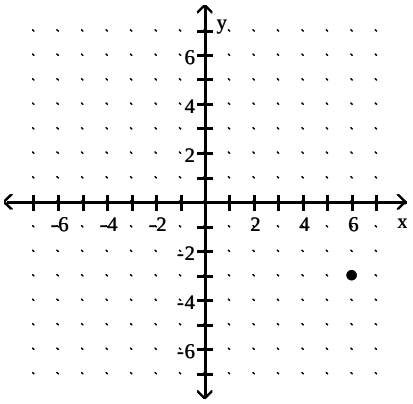
A) Quadrant II



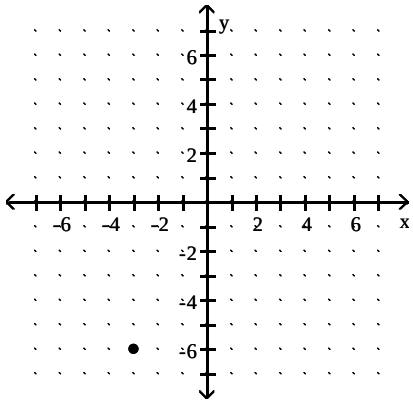
B) Quadrant I



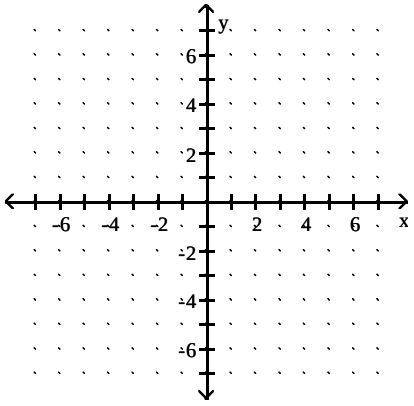
C) Quadrant IV



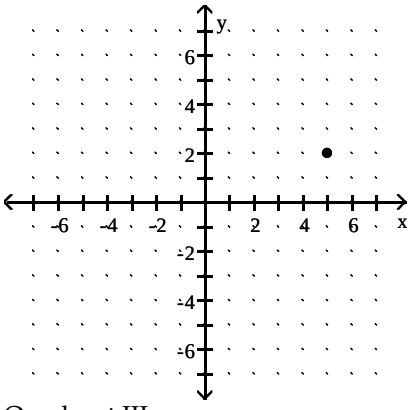
D) Quadrant III



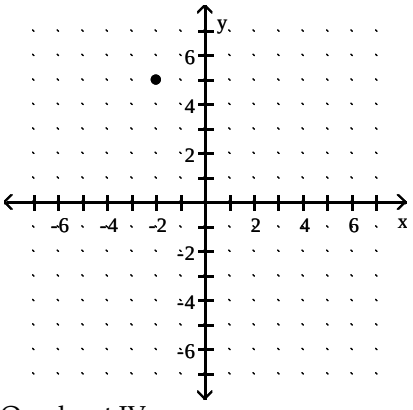
3) (5, –2) 3) _____



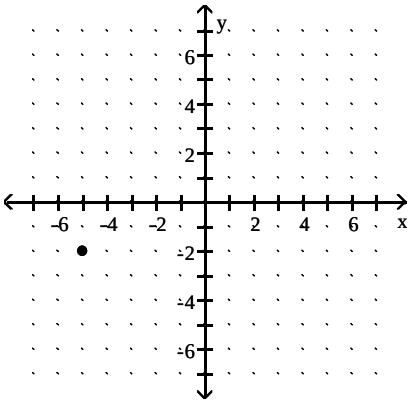
A) Quadrant I



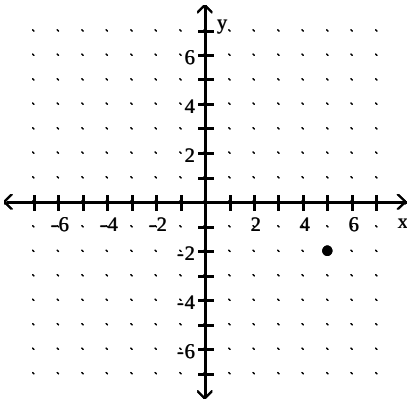
B) Quadrant II



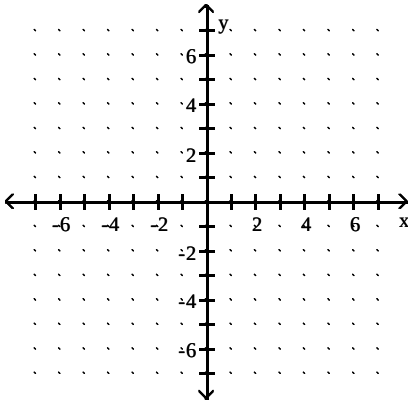
C) Quadrant III



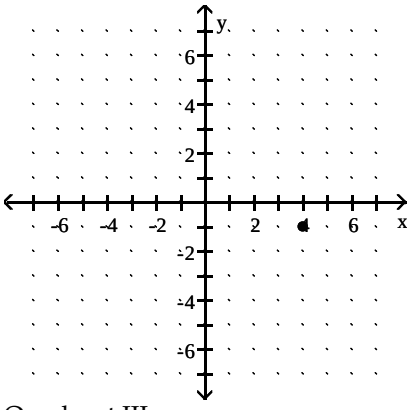
D) Quadrant IV



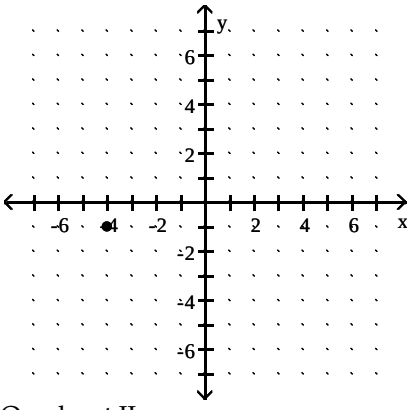
4) (–4, –1) 4) _____



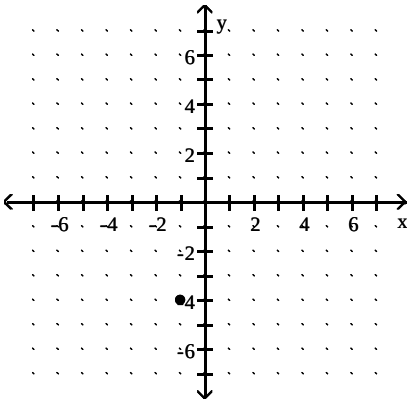
A) Quadrant IV



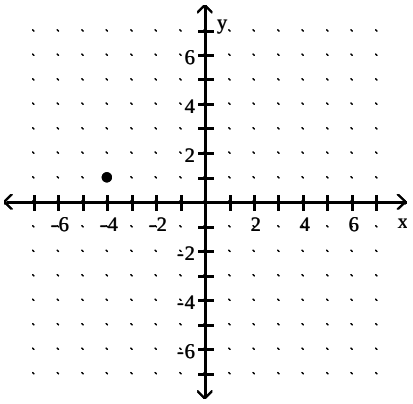
B) Quadrant III



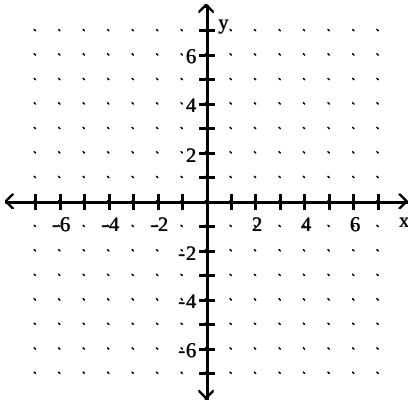
C) Quadrant III



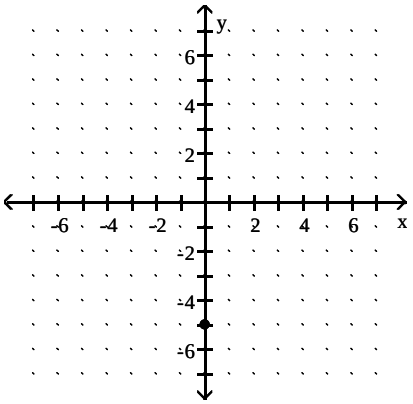
D) Quadrant II



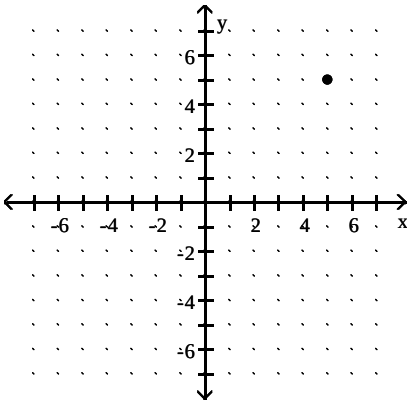
5) (0, 5) 5) _____



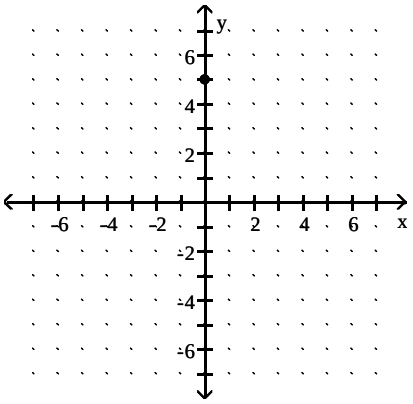
A) y-axis



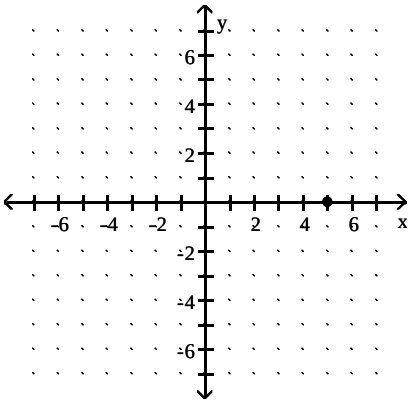
B) Quadrant I



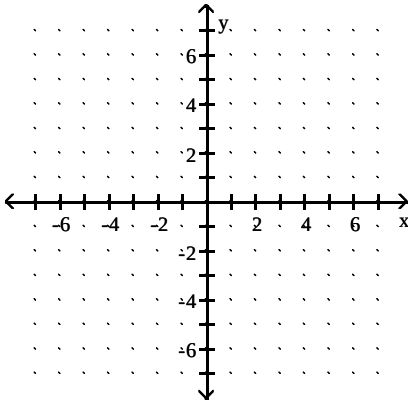
C) y-axis



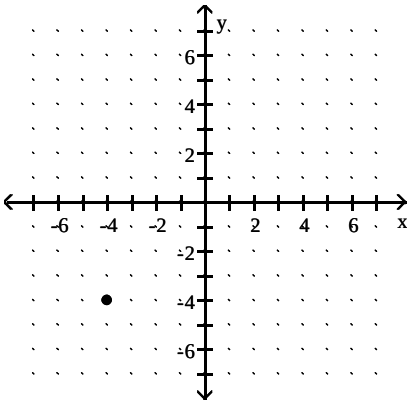
D) x-axis



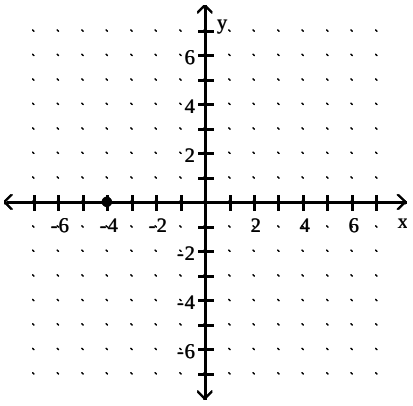
6) (–4, 0) 6) _____



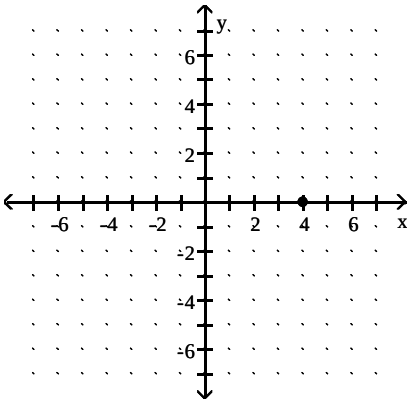
A) Quadrant I



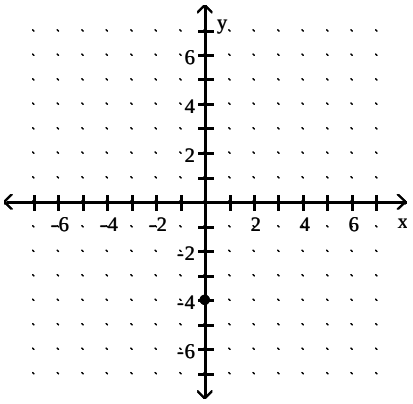
B) x–axis



C) x–axis



D) y–axis



Find the distance between P and Q.

7) P(–5, 1), Q(–11, 9) 7) _____

A) 100 B) 11 C) 10 D) 20

8) P(5, 3), Q(–2, –3) 8) _____

A) 42 B) $\sqrt{13}$ C) $\sqrt{85}$ D) 1

9) P(4, –2), Q(2, –6) 9) _____

A) $12\sqrt{3}$ B) 2 C) $2\sqrt{5}$ D) 12

10) P(–3, –4), Q(6, –7) 10) _____

A) $3\sqrt{10}$ B) 72 C) $72\sqrt{2}$ D) 12

11) P(x – z, p), Q(x + z, p) 11) _____

A) $2|z|$ B) $|z|$ C) $|x^2 - p^2|$ D) $2|x^2 - p^2|$

12) P(k, m), Q(m, k) 12) _____

A) $\sqrt{2}|k - m|$ B) $2|k + m|$ C) $\sqrt{2}|k + m|$ D) $2|k - m|$

Find the coordinates of the midpoint of the line segment PQ.

13) P(7, 1), Q(1, 4) 13) _____

A) (8, 5) B) $\left(4, \frac{5}{2}\right)$ C) $\left(\frac{5}{2}, 4\right)$ D) (6, –3)

14) P(–8, –8), Q(6, –4) 14) _____

A) (–2, –12) B) $(-1, -6)$ C) (–14, –4) D) $(-6, -1)$

15) P(5a, 8), Q(6a, 7) 15) _____

A) $\left(\frac{11a}{2}, \frac{15}{2}\right)$ B) (a, 1) C) (11a, 15) D) $\left(\frac{15a}{2}, \frac{11}{2}\right)$

16) P(x – y, p), Q(x + y, p) 16) _____

A) (–y, 0) B) (x, p) C) (2x, 2p) D) (p, x)

17) P(x, y), Q(y, x) 17) _____

A) $\left(\frac{xy}{2}, \frac{xy}{2}\right)$ B) (x + y, x + y) C) (xy, xy) D) $\left(\frac{x+y}{2}, \frac{x+y}{2}\right)$

Determine whether the given points are collinear.

18) (3, –7), (–3, –1), (–4, 0) 18) _____

A) Yes B) No

19) (4, –13), (5, –15), (–2, 9) 19) _____

A) Yes B) No

Identify the triangle PQR as isosceles, equilateral, or scalene.

20) P(0, 0), Q(6, –7), R(–1, –13) 20) _____

A) Isosceles B) Scalene C) Equilateral

21) P(–5, 5), Q(–3, 2), R(–10, 2) 21) _____

A) Equilateral B) Scalene C) Isosceles

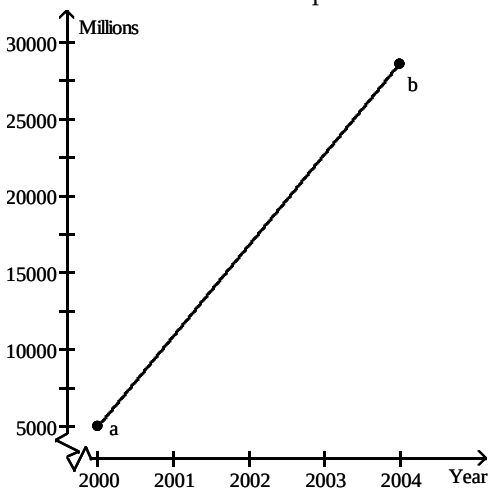
22) P(14, –14), Q(–14, 14), R($-14\sqrt{3}$, $-14\sqrt{3}$) 22) _____

A) Isosceles B) Scalene C) Equilateral

Solve the problem.

23) The graph shows the Total Gross Revenue (in millions of dollars) of Top 100 Internet Companies in t 23) _____
United States between 2000 and 2004. Use the midpoint formula to estimate the revenue for 2002.

Total Gross Revenue of Top 100 Internet Companies

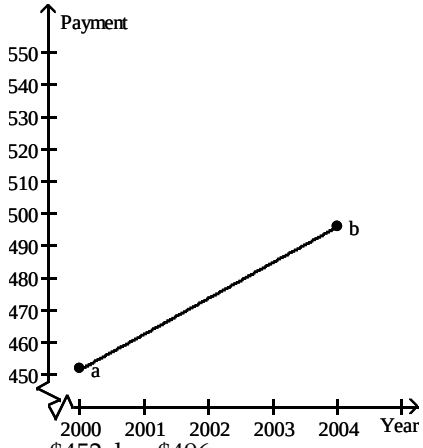


a = 5000 million dollars; b = 28,600 million dollars

A) 16,800 million dollars
B) 66,000 million dollars
C) 17,500 million dollars
D) 23,600 million dollars

24) The graph shows an idealized linear relationship for the average monthly payments (in dollars) to r 24) _____
from 2000 through 2004. Use the midpoint formula to estimate the payment for 2002.

Average Monthly Payments to Retirees



a = $452; b = $496

A) $22
B) $500
C) $474
D) $496

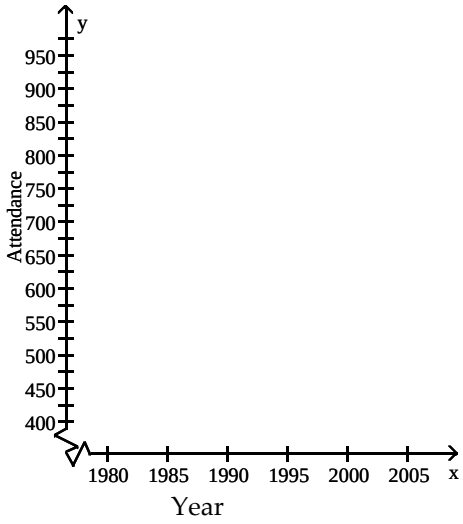
25) The table lists how financial aid income cutoffs (in dollars) for a family of four have changed over ti 25) _____
the midpoint formula to approximate the financial aid cutoff for 1985.

Year	Income (in dollars)
1960	21,000
1970	27,000
1980	33,000
1990	39,000
2000	45,000

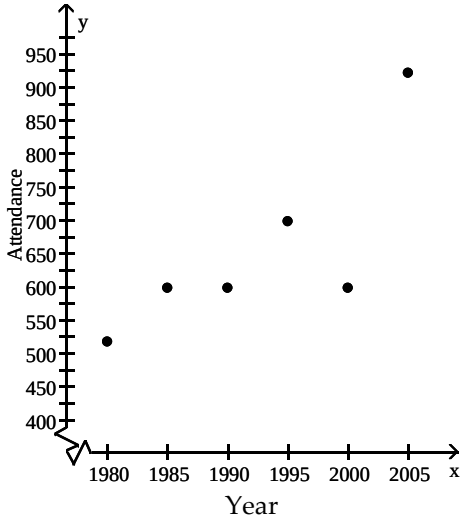
A) $57,000 B) $36,000 C) $21,000 D) $18,000

26) The table shows the total yearly attendance at home football games in thousands. The attendance nu 26) _____
are rounded to the nearest thousand. Plot the data in a Cartesian coordinate system.

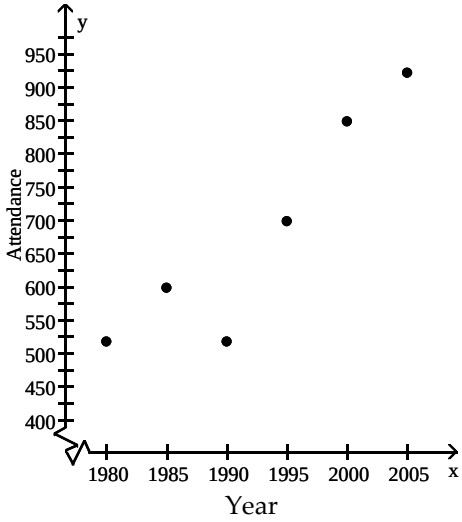
Year	Attendance
1980	518
1985	599
1990	698
1995	769
2000	849
2005	922



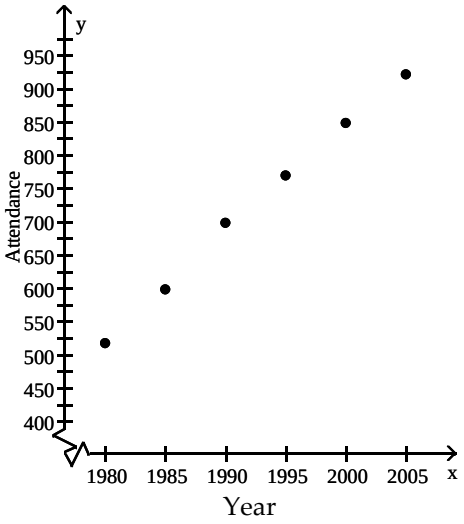
A)



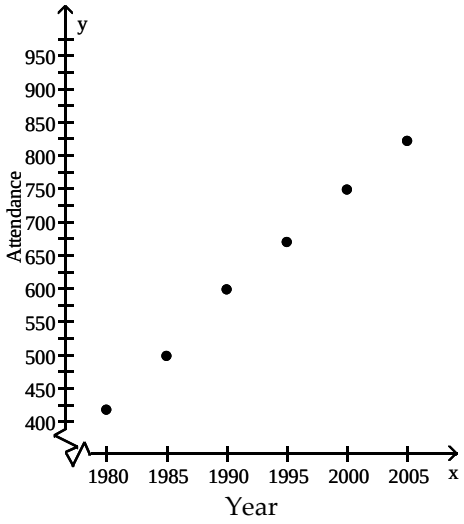
B)



C)



D)



27) A family is driving from Algebraville to Geometry City to Trig Town. With reference to the origin, Algebraville is located at (2, 2), Geometry City at (8, 11), and Trig Town at (20, 4), all numbers being in 1000–mile units. Find the distance traveled by the family. If necessary, round your answer to the nearest whole number. 27) _____

A) 10,817 mi B) 25 mi C) 24,709 mi D) 13,892 mi

28) A family is driving from Algebraville to Geometry City to Trig Town. With reference to the origin, Algebraville is located at (2, 3), Geometry City at (8, 10), and Trig Town at (17, 3), all numbers being in 1000–mile units. Find the distance from Algebraville directly to Trig Town. If necessary, round your answer to the nearest whole number. 28) _____

A) 16,553 mi B) 9220 mi C) 15 mi D) 15,000 mi

Provide an appropriate response.

29) Determine the quadrants in which the given point (x, y) may lie when $xy < 0$. 29) _____

A) I or II B) II or IV C) I or III D) II or III

30) Determine the quadrants in which the given point (x, y) may lie when $y > 0$. 30) _____

A) I or IV B) III or IV C) I or II D) II or III

31) Find all the points having an x–coordinate of 9 whose distance from the point (3, –2) is 10. 31) _____

A) (9, 13), (9, –7) B) (9, 2), (9, –4) C) (9, –12), (9, 8) D) (9, 6), (9, –10)

32) The points (3, 4), (6, 7), (8, –1), and (11, 2) are the vertices of a quadrilateral. Is the quadrilateral a rectangle? 32) _____

A) Yes B) No

33) The points (–2, 7), (1, 6), (3, –2), and (6, 1) are the vertices of a quadrilateral. Is the quadrilateral a rectangle? 33) _____

A) Yes B) No

34) Graph the rectangle with vertices (2, 3), (5, 6), (7, –2), and (10, 1). Are the midpoints of the sides of the rectangle the vertices of a rectangle? 34) _____

A) Yes B) No

35) Graph the rectangle with vertices (0, 3), (3, 6), (5, –2), and (8, 1). Are the midpoints of the sides the vertices of a square? 35) _____

A) Yes B) No

Determine whether the given point is on the graph of the equation.

36) $y = 9x - 4; (-3, -31)$ 36) _____

A) Yes B) No

37) $3y = -6x + 9; \left(0, \frac{2}{3}\right)$ 37) _____

A) Yes B) No

38) $2x + 2y^2 = 20; (6, -2)$ 38) _____

A) Yes B) No

39) $y = \sqrt{x + 6}; (30, 6)$ 39) _____

A) Yes B) No

40) $y = \frac{8}{x}; \left(1, \frac{1}{8}\right)$ 40) _____

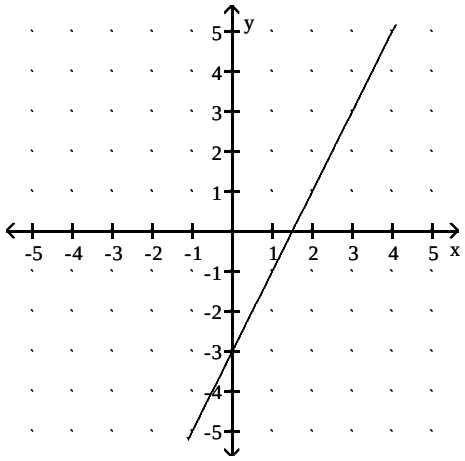
A) Yes B) No

41) $y^2 = 2x; (13, \sqrt{26})$ 41) _____

A) Yes B) No

Write the x– and y–intercepts of the graph.

42) 42) _____



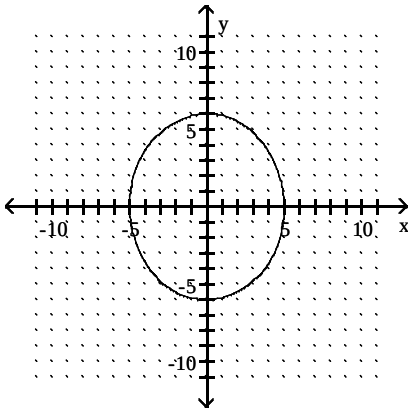
A) x–intercept: –3; y–intercept: $\frac{3}{2}$

B) x–intercept: –3; y–intercept: –3

C) x–intercept: $\frac{3}{2}$; y–intercept: –3

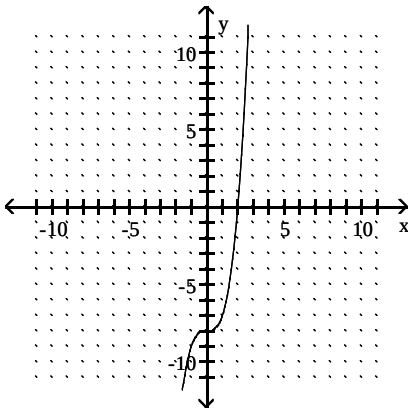
D) x–intercept: $\frac{3}{2}$; y–intercept: $\frac{3}{2}$

43) 43) _____



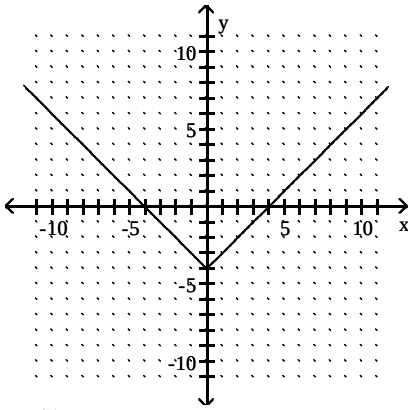
A) y–intercepts: 6, –6
B) x–intercepts: 5, –5; y–intercepts: 6, –6
C) x–intercepts: 6, –6; y–intercepts: 5, –5
D) x–intercepts: 5, –5

44) 44) _____



A) x–intercept: 2; y–intercept: 8
B) x–intercept: –2; y–intercept: 8
C) x–intercept: –2; y–intercept: –8
D) x–intercept: 2; y–intercept: –8

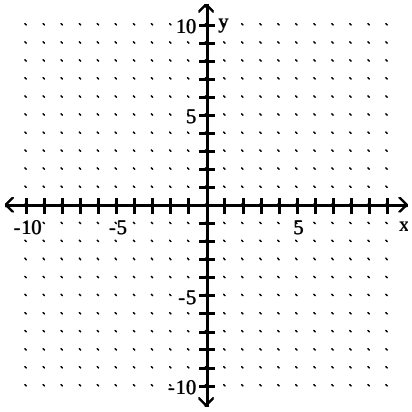
45) 45) _____



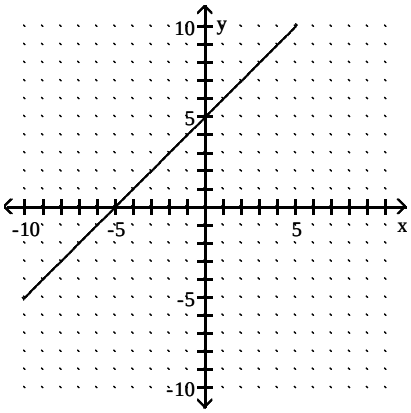
A) x–intercepts: 4, –4
B) y–intercept: –4
C) x–intercepts: 4, –4; y–intercept: –4
D) x–intercepts: 4, –4; y–intercept: 0

Graph the equation by plotting points.

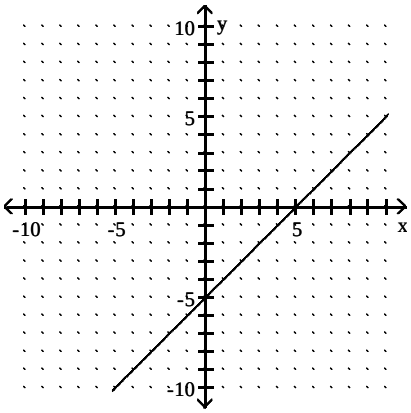
46) $y = x - 5$ 46) _____



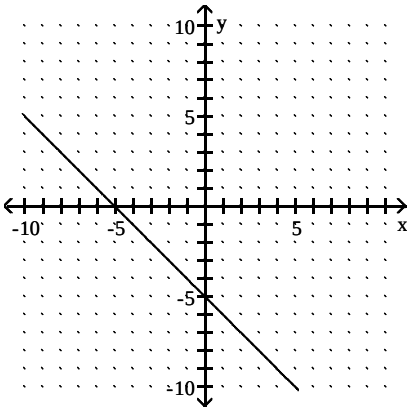
A)



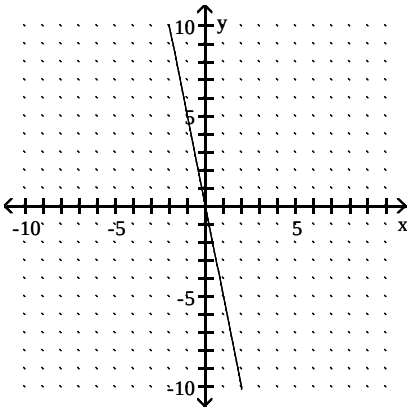
B)



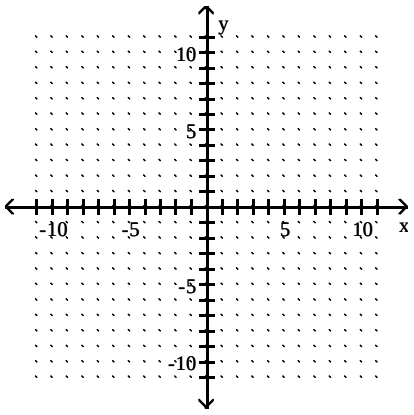
C)



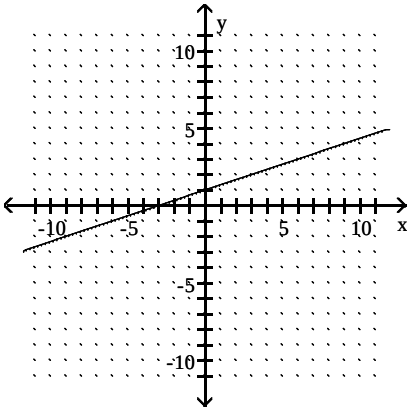
D)



47) $y = \frac{1}{3}x - 1$ 47) _____



A)



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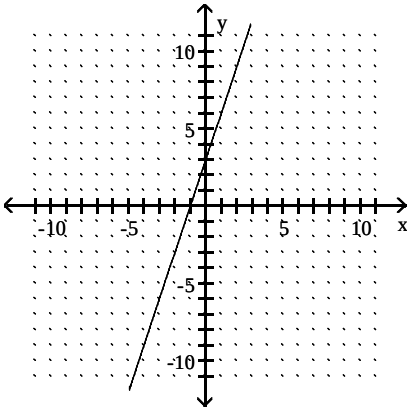
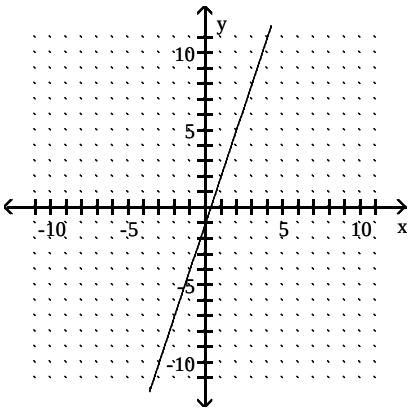


C)



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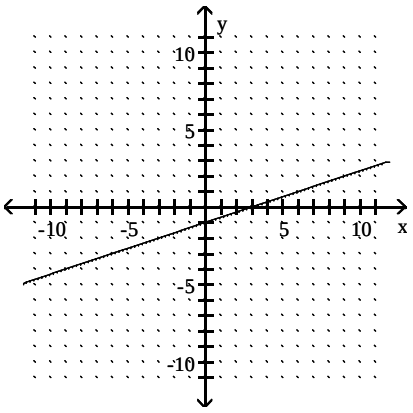
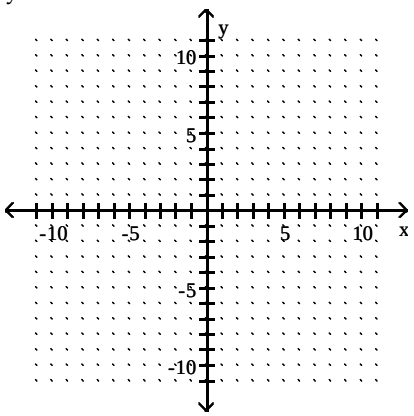
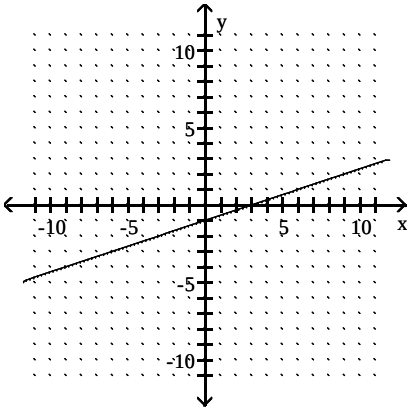


48) $y = 3x + 3$ 48) _____



A)



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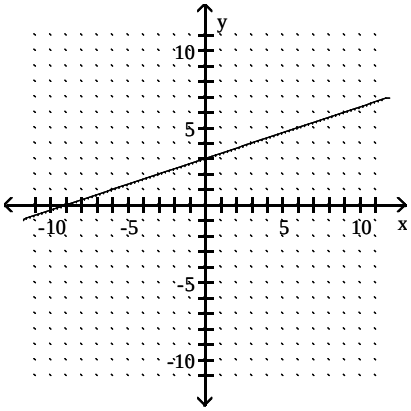
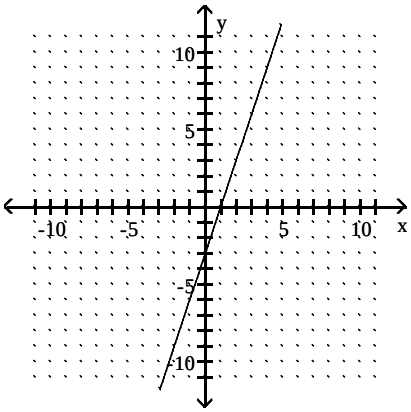
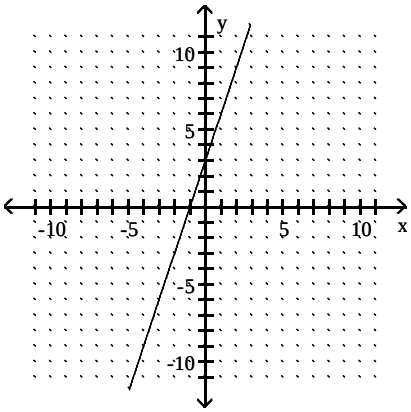


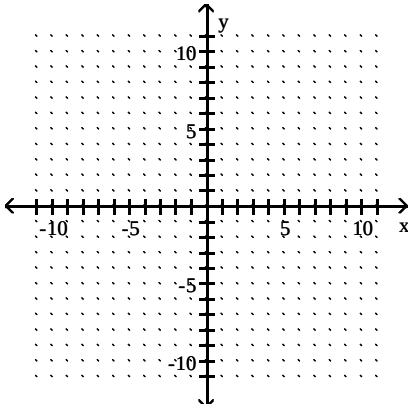
C)



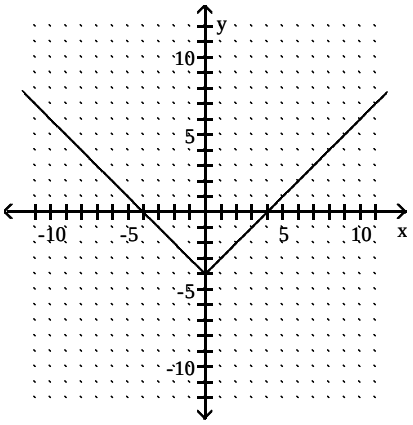
D)



49) $y = |x| - 4$ 49) _____



A)



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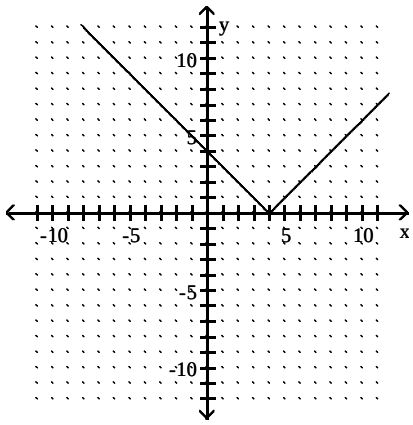
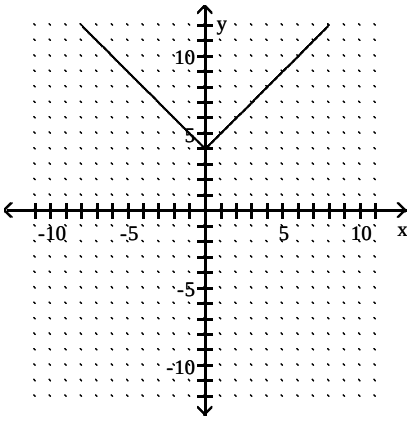
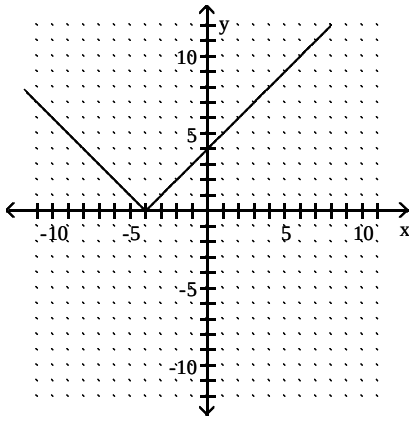


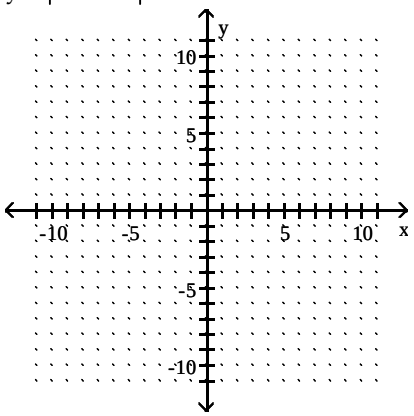
C)



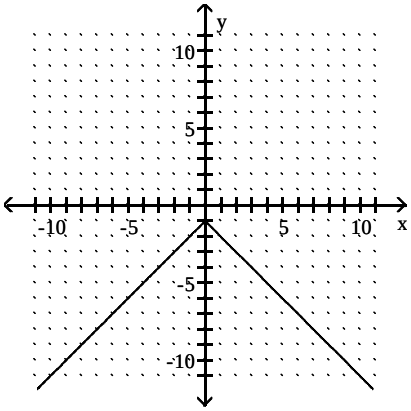
D)



50) $y = |-1 - x|$ 50) _____



A)



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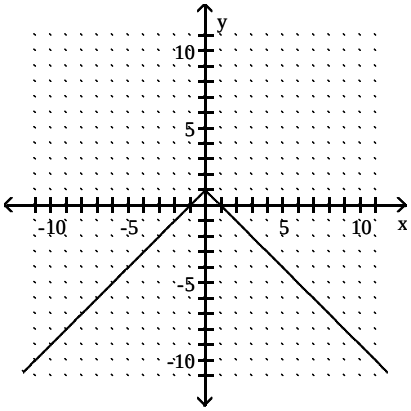
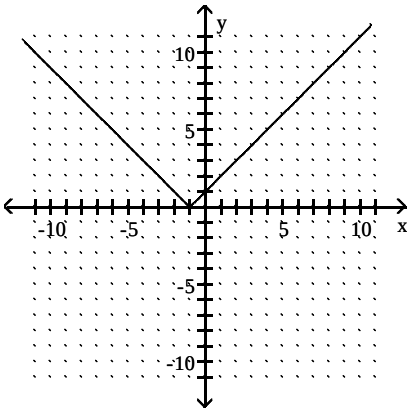
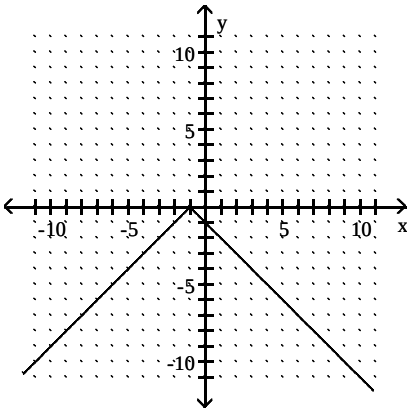


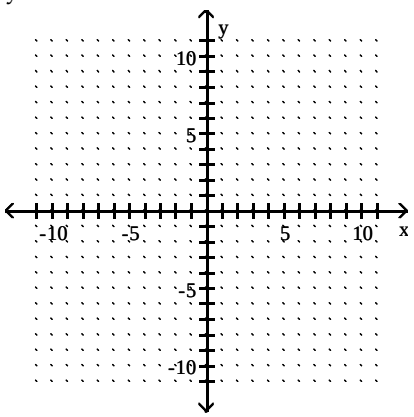
C)



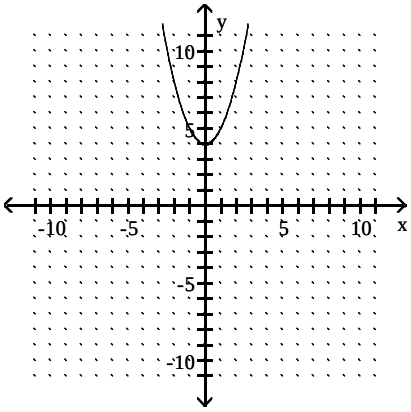
D)



51) $y = x^2 - 4$ 51) _____



A)



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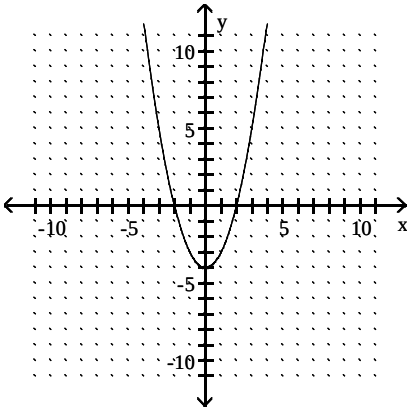
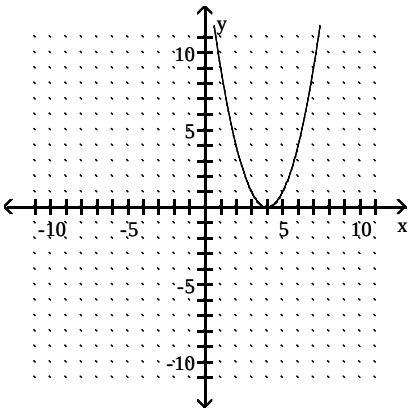
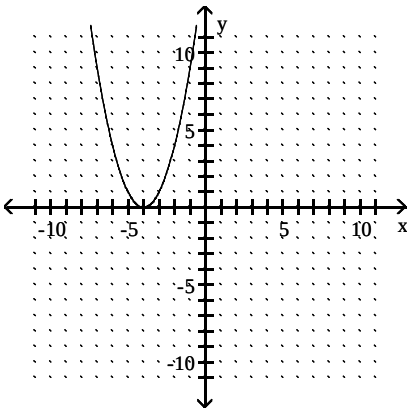


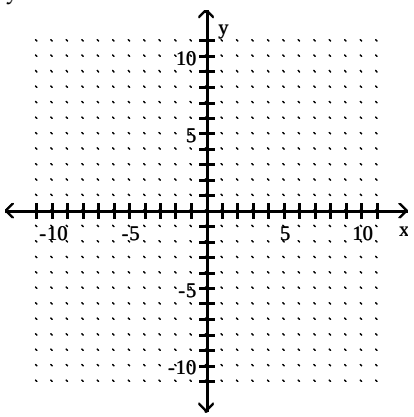
C)



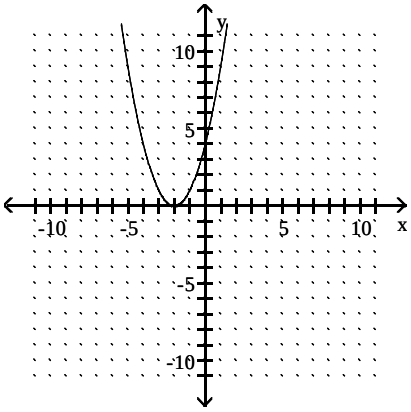
D)



52) $y = -x^2 - 2$ 52) _____



A)



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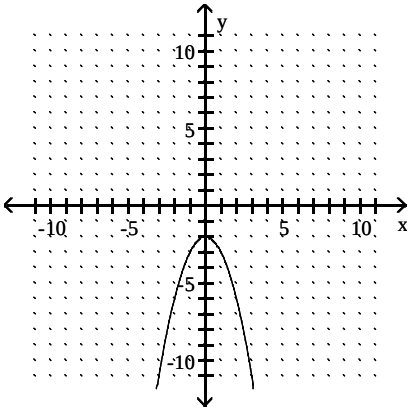
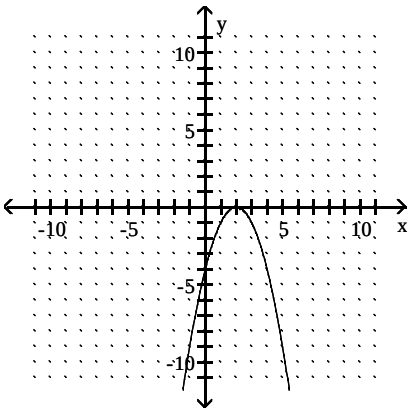
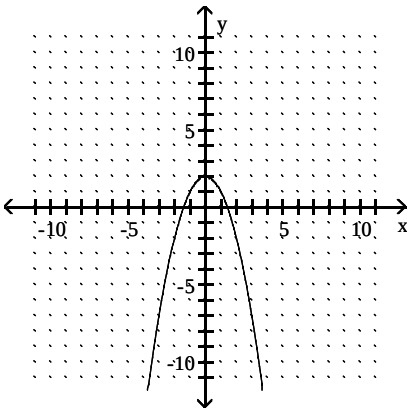


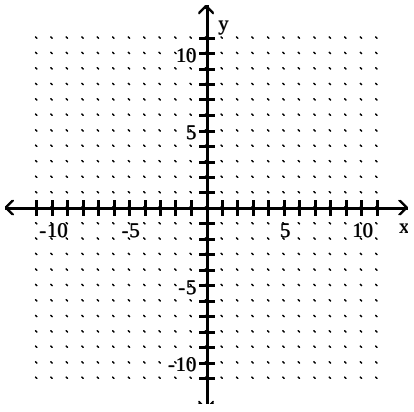
C)



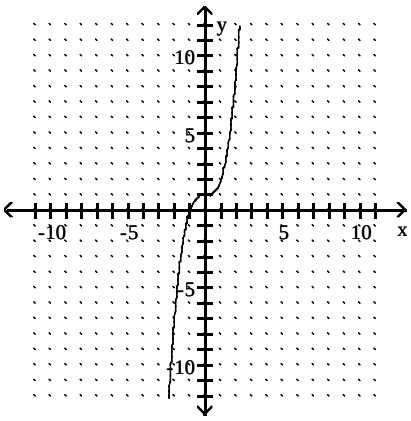
D)



53) $y = x^3 + 1$ 53) _____



A)



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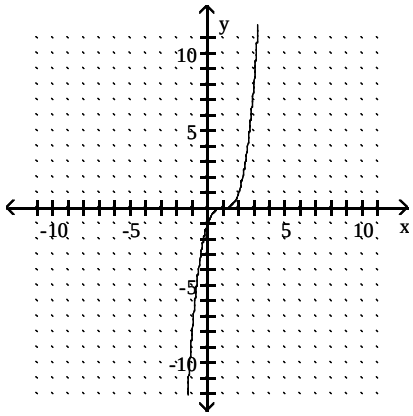

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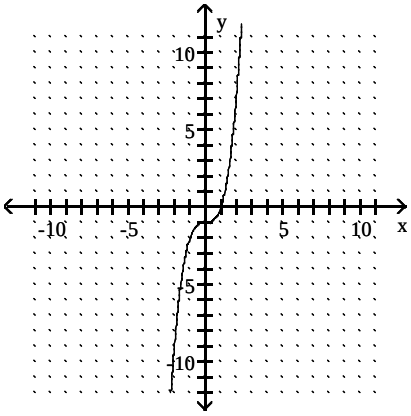
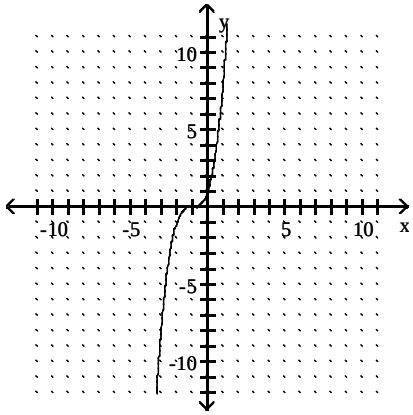
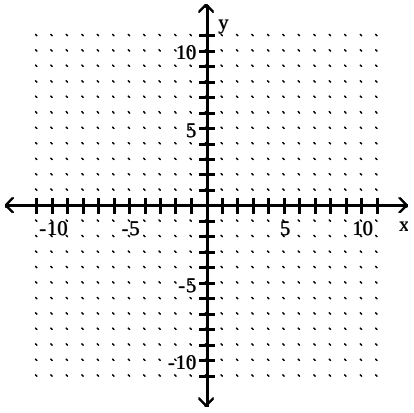


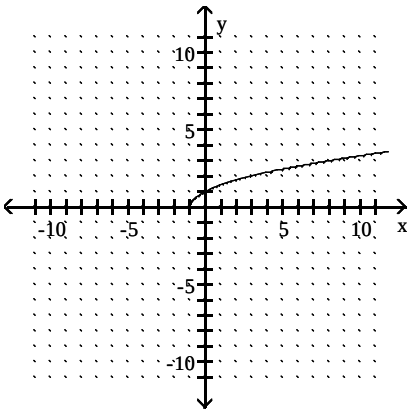
D)



54) $y = \sqrt{x - 1}$ 54) _____



A)



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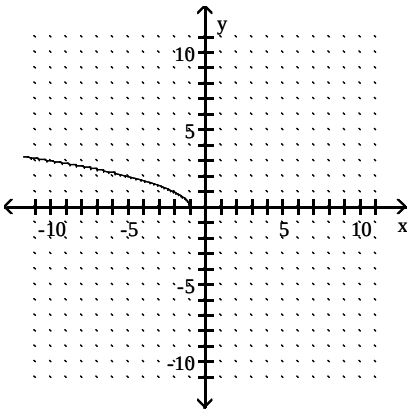
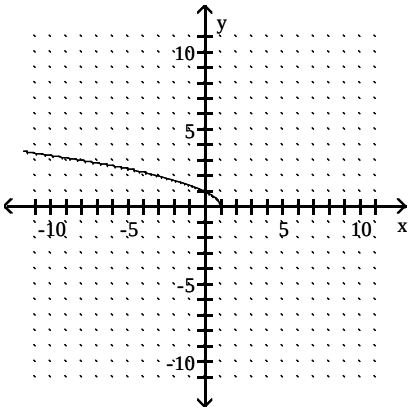
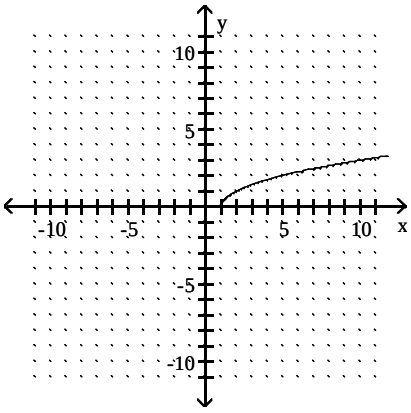


C)



D)



Find the x– and y–intercepts of the graph of the equation.

55) $15y - 5x = -10$ 55) _____

A) x–intercept: $-\frac{2}{3}$; y–intercept: 2

B) x–intercept: $-\frac{2}{3}$; y–intercept: –2

C) x–intercept: –2; y–intercept: $-\frac{2}{3}$

D) x–intercept: 2; y–intercept: $-\frac{2}{3}$

56) $3x - 12y = 12$ 56) _____

A) x–intercept: 4; y–intercept: –1

B) x–intercept: 1; y–intercept: –4

C) x–intercept: –4; y–intercept: 1

D) x–intercept: –1; y–intercept: 4

57) $9x^2 + y^2 = 9$ 57) _____

A) x–intercepts: –1, 1; y–intercepts: –9, 9
B) x–intercepts: –1, 1; y–intercepts: –3, 3
C) x–intercepts: –9, 9; y–intercepts: –1, 1
D) x–intercepts: –3, 3; y–intercepts: –1, 1

58) $y = x^2 + 4x + 4$ 58) _____

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

59) $\frac{x}{2} + \frac{y}{3} = 3$ 59) _____

A) x–intercept: 9; y–intercept: 6
B) x–intercept: 3; y–intercept: 2
C) x–intercept: 6; y–intercept: 9
D) x–intercept: 5; y–intercept: 6

60) $x = y^2 + 3y + 2$ 60) _____

A) x–intercepts: –1, –2; y–intercept: 2
B) x–intercepts: 1, 2; y–intercept: –2
C) x–intercept: –2; y–intercepts: 1, 2
D) x–intercept: 2; y–intercepts: –1, –2

61) $y = \sqrt{64 - x^2}$ 61) _____

A) x–intercepts: –8, 8; y–intercept: 8
B) x–intercept: 8; y–intercepts: –8, 8
C) x–intercept: 8; y–intercept: –8
D) x–intercept: 8; y–intercept: 8

Test the equation for symmetry with respect to the x–axis, the y–axis, and the origin.

62) $y = 5x^2 + 5$ 62) _____

A) y–axis only
B) x–axis, y–axis, origin
C) x–axis only
D) origin only

63) $2x = 4y^2 - 1$ 63) _____

A) x–axis only
B) y–axis only
C) origin only
D) x–axis, y–axis, origin

64) $y = -7x^3 + 6x$ 64) _____

A) origin only B) x–axis, origin C) x–axis, y–axis D) x–axis only

65) $y = 6x^5 - 7x^3$ 65) _____

A) x–axis, y–axis, origin
B) origin only
C) y–axis only
D) no symmetry

66) $y = -4x^4 + 9x + 3$ 66) _____

A) x–axis only B) x–axis, origin C) no symmetry D) origin only

Specify the center and radius of the circle.

67) $(x + 8)^2 + (y + 6)^2 = 64$ 67) _____

A) center: (8, 6); radius: 8
B) center: (–6, –8); radius: 64
C) center: (–8, –6); radius: 8
D) center: (6, 8); radius: 64

68) $(x + 5)^2 + (y + 3)^2 = 36$ 68) _____

A) center: (3, 5); radius: 36
B) center: (5, 3); radius: 36
C) center: (–5, –3); radius: 6
D) center: (–3, –5); radius: 6

69) $(x + 1)^2 + (y - 4)^2 = 2$ 69) _____

A) center: (1, –4); radius: 2
B) center: (1, –4); radius: $\sqrt{2}$
C) center: (–1, 4); radius: $\sqrt{2}$
D) center: (–1, 4); radius: 2

70) $x^2 + y^2 + 4x - 12y + 15 = 0$ 70) _____

A) center: (6, –2); radius: 5
B) center: (2, –6); radius: 25
C) center: (–2, 6); radius: 5
D) center: (–6, 2); radius: 25

71) $x^2 + 18x + y^2 - 18y + 146 = 0$ 71) _____

A) center: (–9, 9); radius: 16
B) center: (–9, 9); radius: 4
C) center: (9, –9); radius: 16
D) center: (9, –9); radius: 4

72) $5x^2 + 5y^2 + 20x + 30y - 15 = 0$ 72) _____

A) center: (2, 3); radius: 16
B) center: (–3, –2); radius: 4
C) center: (–2, –3); radius: 4
D) center: (3, 2); radius: 16

Find the standard form of the equation of a circle that satisfies the given conditions.

73) Center at (–1, 0); radius 12 73) _____

A) $x^2 + (y + 1)^2 = 12$
B) $x^2 + (y - 1)^2 = 12$
C) $(x - 1)^2 + y^2 = 144$
D) $(x + 1)^2 + y^2 = 144$

74) Center at (0, –7); radius 1 74) _____

A) $(x + 7)^2 + y^2 = 1$ B) $(x - 7)^2 + y^2 = 1$ C) $x^2 + (y + 7)^2 = 1$ D) $x^2 + (y - 7)^2 = 1$

75) Center at (–10, –1); radius $\sqrt{17}$ 75) _____

A) $(x - 10)^2 + (y - 1)^2 = 17$
B) $(x + 1)^2 + (y + 10)^2 = 289$
C) $(x - 1)^2 + (y - 10)^2 = 289$
D) $(x + 10)^2 + (y + 1)^2 = 17$

76) Center (1, –2); passing through the point (4, 2) 76) _____

A) $(x - 1)^2 + (y + 2)^2 = 25$
B) $(x - 2)^2 + (y + 1)^2 = 9$
C) $(x + 2)^2 + (y - 1)^2 = 9$
D) $(x + 1)^2 + (y - 2)^2 = 25$

77) Center (22, 12); containing the origin 77) _____

A) $(x - 12)^2 + (y - 22)^2 = 25$
B) $(x - 22)^2 + (y - 12)^2 = 25$
C) $(x - 22)^2 + (y - 12)^2 = 628$
D) $(x - 12)^2 + (y - 22)^2 = 628$

78) Center (9, 8); touching the x–axis 78) _____

A) $(x - 9)^2 + (y - 8)^2 = 81$
B) $(x - 8)^2 + (y - 9)^2 = 81$
C) $(x - 8)^2 + (y - 9)^2 = 8$
D) $(x - 9)^2 + (y - 8)^2 = 64$

79) Center (18, 17); touching the y–axis 79) _____

A) $(x - 17)^2 + (y - 18)^2 = 18$

B) $(x - 18)^2 + (y - 17)^2 = 18$

C) $(x - 17)^2 + (y - 18)^2 = 324$

D) $(x - 18)^2 + (y - 17)^2 = 324$

80) Diameter with endpoints (5, 3) and (5, –3) 80) _____

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

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

C) $x^2 + (y - 3)^2 = 25$

D) $(x - 3)^2 + y^2 = 25$

81) Diameter with endpoints (–10, 6) and (0, 2) 81) _____

A) $(x + 5)^2 + (y - 4)^2 = 29$

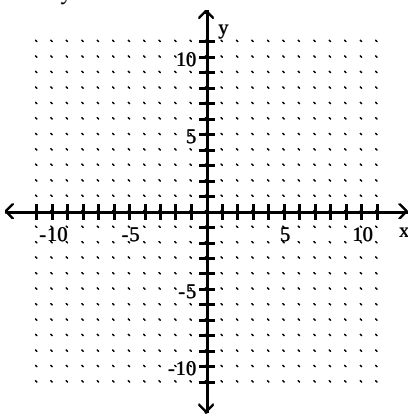
B) $(x + 5)^2 + y^2 = 4$

C) $(x - 4)^2 + (y + 5)^2 = 29$

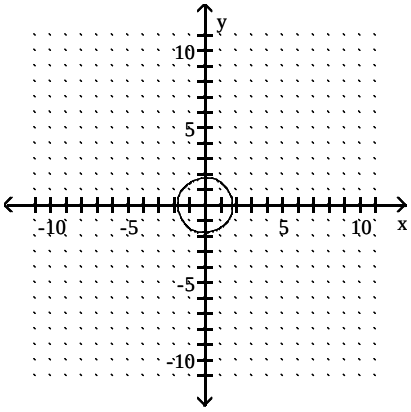
D) $x^2 + (y - 4)^2 = 25$

Graph the circle.

82) $x^2 + y^2 = 100$ 82) _____



A)



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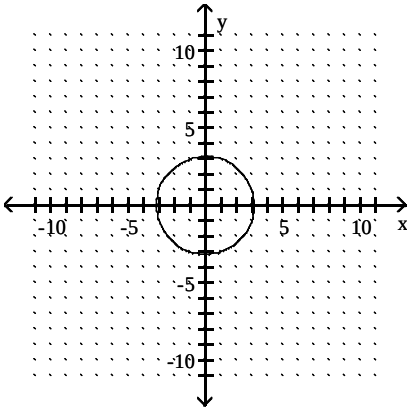

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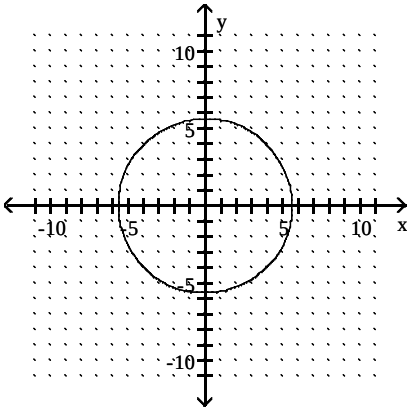
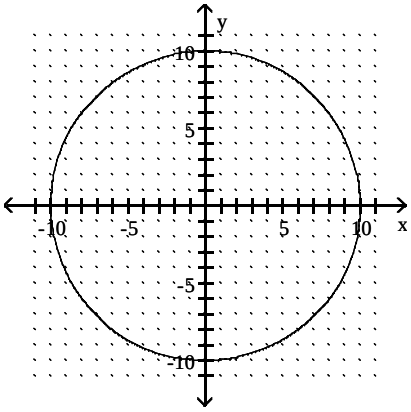
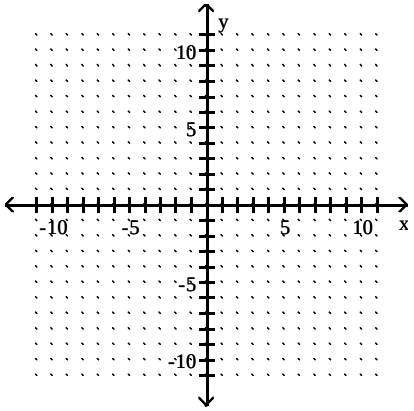


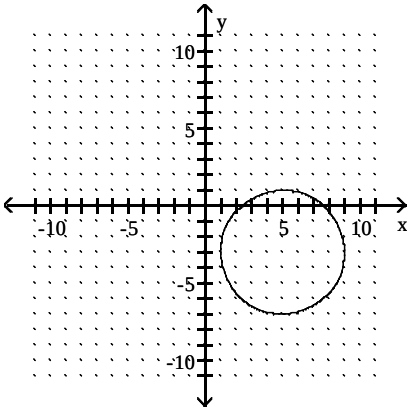
D)



83) $(x - 5)^2 + (y - 3)^2 = 16$ 83) _____



A)



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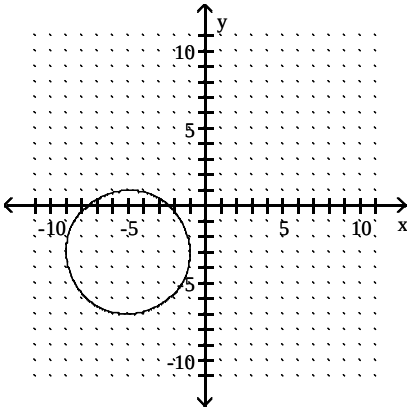

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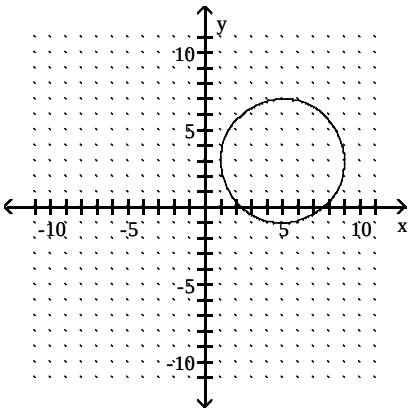

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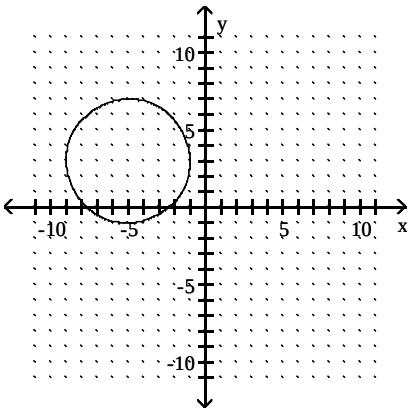
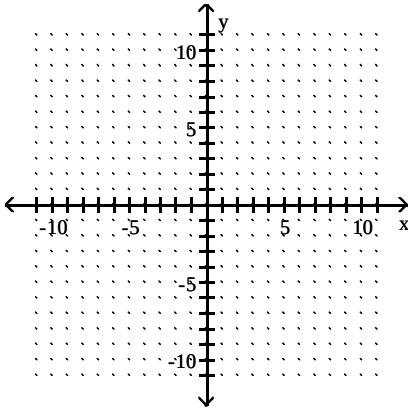
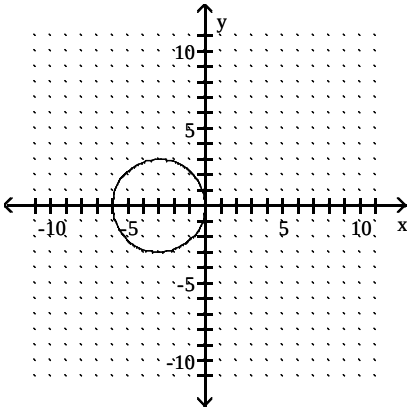


84) $x^2 + (y - 3)^2 = 9$ 84) _____



A)



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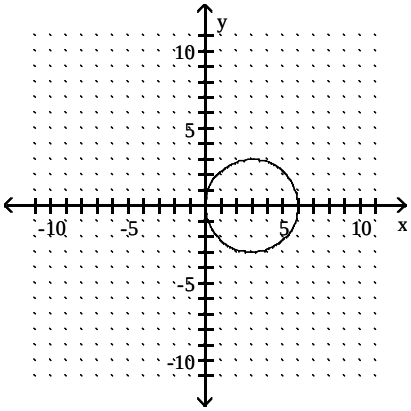
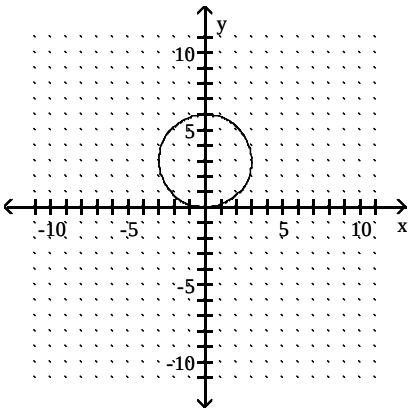


C)



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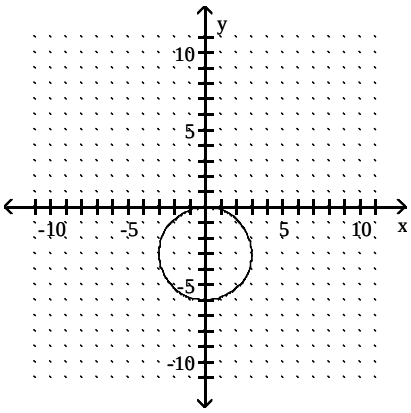
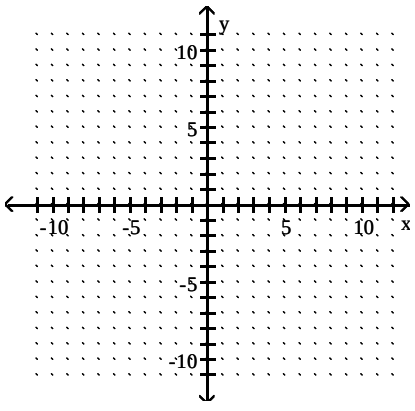
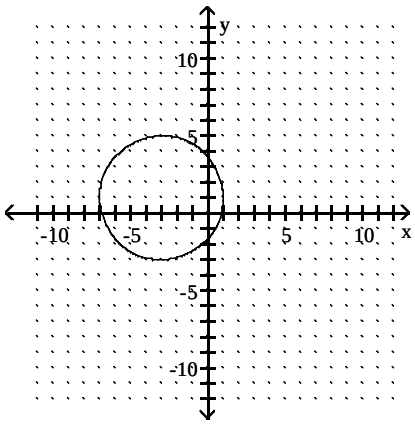


85) $(x - 3)^2 + (y + 1)^2 = 16$ 85) _____



A)



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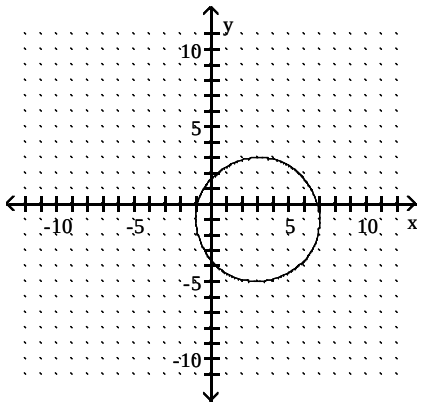

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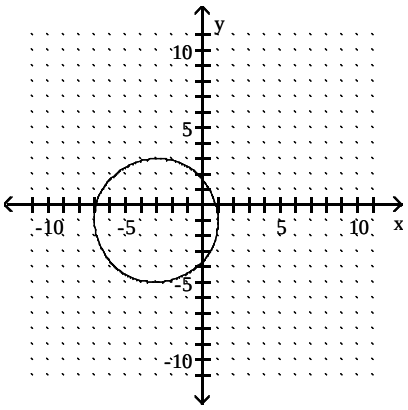

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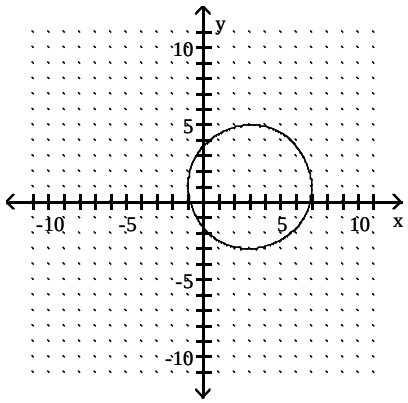
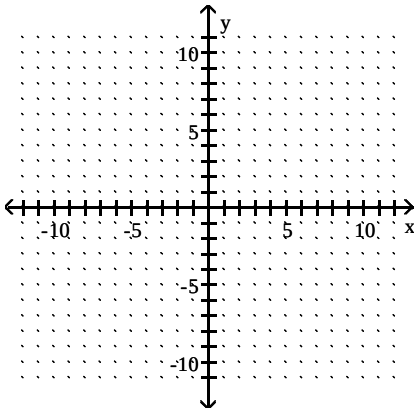
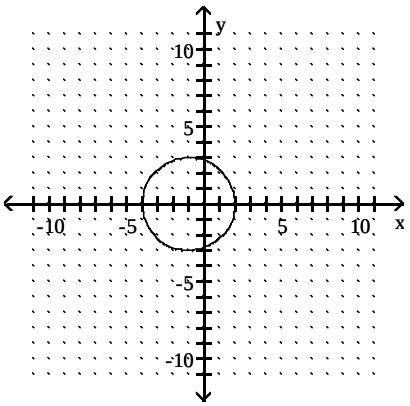


86) $(x - 1)^2 + y^2 = 9$ 86) _____



A)



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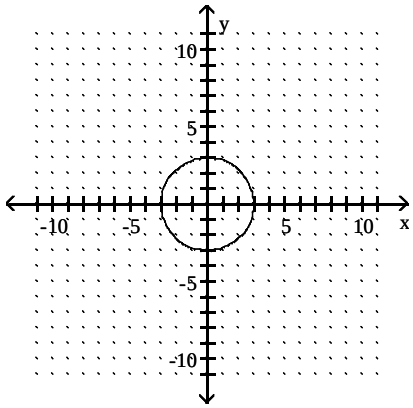

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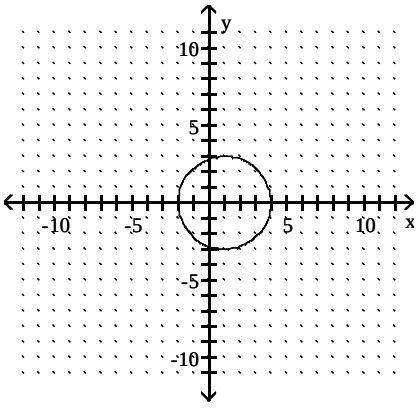

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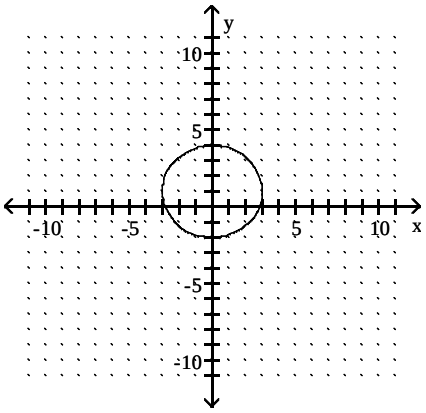
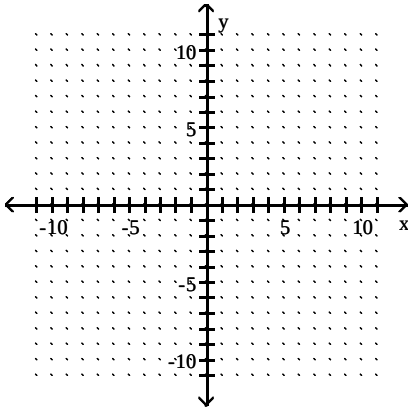
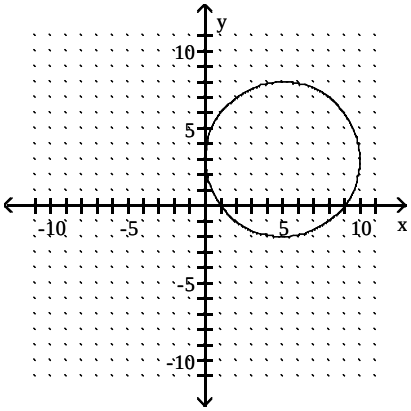


87) $x^2 + y^2 - 10x - 6y + 9 = 0$ 87) _____



A)



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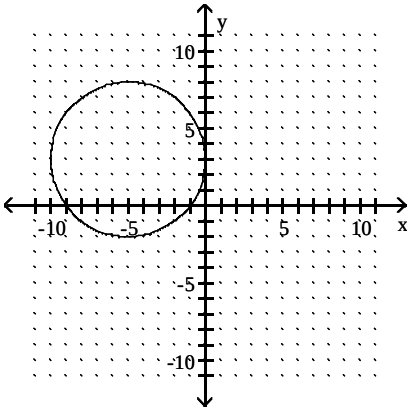
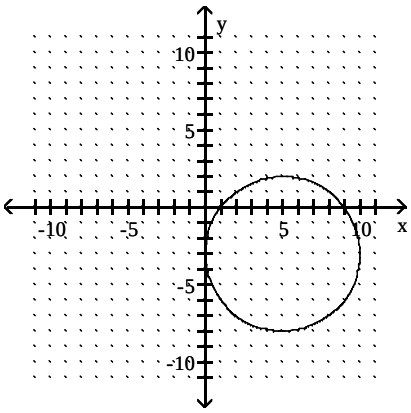
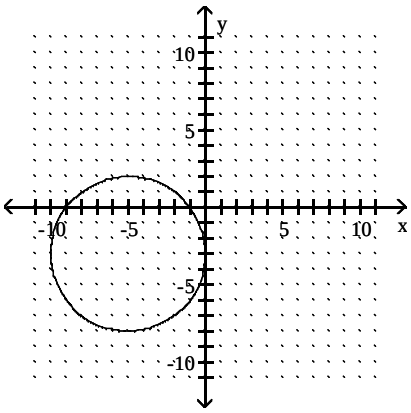


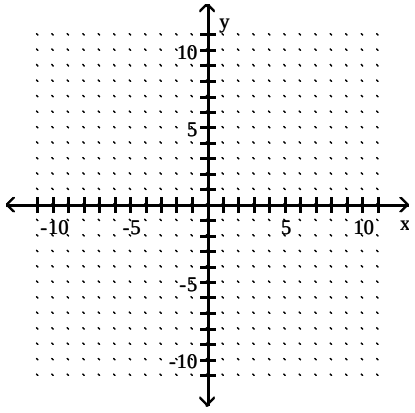
C)



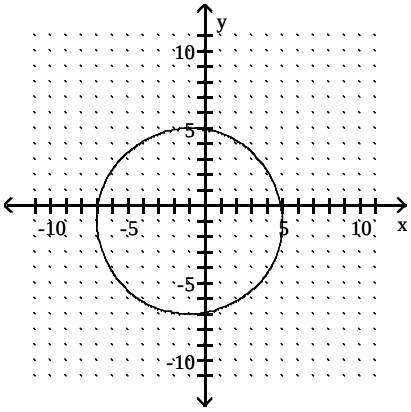
D)



88) $x^2 + y^2 + 2x + 2y - 34 = 0$ 88) _____



A)



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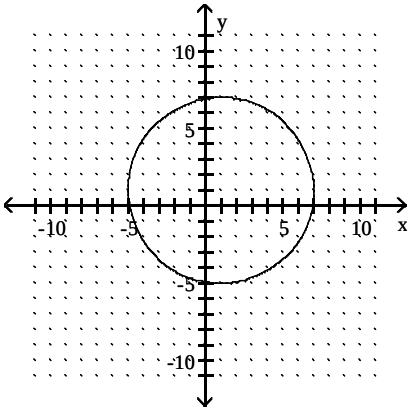

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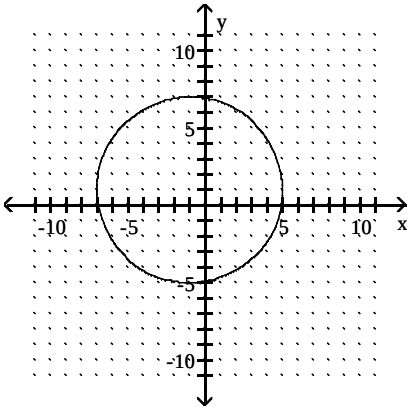
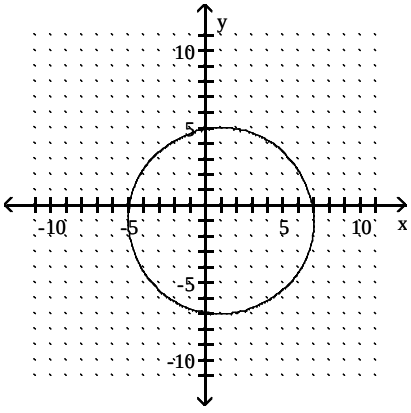


D)



Find: a. The center and radius of the circle. b. The x– and y–intercepts of the graph of the circle.

89) $x^2 + y^2 + 2x - 2y - 4 = 0$ 89) _____

A) a. center = (1, –1); radius = $\sqrt{6}$
b. $(-1 + \sqrt{5}, 0)$, $(-1 - \sqrt{5}, 0)$, $(0, 1 + \sqrt{5})$, $(0, 1 - \sqrt{5})$

B) a. center = (–1, –1); radius = $\sqrt{6}$
b. $(-1 + \sqrt{7}, 0)$, $(-1 - \sqrt{7}, 0)$, $(0, 1 + \sqrt{5})$, $(0, 1 - \sqrt{5})$

C) a. center = (–1, 1); radius = $\sqrt{6}$
b. $(-1 + \sqrt{5}, 0)$, $(-1 - \sqrt{5}, 0)$, $(0, 1 + \sqrt{5})$, $(0, 1 - \sqrt{5})$

D) a. center = (–1, 1); radius = $\sqrt{6}$
b. $(-1 + \sqrt{5}, 0)$, $(0, 1 + \sqrt{5})$

90) $x^2 + y^2 - 2x + 2y - 6 = 0$ 90) _____

A) a. center = (1, –1); radius = $2\sqrt{2}$
b. $(-1 + \sqrt{7}, 0)$, $(-1 - \sqrt{7}, 0)$, $(0, 1 + \sqrt{7})$, $(0, 1 - \sqrt{7})$

B) a. center = (–1, 1); radius = 8
b. $(1 + \sqrt{7}, 0)$, $(0, -1 + \sqrt{7})$

C) a. center = (–1, –1); radius = $2\sqrt{2}$
b. $(1 + \sqrt{7}, 0)$, $(0, -1 + \sqrt{7})$

D) a. center = (1, –1); radius = $2\sqrt{2}$
b. $(1 + \sqrt{7}, 0)$, $(1 - \sqrt{7}, 0)$, $(0, -1 + \sqrt{7})$, $(0, -1 - \sqrt{7})$

91) $x^2 + y^2 - 4y - 12 = 0$ 91) _____

A) a. center = (0, 2); radius = 4
b. $(2\sqrt{3}, 0)$, (0, 6)

B) a. center = (2, 0); radius = 16
b. $(2\sqrt{3}, 0)$, $(-2\sqrt{3}, 0)$, (0, 6), (0, –2)

C) a. center = (0, 2); radius = 4
b. $(2\sqrt{3}, 0)$, $(-2\sqrt{3}, 0)$, (0, 6), (0, –2)

D) a. center = (0, –2); radius = 16
b. $(2\sqrt{3}, 0)$, (0, 6), (0, –2)

92) $3x^2 - 6x + 3y^2 - 9 = 0$ 92) _____

A) a. center = (–1, 0); radius = 4
b. (3, 0), (0, 3)

B) a. center = (1, 0); radius = 2
b. (3, 0), (–1, 0), (0, 3), (0, –3)

C) a. center = (–1, 0); radius = 2
b. (3, 0), (–1, 0), (0, 3), (0, –3)

D) a. center = (1, 0); radius = 4
b. (3, 0), (–1, 0), (0, 3), (0, –3)

93) $3x^2 + 3y^2 - 2y = 0$ 93) _____

A) a. center = $\left(0, \frac{1}{3}\right)$; radius = $\frac{1}{3}$
b. (0, 0), $\left(0, \frac{2}{3}\right)$

B) a. center = $\left(0, \frac{1}{3}\right)$; radius = $\frac{1}{3}$
b. (0, 0)

C) a. center = $\left(0, \frac{1}{3}\right)$; radius = $\frac{1}{9}$
b. $\left(0, \frac{2}{3}\right)$

D) a. center = $\left(0, -\frac{1}{3}\right)$; radius = $\frac{1}{3}$
b. (0, 0), $\left(0, \frac{2}{3}\right)$

94) $x^2 + y^2 + 6 = 0$ 94) _____

A) a. center = (0, 0); radius = 6
b. $(-\sqrt{6}, 0)$, $(\sqrt{6}, 0)$, $(0, \sqrt{6})$, $(0, -\sqrt{6})$

B) a. center = (0, 0); radius = $\sqrt{6}$
b. $(-\sqrt{6}, 0)$, $(\sqrt{6}, 0)$, $(0, \sqrt{6})$, $(0, -\sqrt{6})$

C) a. center = (0, 0); radius = $\sqrt{6}$
b. $(\sqrt{6}, 0)$, $(0, \sqrt{6})$

D) a. ∅
b. ∅

Solve for the requested variable.

95) The equation $E = 0.0055x^3 - 0.0037x^2 + 0.132x + 1.17$ gives the approximate total earnings of a company, in millions of dollars, where x = 0 corresponds to 1996. Determine the earnings for 1999. 95) _____

A) $1.75 million B) $1.68 million C) $1.99 million D) $1.46 million

96) Your company uses the quadratic model $y = -11x^2 + 350x$ to represent how many units (y) of a new product will be sold (x) weeks after its release. How many units can you expect to sell in week 15? 96) _____

A) 5085 units B) 2775 units C) 5415 units D) 7725 units

97) Your company uses the quadratic model $y = -4.5x^2 + 150x$ to represent the average number of new customers who will be signed on (x) weeks after the release of your new service. How many new customers can you expect to gain in week 6? 97) _____

A) 288 customers B) 369 customers C) 738 customers D) 873 customers

Find the slope of the line through the given pair of points.

98) (1, 2) and (8, 7) 98) _____

A) $\frac{7}{5}$ B) $-\frac{5}{7}$ C) $\frac{5}{7}$ D) 1

99) (4, –9) and (–1, –2) 99) _____

A) $-\frac{7}{5}$ B) $-\frac{11}{3}$ C) $-\frac{5}{7}$ D) $\frac{7}{5}$

100) (2, 6) and (–17, 16) 100) _____

A) $\frac{10}{19}$ B) $-\frac{19}{10}$ C) $-\frac{10}{19}$ D) $-\frac{22}{15}$

101) (–5, 9) and (–5, 2) 101) _____

A) $-\frac{11}{10}$ B) $-\frac{7}{10}$ C) 0 D) undefined

102) (8, –5), (4, –5) 102) _____

A) 0 B) –4 C) 4 D) undefined

103) $(\sqrt{3}, 2)$ and (0.46, 2) 103) _____

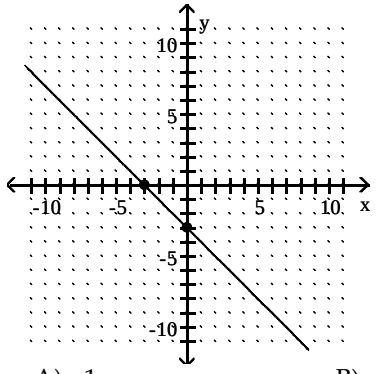
A) $0.46 - \sqrt{3}$ B) $\sqrt{3} - 0.46$ C) 0 D) undefined

104) (–14.7, –6.2), (–7.1, –3.3) 104) _____

A) $-\frac{76}{29}$ B) $\frac{29}{76}$ C) $\frac{76}{29}$ D) $-\frac{29}{76}$

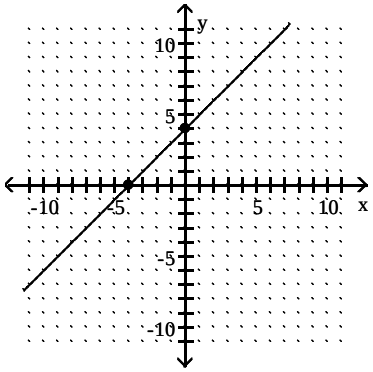
Find the slope of the line.

105) 105) _____



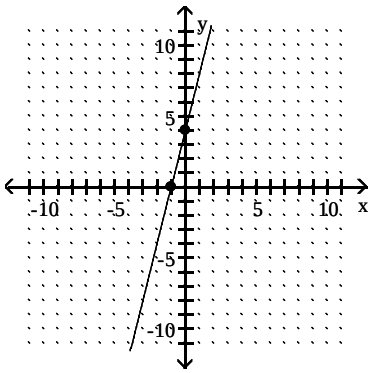
A) –1 B) –3 C) 1 D) 3

106) 106) _____



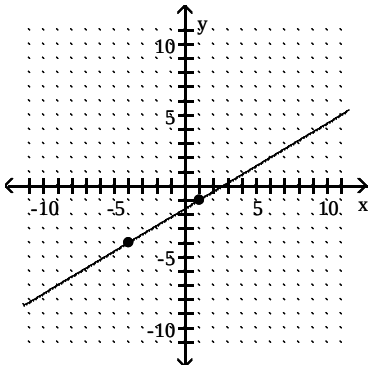
A) –1 B) –4 C) 4 D) 1

107) 107) _____

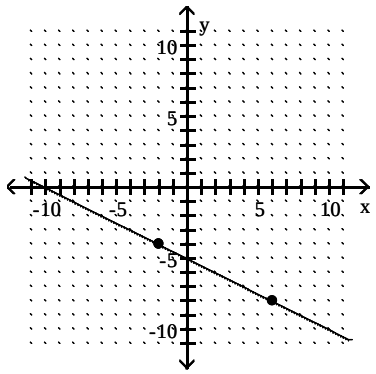


A) $\frac{1}{4}$ B) $-\frac{1}{4}$ C) 4 D) –4

108) 108) _____

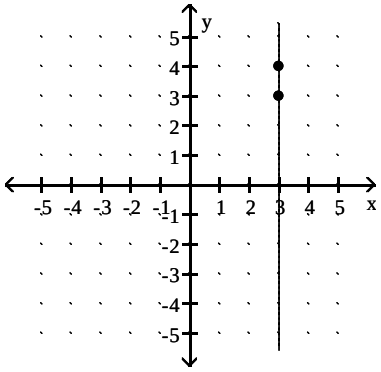


A) $\frac{5}{3}$ B) $\frac{3}{5}$ C) $-\frac{5}{3}$ D) $-\frac{3}{5}$

109) 

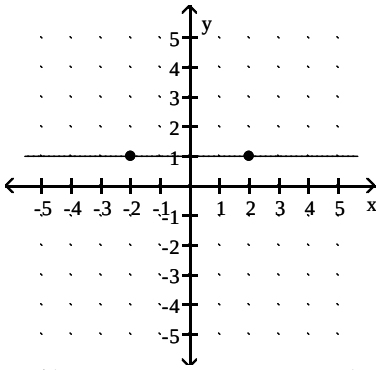
109) _____

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

110) 

110) _____

A) 0 B) 1 C) –1 D) undefined

111) 

111) _____

A) 4 B) –4 C) 0 D) undefined

Find an equation in slope–intercept form of the line that passes through the given point and has slope m.

112) (0, 7); $m = \frac{3}{2}$

112) _____

A) $y = 7x + \frac{3}{2}$ B) $y = 7x - \frac{3}{2}$ C) $y = \frac{3}{2}x - 7$ D) $y = \frac{3}{2}x + 7$

113) $(0, 3)$; $m = -\frac{3}{8}$ 113) _____

A) $y = 3x + \frac{3}{8}$ B) $y = 3x - \frac{3}{8}$ C) $y = -\frac{3}{8}x + 3$ D) $y = -\frac{3}{8}x - 3$

114) $(0, 5)$; $m = \frac{2}{3}$ 114) _____

A) $y = 5x - \frac{2}{3}$ B) $y = 5x + \frac{2}{3}$ C) $y = \frac{2}{3}x + 5$ D) $y = \frac{2}{3}x - 5$

115) $(5, 0)$; $m = 2$ 115) _____

A) $y = 2x - 10$ B) $y = 5x + 2$ C) $y = -2x + 5$ D) $y = -5x + 2$

116) $(3, 3)$; $m = -\frac{5}{9}$ 116) _____

A) $y = -\frac{9}{5}x + \frac{14}{3}$ B) $y = -\frac{5}{9}x + \frac{14}{3}$ C) $y = -\frac{5}{9}x + \frac{3}{14}$ D) $y = -\frac{5}{9}x - \frac{14}{3}$

117) $(3, 3)$; $m = -\frac{3}{7}$ 117) _____

A) $y = -\frac{3}{7}x + \frac{7}{30}$ B) $y = -\frac{3}{7}x + \frac{30}{7}$ C) $y = -\frac{7}{3}x - \frac{7}{30}$ D) $y = -\frac{3}{7}x - \frac{30}{7}$

118) $(12, -2)$; $m = -\frac{2}{5}$ 118) _____

A) $y = -\frac{2}{5}x + \frac{34}{5}$ B) $y = \frac{2}{5}x - \frac{14}{5}$ C) $y = -\frac{2}{5}x + \frac{22}{5}$ D) $y = -\frac{2}{5}x + \frac{14}{5}$

119) $(8, 7)$; $m = 0$ 119) _____

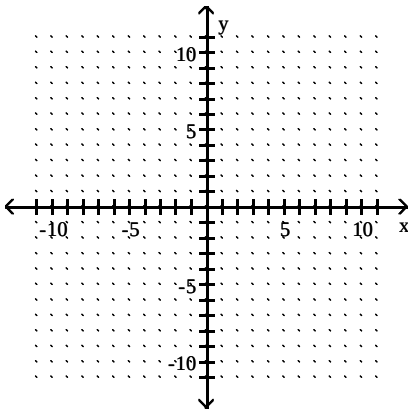
A) $y = 7$ B) $x = 8$ C) $y = -\frac{7}{8}x + 0$ D) $y = -\frac{8}{7}x + 0$

120) $(-1, 7)$; m is undefined 120) _____

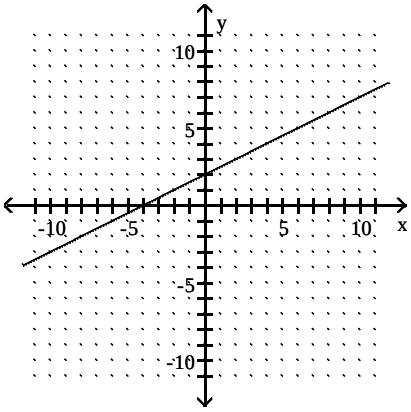
A) $x = 7$ B) $y = 7$ C) $x = -1$ D) $y = -1$

Sketch the graph of the line by locating the second point with the rise–and–run method.

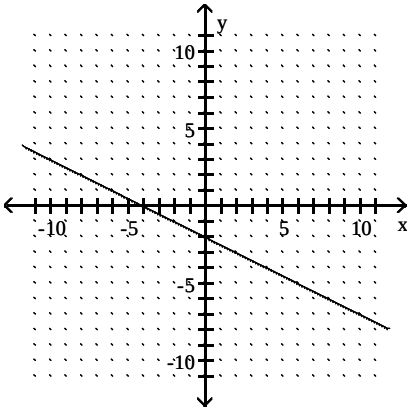
121) Through (0, 2), $m = \frac{1}{2}$ 121) _____



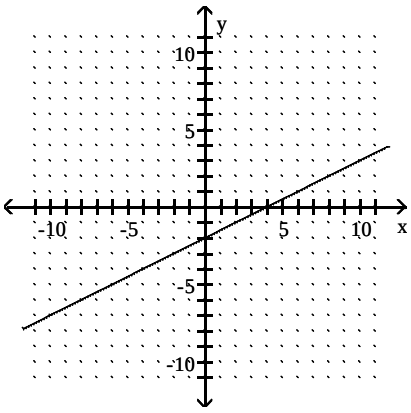
A)



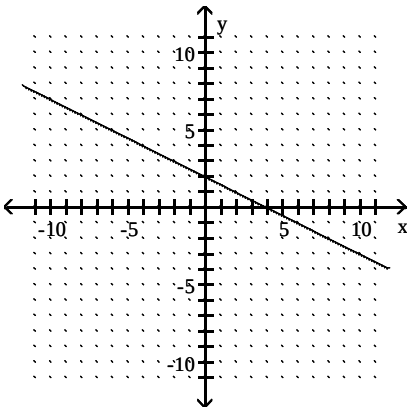
B)



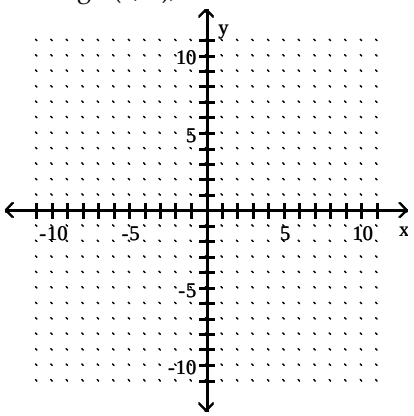
C)



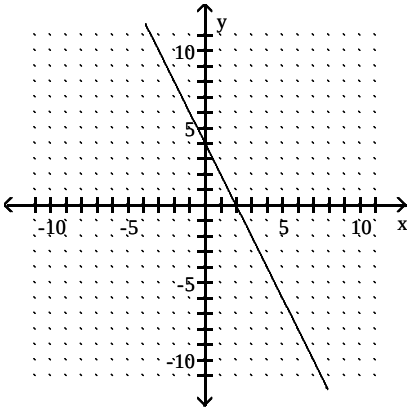
D)



122) Through (0, 4), m = –2 122) _____



A)



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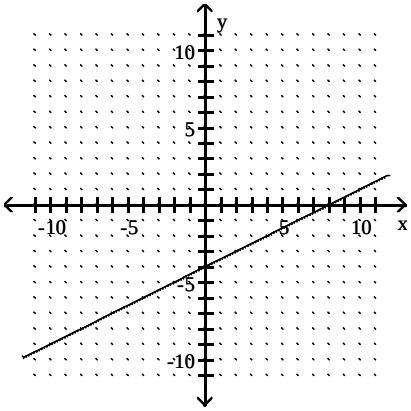
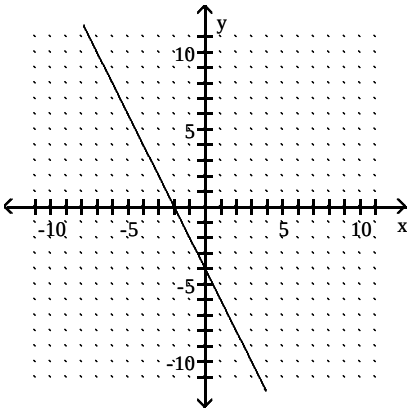
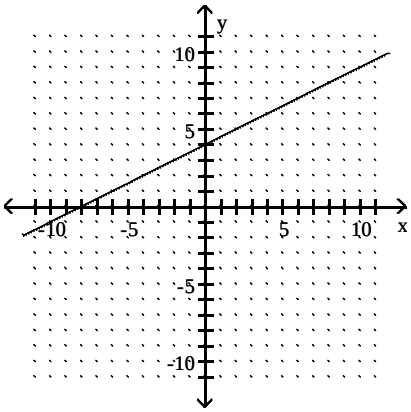


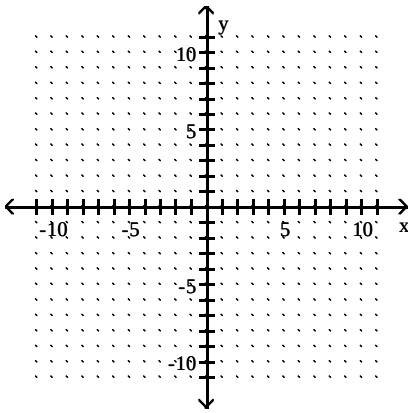
C)



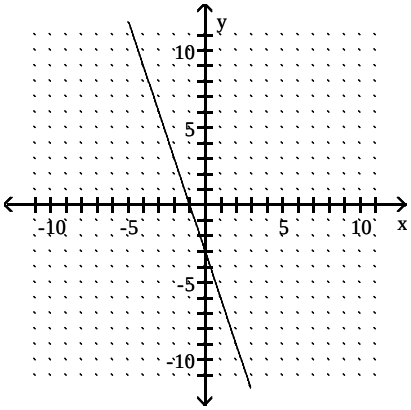
D)



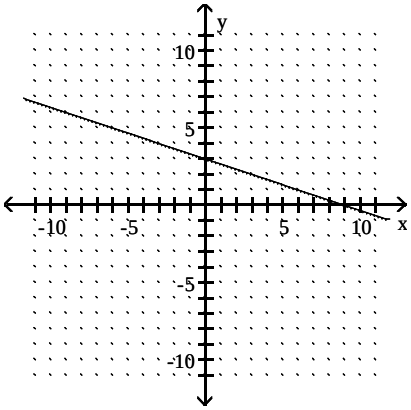
123) Through (9, 0), $m = -\frac{1}{3}$ 123) _____



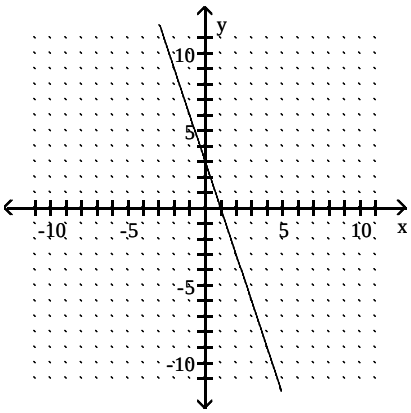
A)



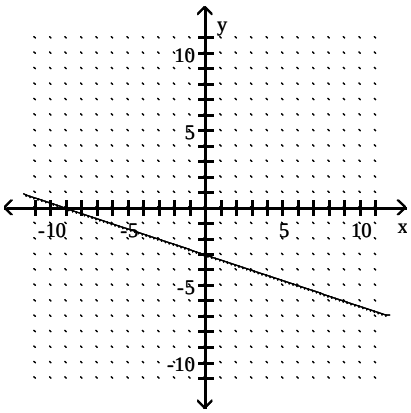
B)



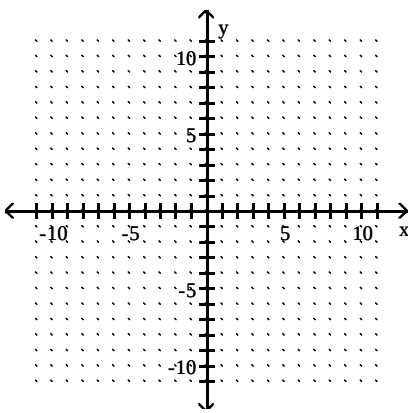
C)



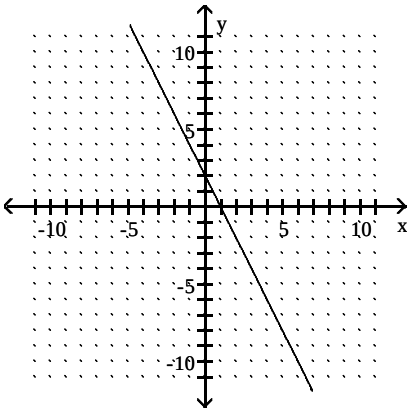
D)



124) Through (0, 2), $m = -\frac{1}{2}$ 124) _____



A)



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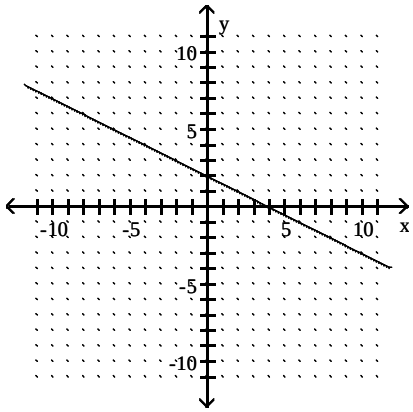

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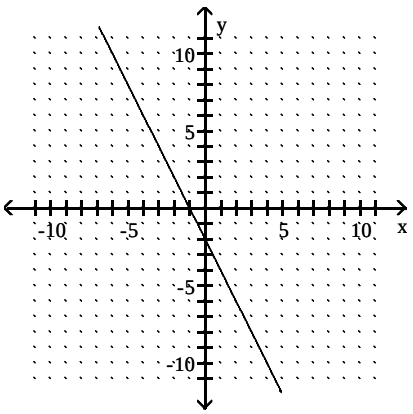

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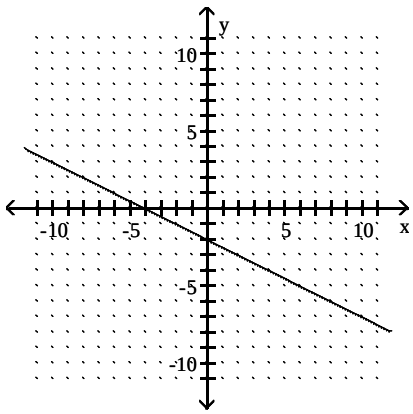
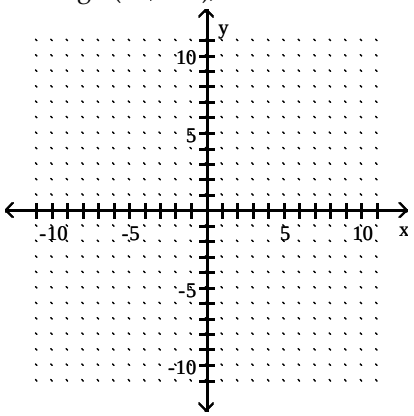
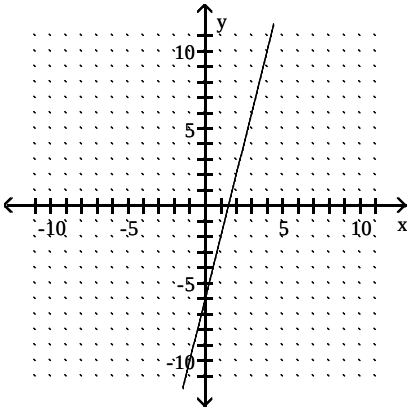


125) Through (–4, –10), m = 4 125) _____



A)



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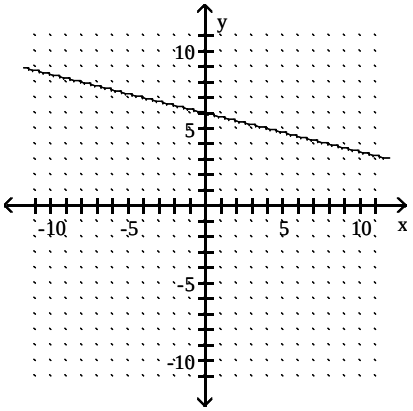
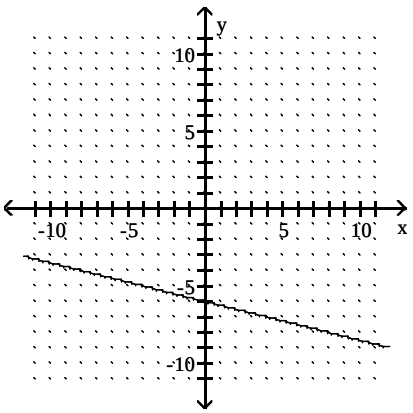
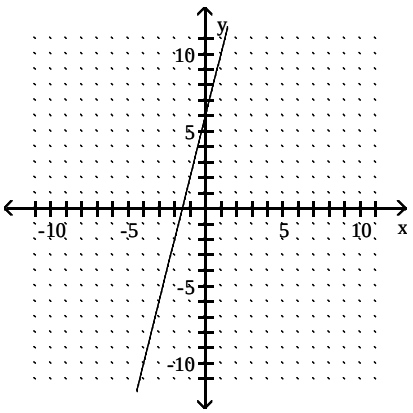


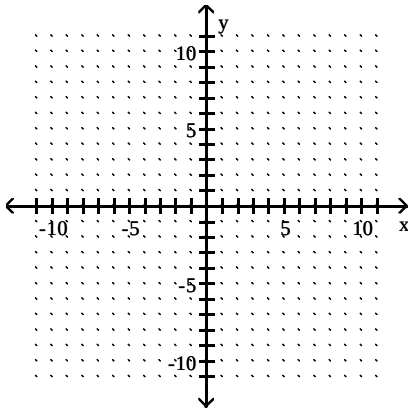
C)



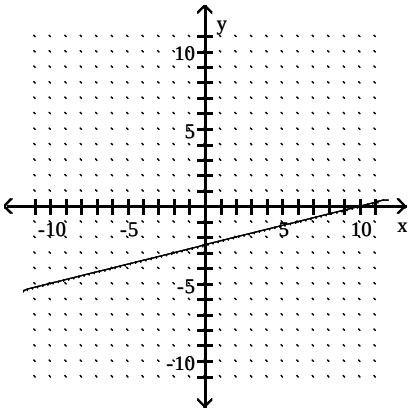
D)



126) Through (–2, –3), m = – 4 126) _____



A)



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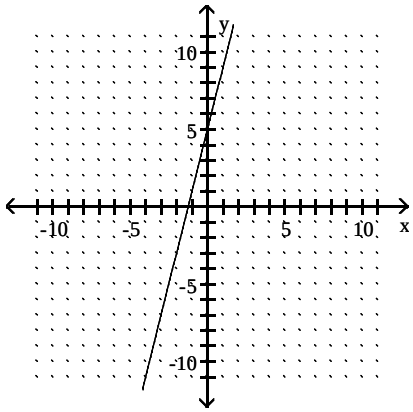

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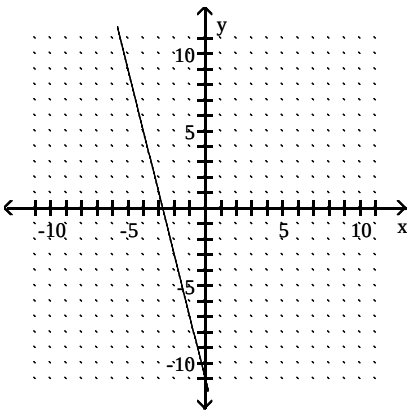
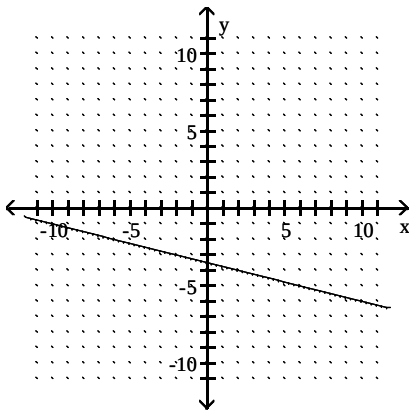
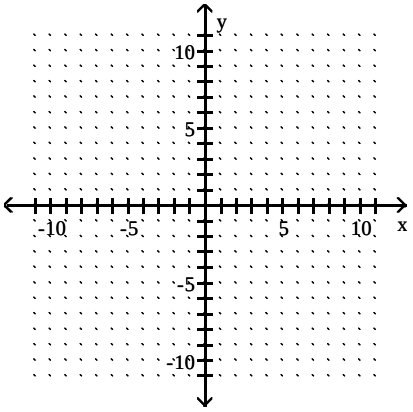


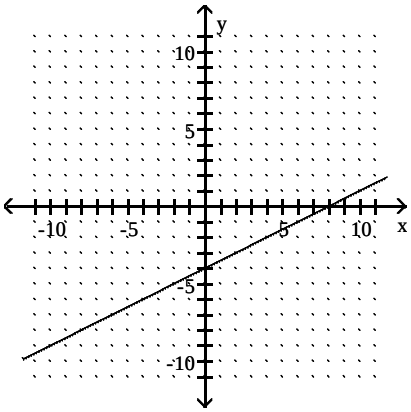
D)



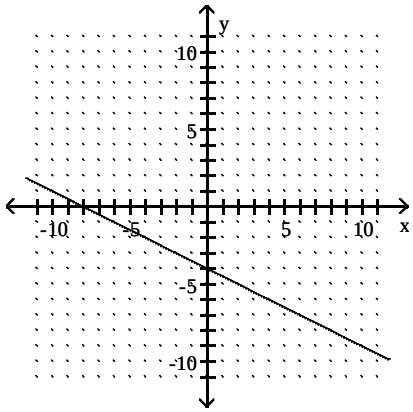
127) Through (–2, –3), $m = \frac{1}{2}$ 127) _____



A)



B)



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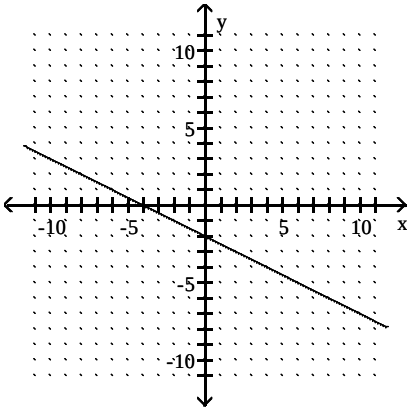
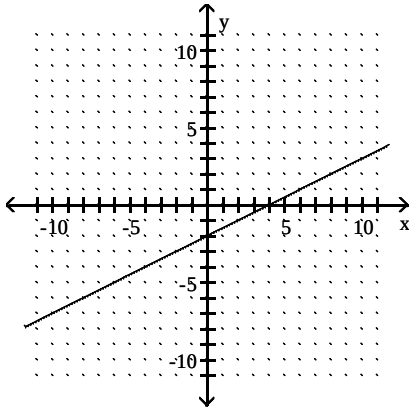
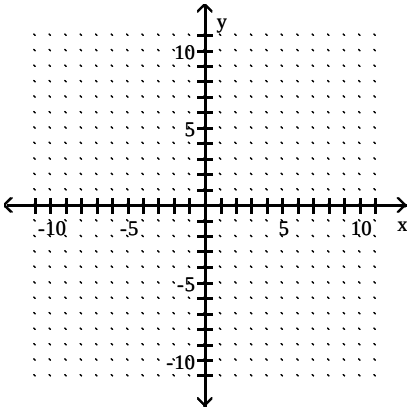


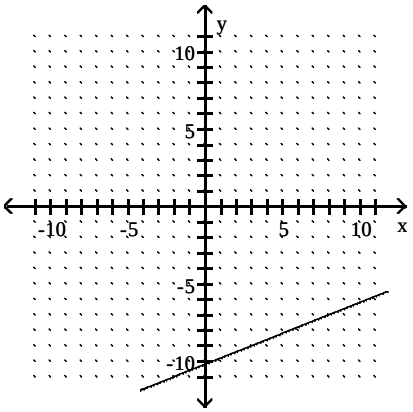
D)



128) Through $(-3, -9)$, $m = -\frac{2}{5}$ 128) _____



A)



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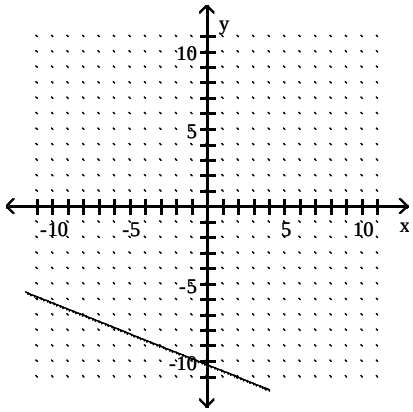

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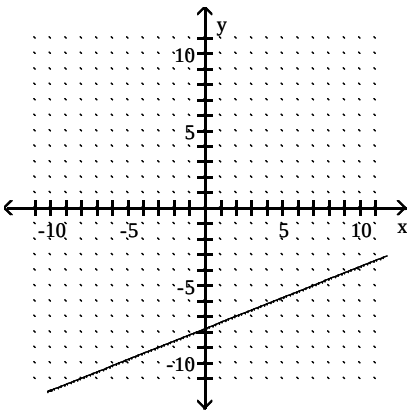

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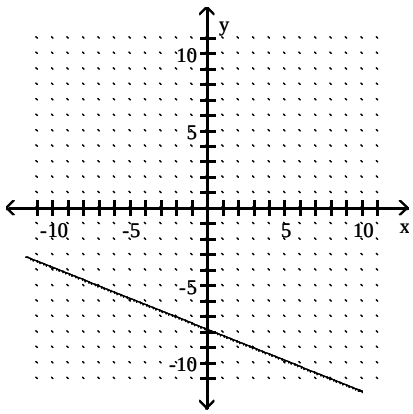
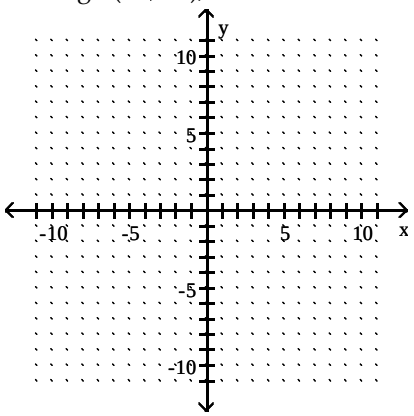
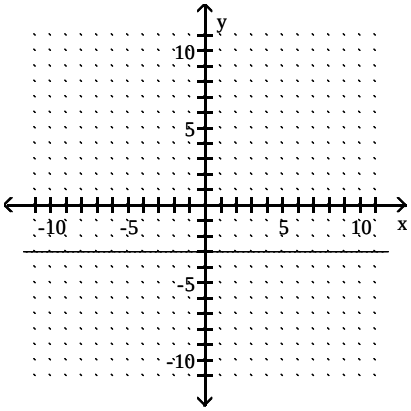


129) Through (–3, –2), m = 0 129) _____



A)



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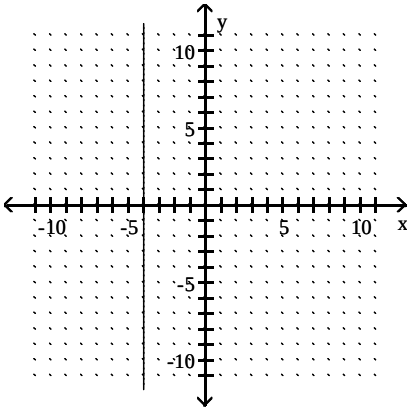

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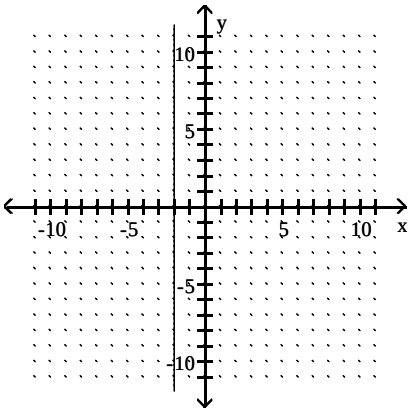

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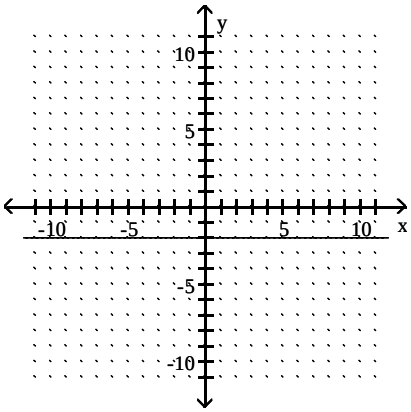
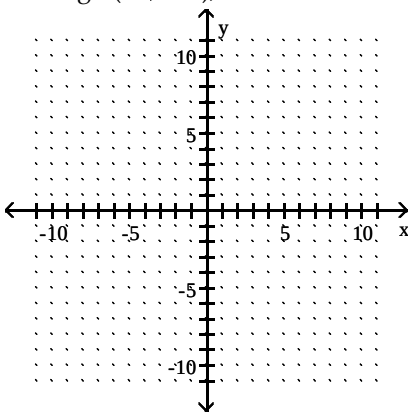
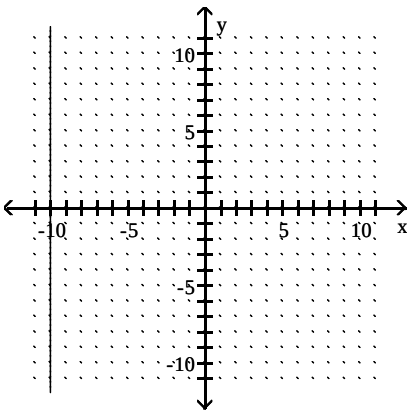


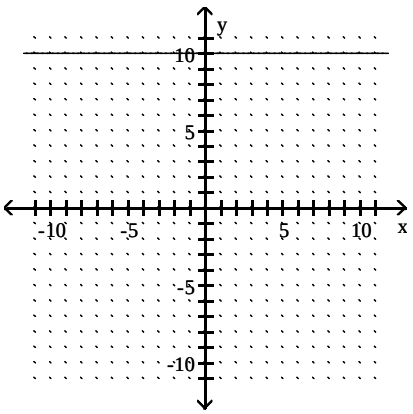
130) Through (–3, –10), m is undefined. 130) _____



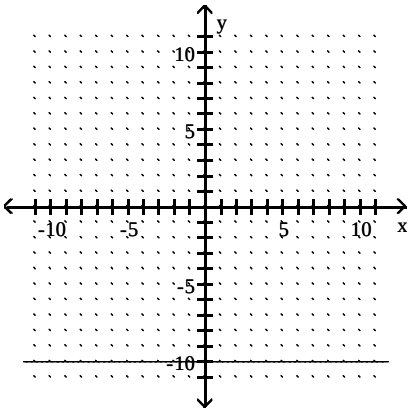
A)



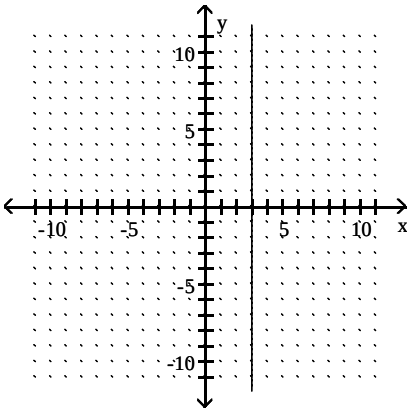
B)



C)



D)



Find an equation in slope–intercept form for the nonvertical lines. Write the vertical lines in the form x = h.

131) Passing through (6, 9) and (0, –4) 131) _____

A) $y = -\frac{3}{4}x - 4$ B) $y = \frac{3}{4}x - 4$ C) $y = -\frac{13}{6}x - 4$ D) $y = \frac{13}{6}x - 4$

132) Passing through (8, 0) and (3, –3) 132) _____

A) $y = \frac{4}{3}x - 7$ B) $y = \frac{3}{5}x - \frac{24}{5}$ C) $y = -\frac{4}{3}x - 7$ D) $y = -\frac{3}{5}x - \frac{24}{5}$

133) Passing through (–2, 7) and (0, –8) 133) _____

A) $y = \frac{9}{8}x - 8$ B) $y = -\frac{15}{2}x - 8$ C) $y = \frac{15}{2}x - 8$ D) $y = -\frac{9}{8}x - 8$

134) Passing through (4, 8) and (–1, –6) 134) _____

A) $y = \frac{4}{5}x - \frac{34}{5}$ B) $y = -\frac{4}{5}x - \frac{34}{5}$ C) $y = \frac{14}{5}x - \frac{16}{5}$ D) $y = -\frac{14}{5}x - \frac{16}{5}$

135) Passing through (–6, –8) and (4, –8) 135) _____

A) $y = -8$ B) $y = 2x + 10$ C) $y = -6x - 38$ D) $y = 3x + 16$

136) Passing through (–3, –2) and (–3, –9) 136) _____

A) $y = -3$ B) $x = -2$ C) $y = -2$ D) $x = -3$

Use the given conditions to find an equation in slope–intercept form of each of the nonvertical lines. Write vertical lines in the form x = h.

137) A vertical line through (–4.37, –6.03) 137) _____

A) $x = -6.03$ B) $y = -4.37$ C) $x = -4.37$ D) $y = -6.03$

138) A horizontal line through (6.11, 4.34) 138) _____

A) $x = 4.34$ B) $x = 6.11$ C) $y = 6.11$ D) $y = 4.34$

139) $m = \frac{7}{2}$; y–intercept = –5 139) _____

A) $y = \frac{7}{2}x + 5$ B) $y = \frac{7}{2}x - 5$ C) $y = -\frac{7}{2}x - 5$ D) $y = -\frac{7}{2}x + 5$

140) $m = -\frac{2}{3}$; y–intercept = 3 140) _____

A) $y = -\frac{2}{3}x + 3$ B) $y = \frac{2}{3}x + 3$ C) $y = -\frac{2}{3}x - 3$ D) $y = \frac{2}{3}x - 3$

141) y–intercept –15; x–intercept 13 141) _____

A) $y = -\frac{15}{13}x - 15$ B) $y = \frac{15}{13}x + 15$ C) $y = \frac{13}{15}x - 15$ D) $y = \frac{15}{13}x - 15$

142) Perpendicular to x = 1; passing through (–1, –5) 142) _____

A) $-5x - 1y = 0$ B) $x = -1$ C) $y = -5$ D) $-1x - 5y = 0$

143) Parallel to x = –5; passing through (9, 6) 143) _____

A) $y = -5$ B) $x = 6$ C) $x = 9$ D) $y = 6$

144) Parallel to y = 0; passing through (7, 10) 144) _____

A) $y = 10$ B) $y = -7$ C) $x = -10$ D) $x = 7$

145) Parallel to $-7x + 2y = -33$; passing through (7, 11) 145) _____

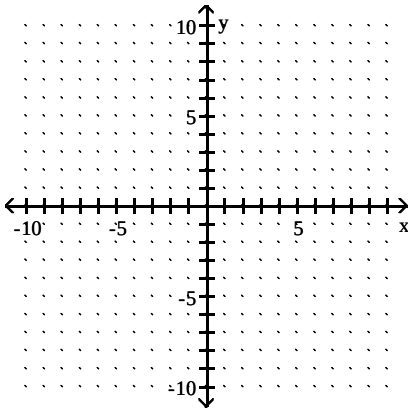
A) $y = \frac{2}{7}x - \frac{11}{7}$ B) $y = -\frac{7}{2}x + \frac{27}{2}$ C) $y = \frac{7}{2}x - \frac{27}{2}$ D) $y = -\frac{7}{2}x - \frac{33}{2}$

146) Perpendicular to $7x + 3y = 4$; passing through $(4, -8)$ 146) _____

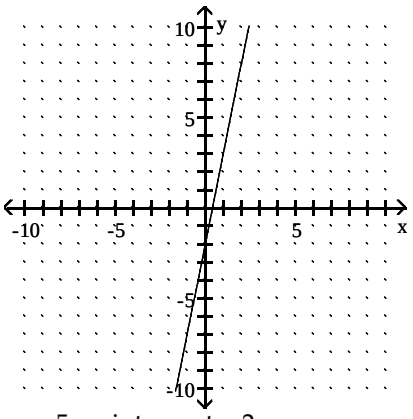
A) $y = \frac{7}{3}x + 68$ B) $y = \frac{3}{7}x$ C) $y = \frac{3}{7}x - \frac{68}{7}$ D) $y = -\frac{3}{7}x + \frac{68}{7}$

Find the slope and the y–intercept from the equation of the line. Sketch a graph of the equation.

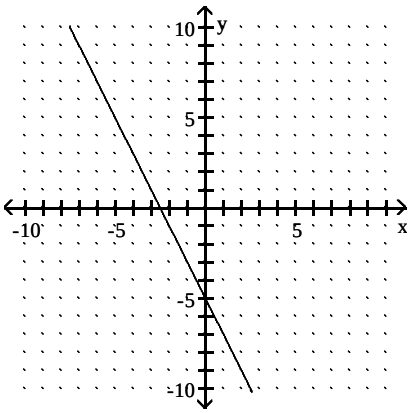
147) $y = 2x - 5$ 147) _____



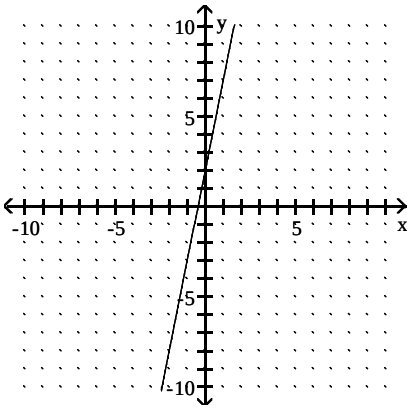
A) m = 2, y–intercept = 5



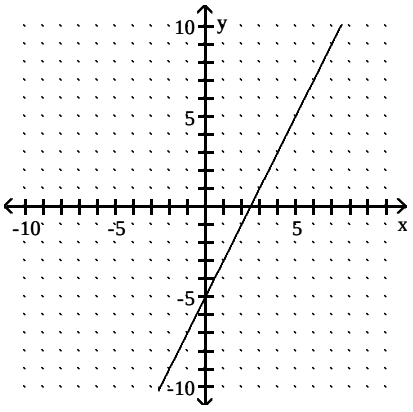
B) m = 5, y–intercept = 2



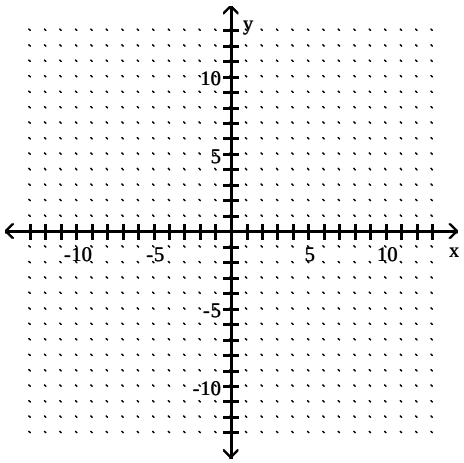
C) m = 5, y–intercept = 2



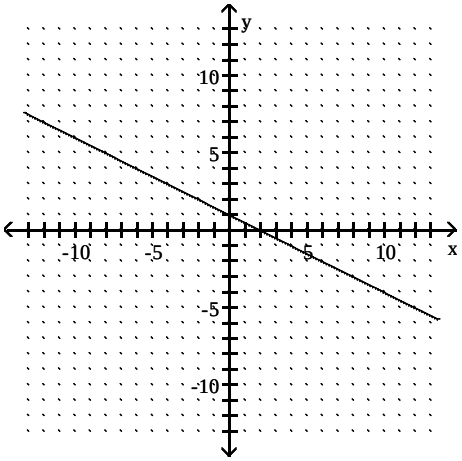
D) m = 2, y–intercept = – 5



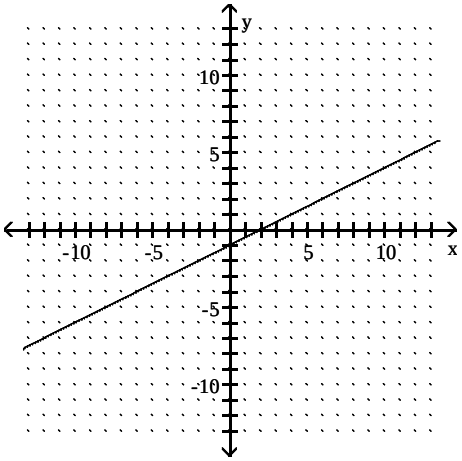
148) $y = -\frac{1}{2}x + 1$ 148) _____



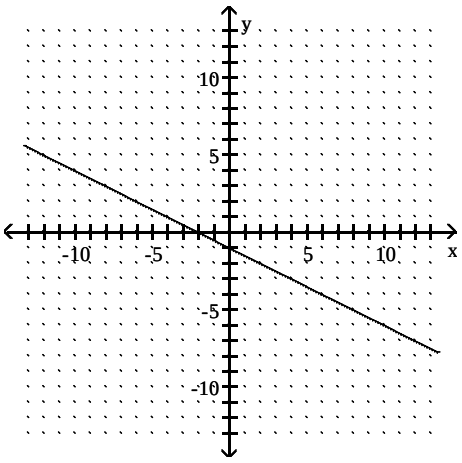
A) $m = -\frac{1}{2}$; y–intercept = 1



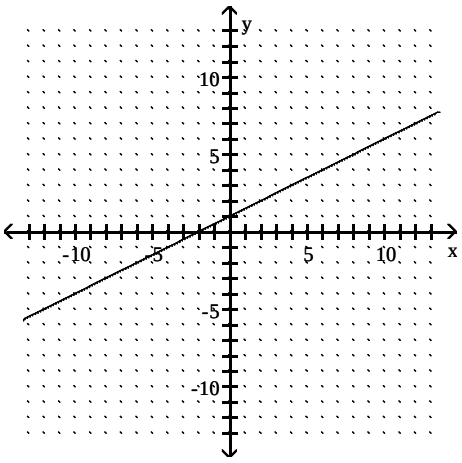
B) $m = \frac{1}{2}$; y–intercept = –1



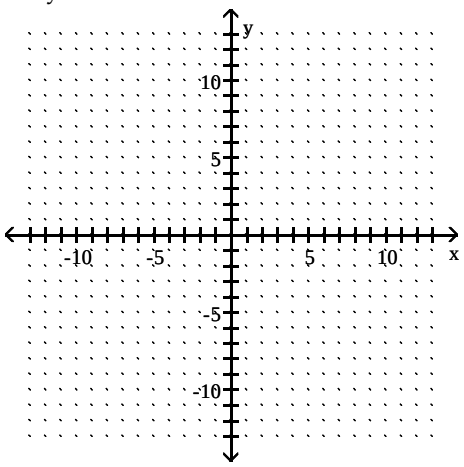
C) $m = -\frac{1}{2}$; y–intercept = –1



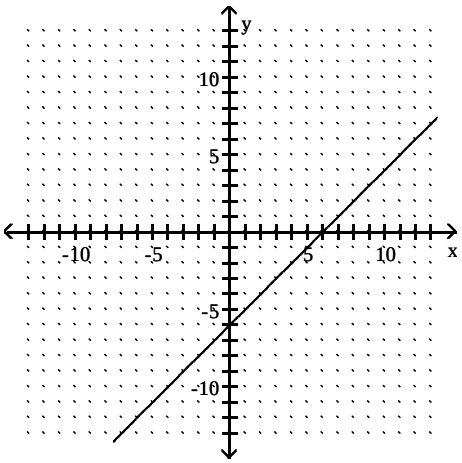
D) $m = \frac{1}{2}$; y–intercept = 1



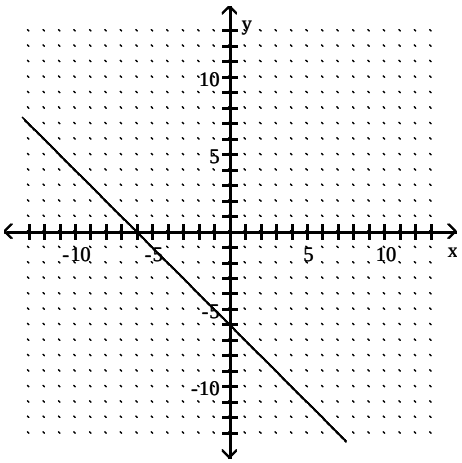
149) $x + y = -6$ 149) _____



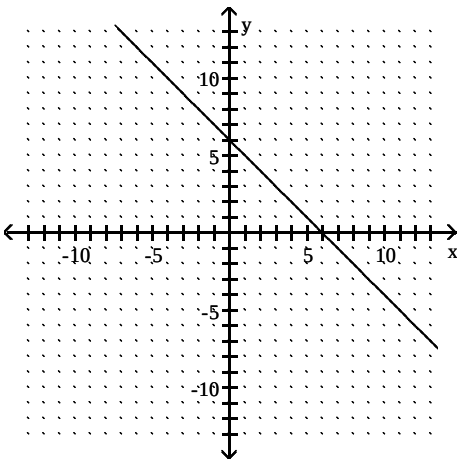
A) m = 1; y–intercept = –6



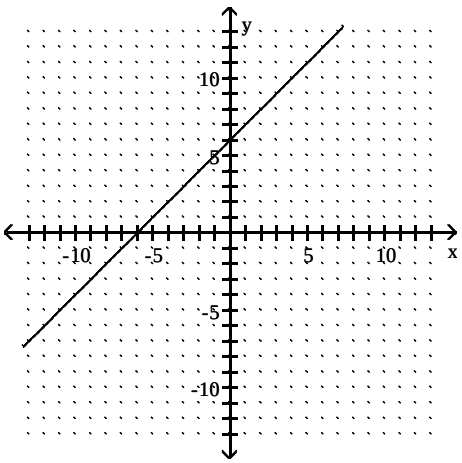
B) m = –1; y–intercept = –6



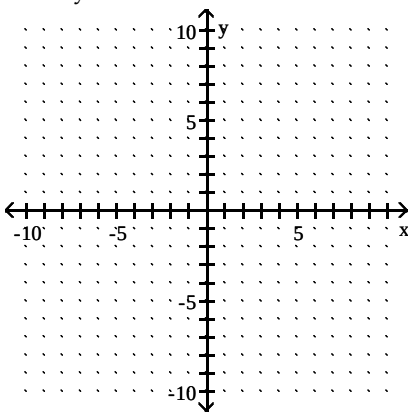
C) m = –1; y–intercept = 6



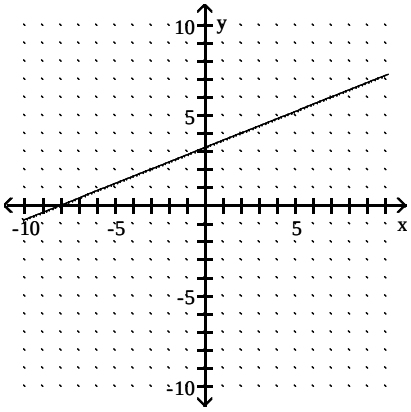
D) m = 1; y–intercept = 6



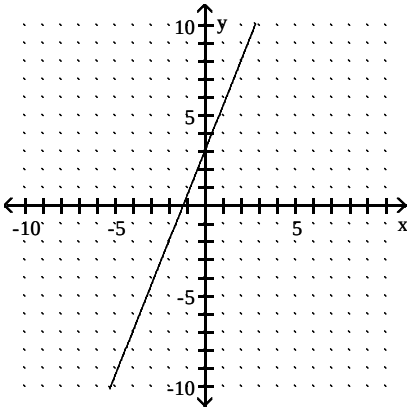
150) $2x + 5y = 26$ 150) _____



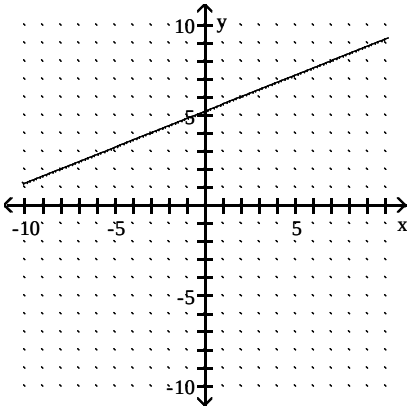
A) $m = \frac{2}{5}$; y-intercept $= \frac{16}{5}$



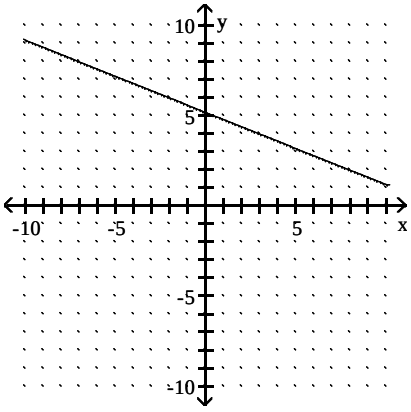
B) $m = \frac{5}{2}$; y-intercept $= \frac{16}{5}$



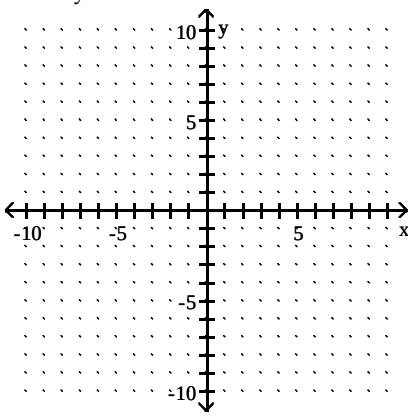
C) $m = \frac{2}{5}$; y-intercept $= \frac{26}{5}$



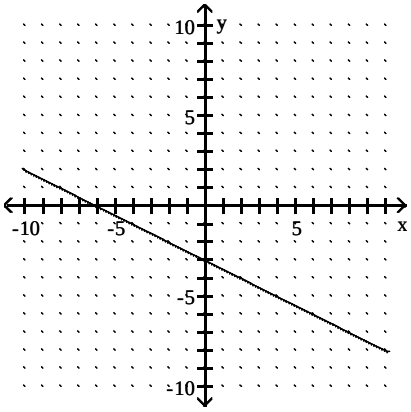
D) $m = -\frac{2}{5}$; y-intercept $= \frac{26}{5}$



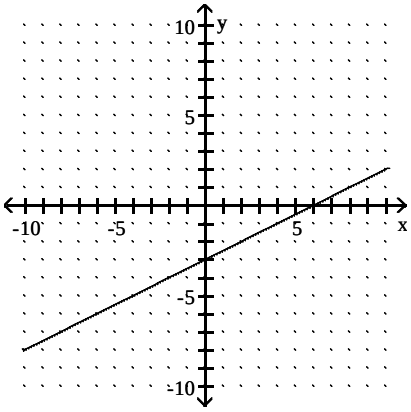
151) $2x - 4y = 12$ 151) _____



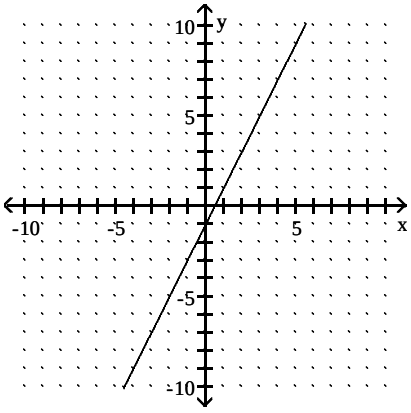
A) $m = -\frac{1}{2}$; y-intercept $= -3$



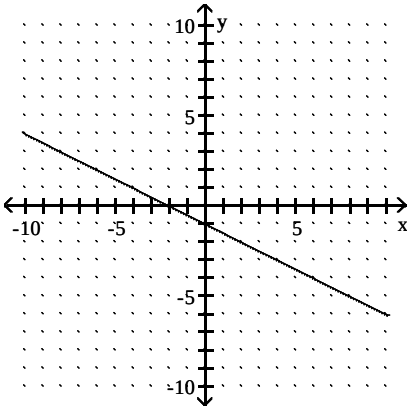
B) $m = \frac{1}{2}$; y-intercept $= -3$



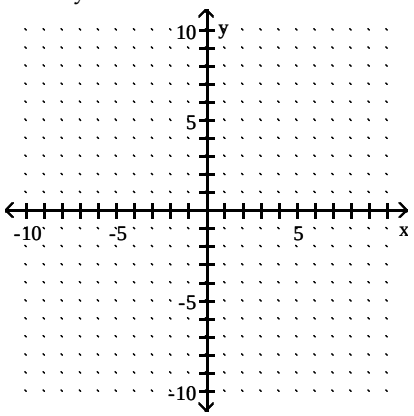
C) $m = 2$; y-intercept $= -1$



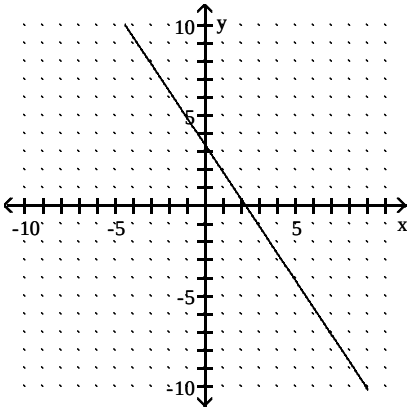
D) $m = -\frac{1}{2}$; y-intercept $= -1$



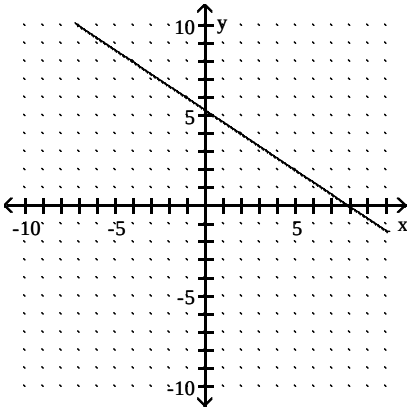
152) $2x - 3y = -16$ 152) _____



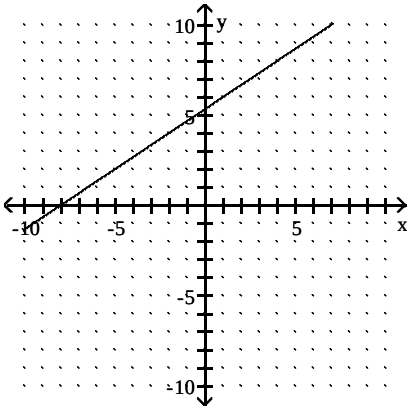
A) $m = -\frac{3}{2}$; y-intercept $= \frac{10}{3}$



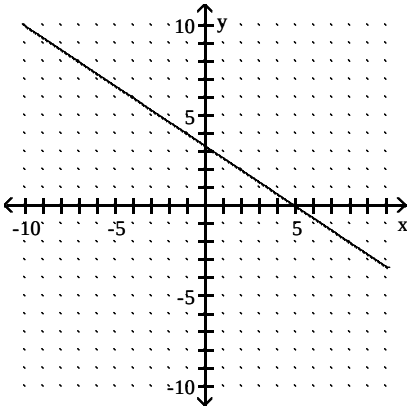
B) $m = -\frac{2}{3}$; y-intercept $= \frac{16}{3}$



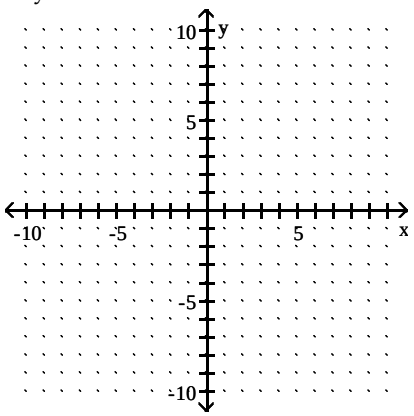
C) $m = \frac{2}{3}$; y-intercept $= \frac{16}{3}$



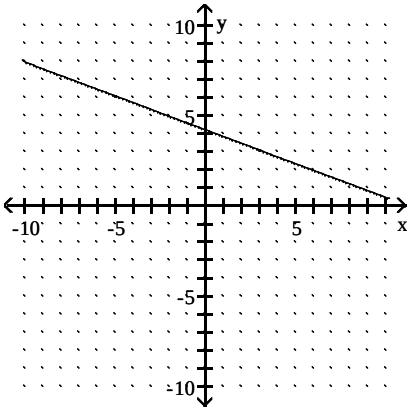
D) $m = -\frac{2}{3}$; y-intercept $= \frac{10}{3}$



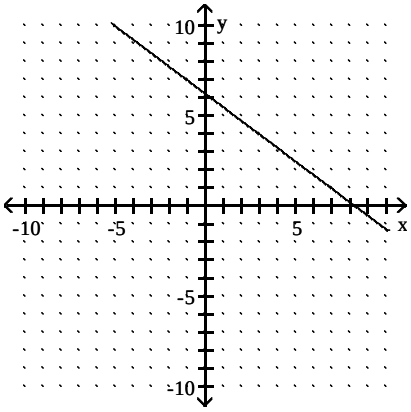
153) $-4y = -3x - 25$ 153) _____



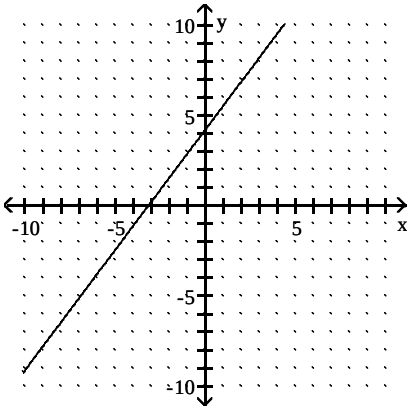
A) $m = -\frac{3}{4}$; y-intercept $= \frac{17}{4}$



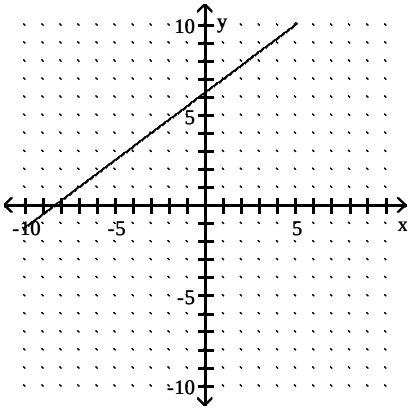
B) $m = -\frac{3}{4}$; y-intercept $= \frac{25}{4}$



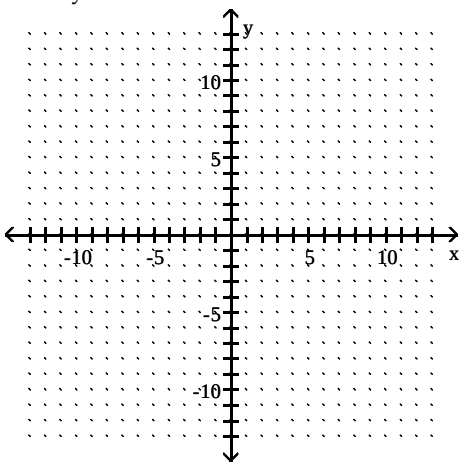
C) $m = \frac{4}{3}$; y-intercept $= \frac{17}{4}$



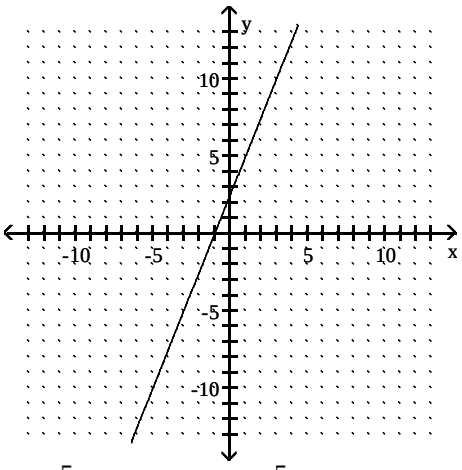
D) $m = \frac{3}{4}$; y-intercept $= \frac{25}{4}$



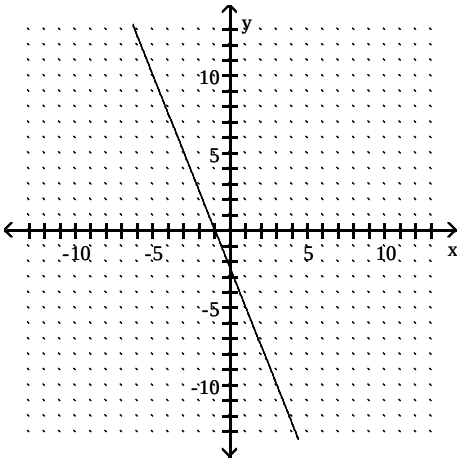
154) $5x - 2y + 5 = 0$ 154) _____



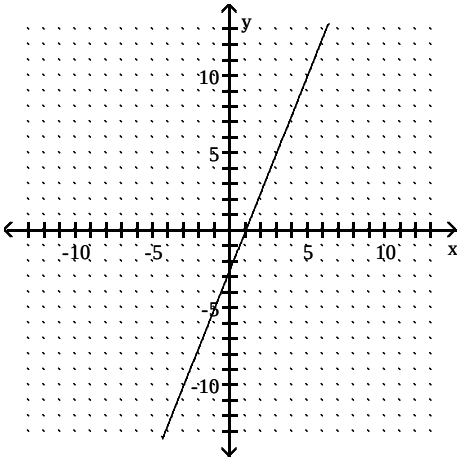
A) $m = \frac{5}{2}$; y-intercept $= \frac{5}{2}$



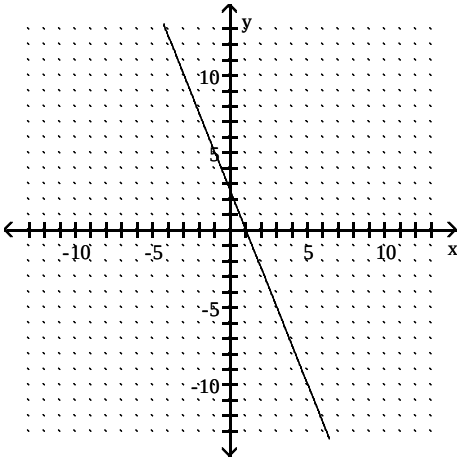
B) $m = -\frac{5}{2}$; y-intercept $= -\frac{5}{2}$



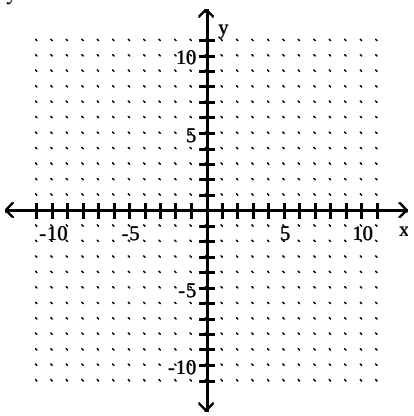
C) $m = \frac{5}{2}$; y-intercept $= -\frac{5}{2}$



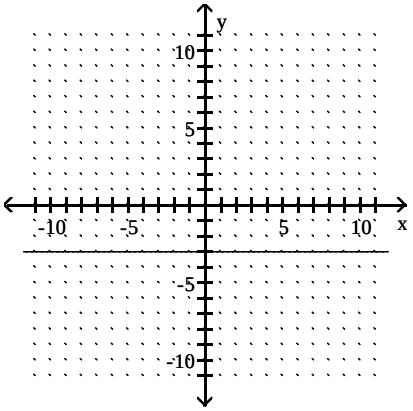
D) $m = -\frac{5}{2}$; y-intercept $= \frac{5}{2}$



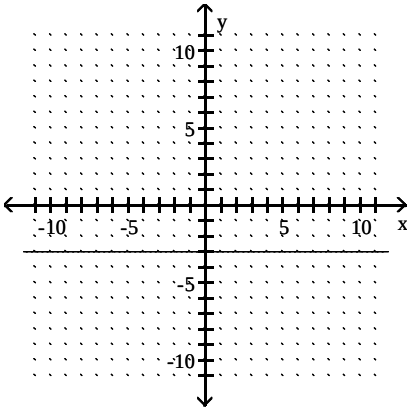
155) y = –3 155) _____



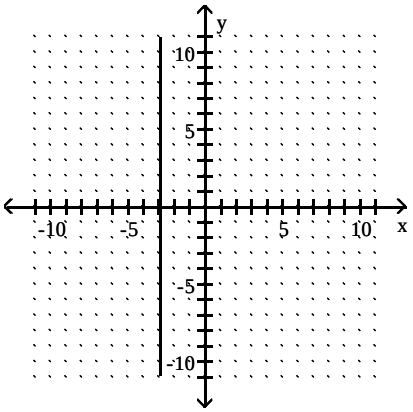
A) m = 0; y–intercept = –3



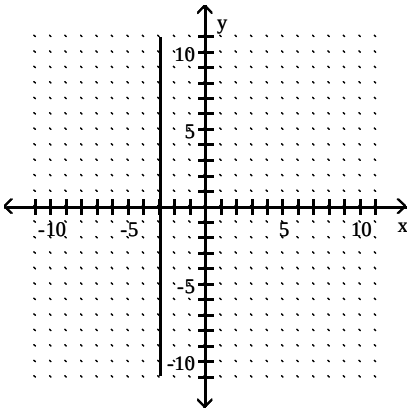
B) m = undefined; y–intercept = –3



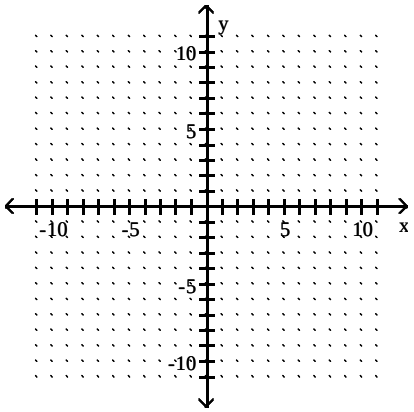
C) m = undefined; y–intercept = none



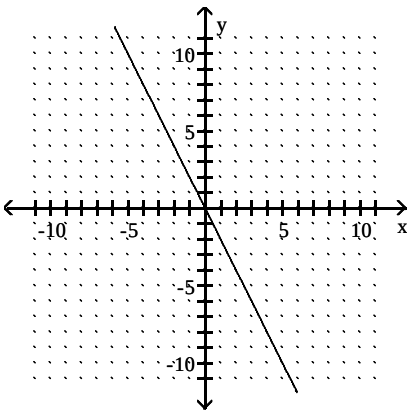
D) m = 0; y–intercept = none



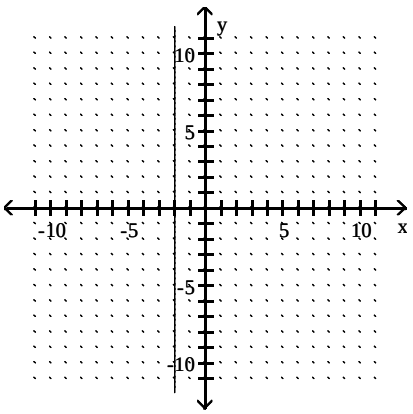
156) $x = -2$ 156) _____



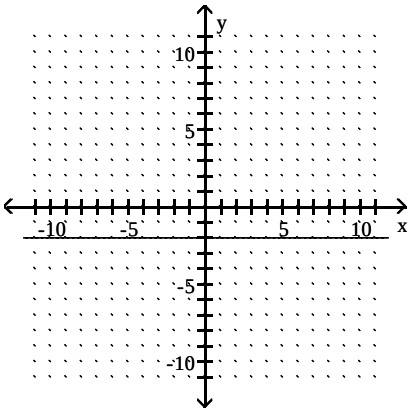
A) m = –2; y–intercept = 0



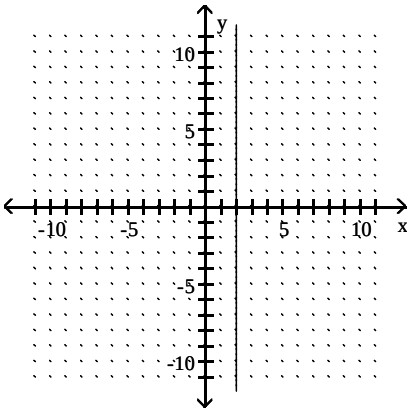
B) m = undefined; y–intercept = none



C) m = 0; y–intercept = –2



D) m = undefined; y–intercept = none



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

157) $3x - 2y = -15$
$2x + 3y = -15$ 157) _____

A) Parallel B) Perpendicular C) Neither

158) $3x - 2y = 5$
$2x + 3y = 5$ 158) _____

A) Parallel B) Perpendicular C) Neither

159) $6x + 2y = 8$
$12x + 4y = 18$ 159) _____

A) Parallel B) Perpendicular C) Neither

160) $9x + 3y = 12$
$27x + 9y = 39$ 160) _____
A) Parallel B) Perpendicular C) Neither

161) $4x - 12y = 14$
$64x + 16y = 14$ 161) _____
A) Parallel B) Perpendicular C) Neither

162) $y + 14 = -4x$
$2y = 10x - 1$ 162) _____
A) Parallel B) Perpendicular C) Neither

163) $y - 1 = -x$
$y - x = 1$ 163) _____
A) Parallel B) Perpendicular C) Neither

164) $y = 9 - 1.5x$
$y = -\frac{3}{2}x - 9$ 164) _____
A) Parallel B) Perpendicular C) Neither

165) $y = -\frac{17}{3}x + 2$ 165) _____
$y = \frac{3}{17}x + 2$
A) Parallel B) Perpendicular C) Neither

Solve the problem.

166) To convert a temperature from degrees Celsius to degrees Fahrenheit, you multiply the temperature in degrees Celsius by 1.8 and then add 32 to the result. Find a linear equation to convert from degrees Celsius to degrees Fahrenheit. 166) _____
A) $F = 1.8c + 32$ B) $F = 1.8 + 32c$ C) $F = \frac{c - 32}{1.8}$ D) $F = 33.8c$

167) If an object is dropped off of a tower, the velocity, V, of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Find an equation relating the velocity, V, to the number of seconds, t. 167) _____
A) $V = 42t$ B) $V = 32t + 10$ C) $V = 32 + 10t$ D) $V = \frac{t-10}{32}$

168) The cost for labor associated with fixing a washing machine is computed as follows: There is a fixed charge of $35 for the repairman to come to the house, to which a charge of $24 per hour is added. Find an equation that can be used to determine the labor cost, C, of a repair that takes x hours. 168) _____
A) $C = 35 + 24x$ B) $C = (35 + 24)x$ C) $C = 24 + 35x$ D) $C = 35 - 24x$

169) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.05 as soon as you get in the taxi, to which a charge of $1.90 per mile is added. Find an equation that can be used to determine the cost, C, of an x–mile taxi ride. 169) _____
A) $C = 3.95x$ B) $C = 2.05 + 1.90x$ C) $C = 2.45x$ D) $C = 1.90 + 2.05x$

170) Marty's Tee Shirt & Jacket Company is to produce a new line of jackets with an embroidery of a Great Pyrenees dog on the front. There are fixed costs of $670 to set up for production, and variable costs of $44 per jacket. Write an equation that can be used to determine the total cost, C, encountered by Marty's Company in producing x jackets. 170) _____

A) C = 670 – 44x B) C = (670 + 44) x C) C = 670 + 44x D) C = 670x + 44

171) The average value of a certain type of automobile was $15,120 in 1995 and depreciated to $6600 in 2000. Let y be the average value of the automobile in the year x, where x = 0 represents 1995. Write a linear equation that models the value of the automobile in terms of the year x. 171) _____

A) y = –1704x + 6600 B) $y = -\frac{1}{1704}x - 6600$

C) y = –1704x – 1920 D) y = –1704x + 15,120

172) An investment is worth $2098 in 1993. By 1996 it has grown to $3877. Let y be the value of the investment in the year x, where x = 0 represents 1993. Write a linear equation that models the value of the investment in the year x. 172) _____

A) y = –593x + 2098 B) $y = \frac{1}{593}x + 2098$

C) y = –593x + 5656 D) y = 593x + 2098

173) A faucet is used to add water to a large bottle that already contained some water. After it has been filling for 5 seconds, the gauge on the bottle indicates that it contains 25 ounces of water. After it has been filling for 13 seconds, the gauge indicates the bottle contains 57 ounces of water. Let y be the amount of water in the bottle x seconds after the faucet was turned on. Write a linear equation that models the amount of water in the bottle in terms of x. 173) _____

A) y = 4x + 44 B) y = 4x + 5 C) y = –4x + 45 D) $y = \frac{1}{4}x + \frac{95}{4}$

174) When making a telephone call using a calling card, a call lasting 6 minutes cost $2.00. A call lasting 13 minutes cost $3.75. Let y be the cost of making a call lasting x minutes using a calling card. Write a linear equation that models the cost of a making a call lasting x minutes. 174) _____

A) y = 0.25x + 0.5 B) y = 4x – 22 C) y = 0.25x – 9.25 D) y = –0.25x + 3.5

175) A vendor has learned that, by pricing pretzels at $1.00, sales will reach 159 pretzels per day. Raising the price to $2.00 will cause the sales to fall to 119 pretzels per day. Let y be the number of pretzels the vendor sells at x dollars each. Write a linear equation that models the number of pretzels sold per day when the price is x dollars each. 175) _____

A) y = –40x + 199 B) y = –40x – 199

C) $y = -\frac{1}{40}x + \frac{6359}{40}$ D) y = 40x + 119

176) The cost of manufacturing a molded part is related to the quantity produced during a production run. When 100 parts are produced, the cost is $300. When 500 parts are produced, the cost is $4300. What is the average cost per part? 176) _____

A) $11.00 per part B) $0.10 per part C) $8.00 per part D) $10.00 per part

177) A cross–country skier reaches the 11–km mark of a race 40 min after reaching the 4–km mark. Find the speed of the skier. 177) _____

A) $\frac{33}{2}$ km/hr B) 7 km/hr C) $\frac{21}{2}$ km/hr D) 21 km/hr

178) To convert a temperature from degrees Celsius to degrees Fahrenheit, you multiply the temperature in degrees Celsius by 1.8 and then add 32 to the result. Find a linear equation to convert from degrees Celsius to degrees Fahrenheit. Use this function to convert 20° C to °F. 178) _____

A) 55.7°F B) 63.3°F C) 59°F D) 68°F

179) If an object is dropped from a tower, then the velocity, V (in feet per second), of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Find an equation relating the velocity, V, to the number of seconds, t. Use this equation to find the velocity of the object at time t = 2.6 seconds. 179) _____

A) 91.2 ft/sec B) 94.5 ft/sec C) 92.5 ft/sec D) 93.2 ft/sec

180) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.50 as soon as you get in the taxi, to which a charge of $2.30 per mile is added. Find an equation that can be used to determine the cost, C, of an x–mile taxi ride, and use this equation to find the cost of a 3–mile taxi ride. 180) _____

A) $9.40 B) $10.30 C) $9.58 D) $9.28

181) Marty's Tee Shirt & Jacket Company is to produce a new line of jackets with a embroidery of a Great Pyrenees dog on the front. There are fixed costs of $620 to set up for production, and variable costs of $28 per jacket. Write an equation that can be used to determine the total cost, C, encountered by Marty's Company in producing x jackets, and use the equation to find the total cost of producing 104 jackets. 181) _____

A) $3512 B) $3524 C) $3532 D) $3544

182) The cost of owning a home includes both fixed costs and variable utility costs. Assume that it costs $4751 per month for mortgage and insurance payments and it costs an average of $4.13 per unit for natural gas, electricity, and water usage. (i) Determine a linear function that computes the annual cost of owning this home if x utility units are used. (ii) What does the y–intercept on the graph of the function represent? 182) _____

A) y = 4.13x + 4751; y–intercept, 4751, represents the minimum cost of owning the home without spending anything on utilities.

B) y = 4.13x + 57,012; y–intercept, 57,012, represents the minimum cost of owning the home for 12 months without spending anything on utilities.

C) y = –4.13x + 4751; y–intercept, 4751, represents the minimum cost of owning the home without spending anything on utilities.

D) y = –4.13x + 57,012; y–intercept, 57,012, represents the minimum cost of owning the home for 12 months without spending anything on utilities.

Provide an appropriate response.

183) In the linear equation, y = mx + b, b is the ? of the equation. 183) _____

A) x–intercept B) y–intercept C) domain D) slope

184) In the linear equation, y = mx + b, m is the ? of the equation. 184) _____

A) range B) slope C) y–intercept D) x–intercept

185) In the linear equation, $y = -10 - 15x$, -10 is the ? of the equation. 185) _____

A) domain B) x–intercept C) slope D) y–intercept

186) If the y–intercept of the linear equation $y = 4x + b$ lies below the x–axis, then what can you say about b? 186) _____

A) $b = 0$ B) $b < 0$ C) $b > 0$ D) $b \geq 0$

187) If $m > 0$, the graph of $y = mx + b$? . 187) _____

A) slopes upward to the right B) is somewhat flat
C) slopes downward to the right D) is a vertical line

188) For the equation $y = mx + b$, find a formula for the value of x given any value of y. 188) _____

A) $x = y - mx - b$ B) $x = \frac{y + b}{m}$ C) $x = \frac{y - b}{m}$ D) $x = \frac{my - b}{b}$

189) A line passes through the points (4, 3) and (4, 4). The equation of this line is ? . The slope of the line is ? . 189) _____

A) $x = 4$; undefined B) $y = 4$; undefined
C) $y = 4$; 0 D) $x = 4$; 0

190) A line passes through the points (5, 10) and (10, 10). The equation of this line is ? . The slope of the line is ? . 190) _____

A) $x = 10$; 0 B) $y = 10$; undefined
C) $x = 10$; undefined D) $y = 10$; 0

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

191) Can an equation of a vertical line be written in slope–intercept form? Explain. 191) _____

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

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

192) 192) _____

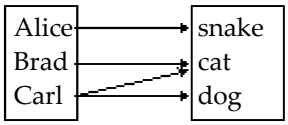
4	→	24
5	→	30
6	→	36
7	→	42

A) domain:{24, 30, 36, 42}
range: {4, 5, 6, 7}
function

B) domain: {4, 5, 6, 7}
range: {24, 30, 36, 42}
function

C) domain:{24, 30, 36, 42}
range: {4, 5, 6, 7}
not a function

D) domain: {4, 5, 6, 7}
range: {24, 30, 36, 42}
not a function

193) 

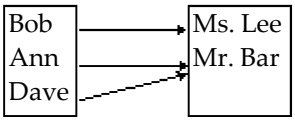
193) _____

A) domain: {snake, cat, dog}
range: {Alice, Brad, Carl}
function

B) domain: {snake, cat, dog}
range: {Alice, Brad, Carl}
not a function

C) domain: {Alice, Brad, Carl}
range: {snake, cat, dog}
not a function

D) domain: {Alice, Brad, Carl}
range: {snake, cat, dog}
function

194) 

194) _____

A) domain: {Bob, Ann, Dave}
range: {Ms. Lee, Mr. Bar}
not a function

B) domain: {Ms. Lee, Mr. Bar}
range: {Bob, Ann, Dave}
not a function

C) domain: {Bob, Ann, Dave}
range: {Ms. Lee, Mr. Bar}
function

D) domain: {Ms. Lee, Mr. Bar}
range: {Bob, Ann, Dave}
function

195)

x	6	7	6	2
y	13	4	5	14

195) _____

A) domain: {6, 2, 7}
range: {5, 14, 4, 13}
not a function

B) domain: {5, 14, 4, 13}
range: {6, 2, 7}
not a function

C) domain: {6, 2, 7}
range: {5, 14, 4, 13}
function

D) domain: {5, 14, 4, 13}
range: {6, 2, 7}
function

196)

x	–7	–1	1	7
y	1	4	1	4

196) _____

A) domain: {–7,–1, 1, 7}
range: { 1, 4}
function

B) domain: { 1, 4}
range: {–7,–1, 1, 7}
not a function

C) domain: {–7,–1, 1, 7}
range: { 1, 4}
not a function

D) domain: { 1, 4}
range: {–7,–1, 1, 7}
function

Determine whether the equation defines y as a function of x.

197) $y = 5x + 3$

197) _____

A) Yes

B) No

198) $2x = 13 - 5y$

198) _____

A) Yes

B) No

199) $y = x^2 - 4$ 199) _____
A) Yes B) No

200) $y = 3x^2 - 2x - 7$ 200) _____
A) Yes B) No

201) $x = y^3$ 201) _____
A) Yes B) No

202) $x = y^2 + 3$ 202) _____
A) Yes B) No

203) $x = |-3y|$ 203) _____
A) Yes B) No

204) $y^2 = 5x$ 204) _____
A) Yes B) No

205) $y = \sqrt{3x - 4}$ 205) _____
A) Yes B) No

206) $xy = -2$ 206) _____
A) Yes B) No

Find the function value.

207) Let $f(x) = x^2 - 2x + 5$. Find $f(4)$. 207) _____
A) 13 B) 19 C) 29 D) 3

208) Let $f(x) = \frac{x}{7 - x}$. Find $f\left(-\frac{4}{5}\right)$. 208) _____
A) $\frac{39}{4}$ B) $-\frac{39}{4}$ C) $-\frac{4}{39}$ D) $\frac{4}{39}$

209) Let $g(x) = \frac{x - 2}{x + 7}$. Find $g(-11.25)$. 209) _____
A) $\frac{37}{73}$ B) $\frac{53}{17}$ C) 1 D) $-\frac{37}{73}$

210) Let $g(x) = \frac{x}{\sqrt{4 - x^2}}$. Find $g(0)$. 210) _____
A) does not exist B) 0 C) 4 D) 1

211) Let $f(x) = 9x^2 - 7x + 6$. Find $f(-x)$. 211) _____
A) $9x^2 + 7x + 6$ B) $8x^2 + 8x + 5$ C) $-9x^2 + 8x + 6$ D) $-9x^2 + 7x - 6$

212) Let $g(x) = 4x^3$. Find $g(3 + h)$. 212) _____

A) $108 + 108h + 36h^2 + 4h^3$
B) $27 + 27h + 36h^2 + 5h^3$
C) $-108 + 108h - 12h^2 + h^3$
D) $108 - 108h + 24h^2 - 4h^3$

213) Let $f(x) = 4|x| + 2x$. Find $f(4y)$. 213) _____

A) $15|y| + 10y$ B) $4|y| + 4y$ C) $16|y| + 8y$ D) $4|y| + 2y$

214) Let $h(x) = 5x - \sqrt{x^2 - 2}$. Find $h(-x)$. 214) _____

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

Find the domain of the function.

215) $f(x) = 2x - 6$ 215) _____

A) $(6, \infty)$ B) $(-\infty, \infty)$ C) $(0, \infty)$ D) $(-\infty, 0) \cup (0, \infty)$

216) $f(x) = \dfrac{x}{x - 9}$ 216) _____

A) $(-\infty, 9) \cup (9, \infty)$
B) $(-\infty, 0)$
C) $(-\infty, -9) \cup (-9, \infty)$
D) $(0, \infty)$

217) $f(x) = \dfrac{6}{x + 2}$ 217) _____

A) $(-\infty, \infty)$
B) $(-\infty, -2) \cup (-2, \infty)$
C) $(-\infty, 2)$
D) $(-\infty, 0) \cup (0, \infty)$

218) $f(x) = \dfrac{1}{x^2 + 3x - 10}$ 218) _____

A) $(-\infty, -5) \cup (-5, \infty)$
B) $(-\infty, \infty)$
C) $(-\infty, 2) \cup (2, \infty)$
D) $(-\infty, -5) \cup (-5, 2) \cup (2, \infty)$

219) $f(x) = \dfrac{x^4 - 8x^3 + 9}{3x^2 - 7x - 20}$ 219) _____

A) $\left(-\infty, -\frac{5}{3}\right) \cup \left(-\frac{5}{3}, \infty\right)$
B) $(-\infty, 4) \cup (4, \infty)$
C) $(-\infty, -4) \cup \left(-4, \frac{5}{3}\right) \cup \left(\frac{5}{3}, \infty\right)$
D) $\left(-\infty, -\frac{5}{3}\right) \cup \left(-\frac{5}{3}, 4\right) \cup (4, \infty)$

220) $f(x) = \sqrt{1 - x}$ 220) _____

A) $(-\infty, 1]$ B) $(-\infty, \infty)$ C) $(\sqrt{1}, \infty)$ D) $(-\infty, 1) \cup (1, \infty)$

221) $f(x) = \dfrac{(x + 5)(x - 5)}{x^2 - 25}$ 221) _____

A) $(25, \infty)$
B) $(-\infty, -5) \cup (-5, 5) \cup (5, \infty)$
C) $(-\infty, 25) \cup (25, \infty)$
D) $(-\infty, \infty)$

222) $f(x) = \dfrac{(x + 2)(x - 2)}{x^2 + 4}$ 222) _____

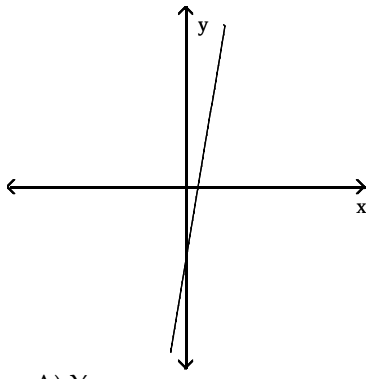
A) $(-\infty, \infty)$ B) $(-\infty, 4) \cup (4, \infty)$
C) $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$ D) $(4, \infty)$

223) $H(x) = \dfrac{x}{\sqrt{x - 1}}$ 223) _____

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

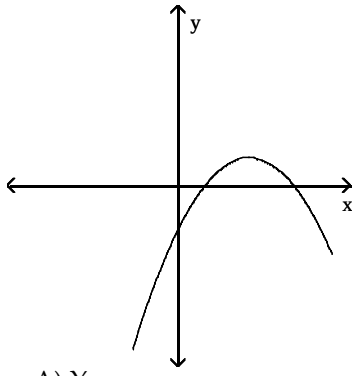
Use the vertical–line test to determine whether the graph represents a function.

224) 224) _____



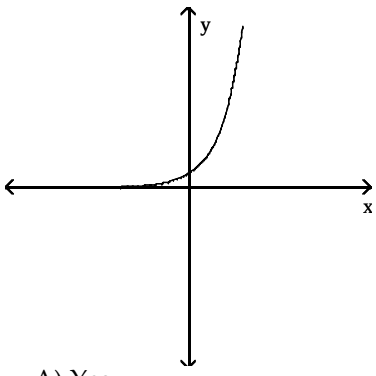
A) Yes B) No

225) 225) _____

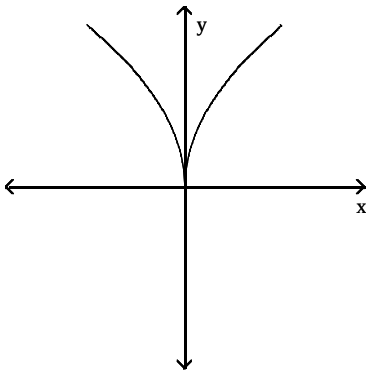


A) Yes B) No

226) 226) _____

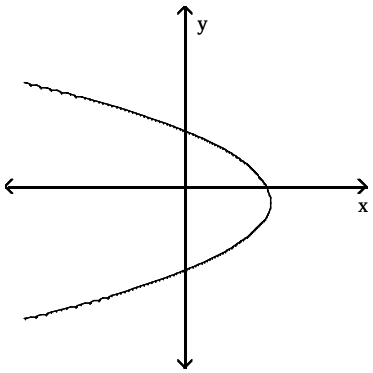


A) Yes B) No

227) 

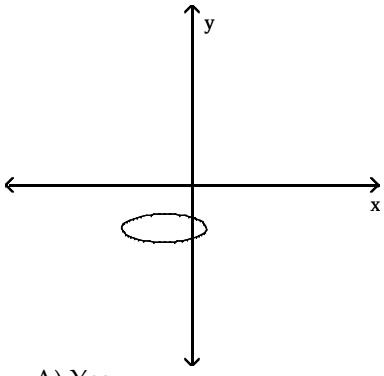
227) _____

A) Yes B) No

228) 

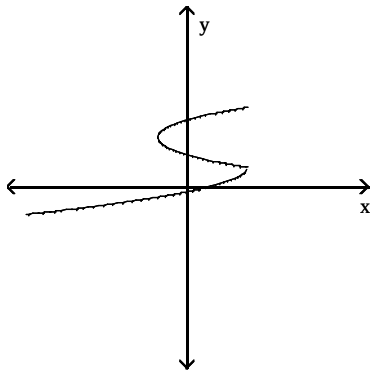
228) _____

A) Yes B) No

229) 

229) _____

A) Yes B) No

230) 

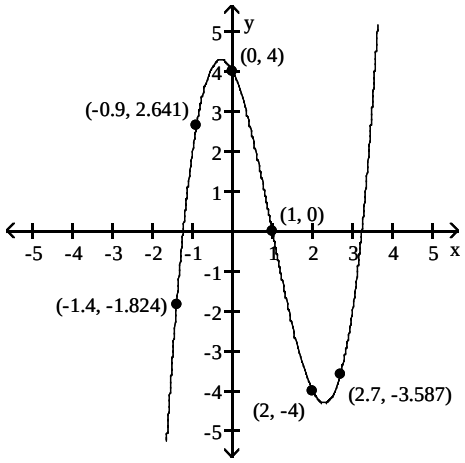
230) _____

A) Yes B) No

The graph of a function is given. Find the indicated function value.

231) f(2)

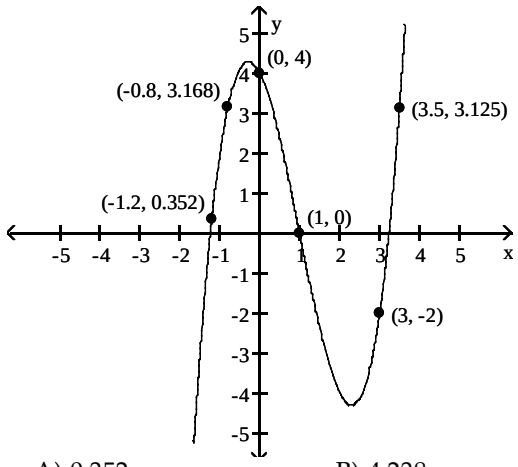
231) _____



A) 1 B) –4 C) 2.1 D) –1.34

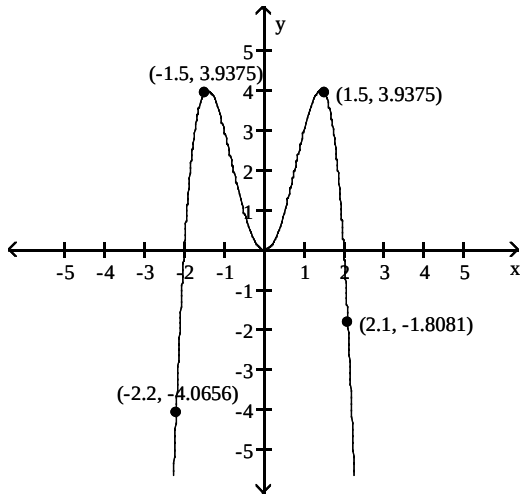
232) g(–1.2)

232) _____



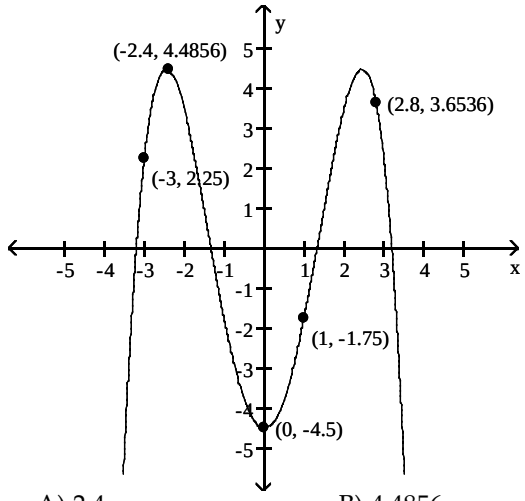
A) 0.352 B) 4.238 C) –2.5 D) 3

233) g(−1.5) 233) _____



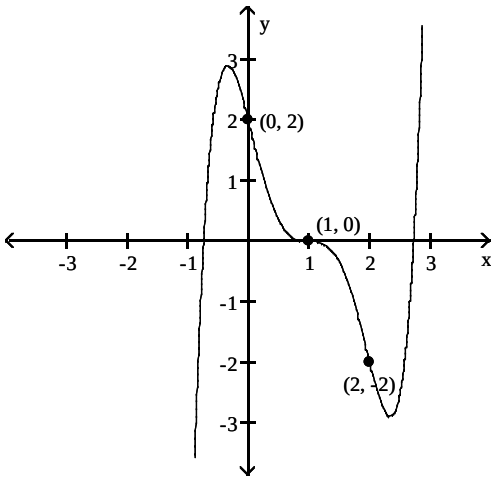
A) 2.1 B) 1.5 C) −1.8081 D) 3.9375

234) g(−2.4) 234) _____



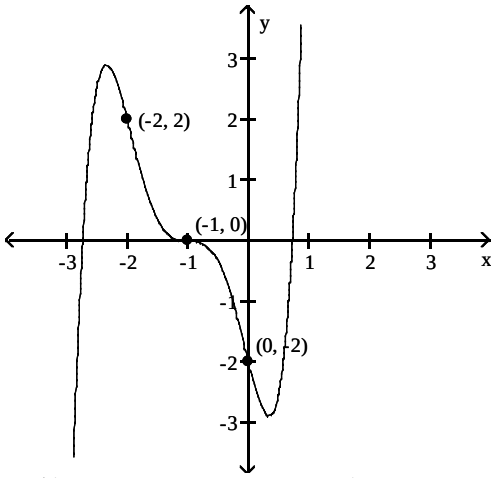
A) 2.4 B) 4.4856 C) 1 D) −1.75

235) f(1) 235) _____



A) 1 B) –2 C) 2 D) 0

236) g(–1) 236) _____



A) 2 B) 1 C) 0 D) –2

Solve the problem.

237) Let $g(x) = x^2 - 4x - 25$. Find x such that (x, 7) is on the graph of f(x). 237) _____

A) x = 8 B) no solution C) x = –4 or 8 D) x = –8 or 4

238) Let $h(x) = x^2 + 4x + 11$. Find x such that (x, 3) is on the graph of h(x). 238) _____

A) x = 0 B) $x = 4 \pm \sqrt{11}$ C) no solution D) $x = -4 \pm \sqrt{3}$

239) Let $f(x) = 4(x - 4)^2 + 8$. Find x such that (x, 20) is on the graph of f(x). 239) _____

A) no solution B) $x = 4 \pm \sqrt{3}$ C) $x = 4 \pm \sqrt{7}$ D) $x = -4 \pm \sqrt{3}$

240) Let $H(x) = 3x^2 - 12x$. Find x such that (x, –12) is on the graph of H(x). 240) _____

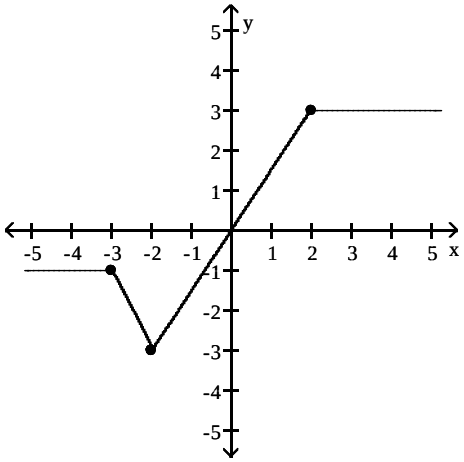
A) x = –2 B) x = ±2 C) x = 2 D) no solution

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

Use the graph of the function to find the following:

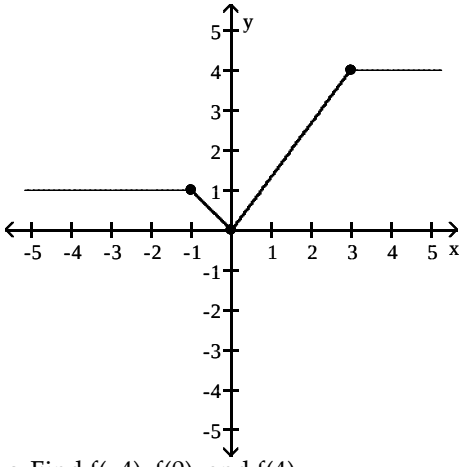
a. the domain and range of the function;
b. the intercepts, if any;
c. the indicated function values; and
d. the value of x given the function value.

241) 241) _____



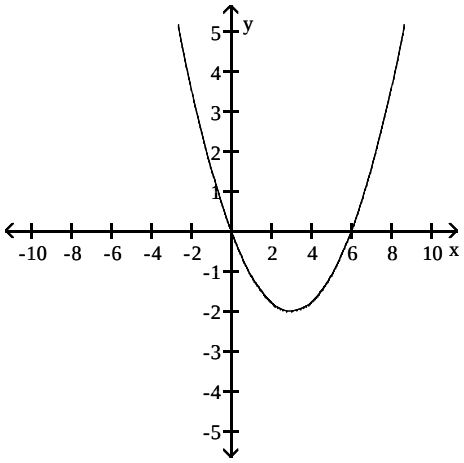
c. Find f(–4), f(–2), and f(2).
d. Solve f(x) = 3.

242) 242) _____



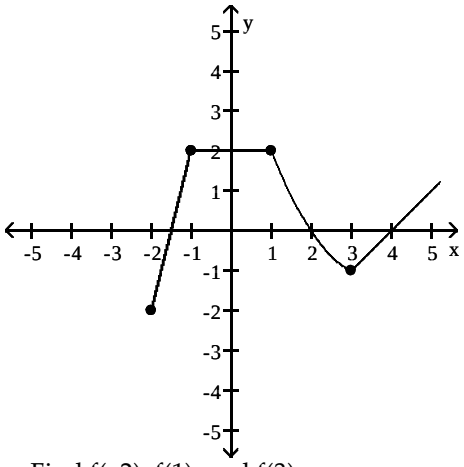
c. Find f(–4), f(0), and f(4).
d. Solve f(x) = –2.

243) 243) _____



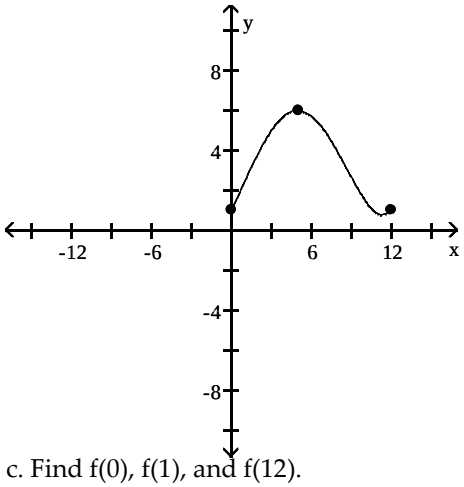
c. Find f(0) and f(6).
d. Solve f(x) = –4.

244) 244) _____



c. Find f(–2), f(1), and f(3).
d. Solve f(x) = 2.

245) 245) _____



c. Find f(0), f(1), and f(12).
d. Solve f(x) = 6.

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

State whether the given relation is a function.

246) Consider the relation whose domain is all students attending Laughlin Community College and whose range values are a set of the students' Social Security numbers. Is this relation a function? 246) _____

A) Yes B) No

247) Consider a relation whose domain is all students attending the University of Ohio and whose range values are a set of each students' teachers. Is this relation a function? 247) _____

A) Yes B) No

248) Is a function generated in the process of choosing teams from a group of 32 students by counting them off in fours; for example: "1, 2, 3, 4, 1, 2, 3, 4, 1, 2, ..."? 248) _____

A) Yes B) No

Solve the problem.

249) A formula relating an athlete's vertical leap V, in inches, to hang time t, in seconds, is $V(t)= 48t^2$. A professional basketball player has a vertical leap of 35 inches. What is his hang time? Round your answer to the nearest tenth of a second. 249) _____

A) 0.6 sec B) 0.7 sec C) 0.9 sec D) 1 sec

250) A stone thrown downward with an initial velocity of 39.2 m/sec will travel a distance of *s* meters, where $s(t) = 4.9t^2 + 39.2t$ and t is in seconds. If a stone is thrown downward at 39.2 m/sec from a height of 514.5 m, how long will it take the stone to hit the ground? Round your answer to the nearest second. 250) _____

A) 7 sec B) 22 sec C) 8 sec D) 15 sec

251) If there are x teams in a sports league and all the teams play each other twice, a total of N(x) games are played, where $N(x) = x^2 - x$. A soccer league has 10 teams, each of which plays the others twice. If the league pays $47 per game for the field and officials, how much will it cost to play the entire schedule? 251) _____

A) $4324 B) $4700 C) $4230 D) $5170

252) Under certain conditions, the power P, in watts per hour, generated by a windmill with winds blowing v miles per hour is given by $P(v) = 0.015v^3$. Find the power generated by 14–mph winds. 252) _____

A) 0.00004725 watts per hr B) 2.94 watts per hr
C) 2744 watts per hr D) 41.16 watts per hr

253) Assume that a person's threshold weight W, defined as the weight above which the risk of death rises dramatically, is given by $W(h) = \left(\frac{h}{12.3}\right)^3$, where W is in pounds and h is the person's height in inches. Find the threshold weight for a person who is 6 ft 7 in. tall. Round your answer to the nearest pound. 253) _____

A) 221.5 lb B) 265 lb C) 296.3 lb D) 161.6 lb

254) The function, $S(x) = 0.0048x^4 + 0.0054x^3 + 0.0052x^2 + 0.18x + 1.7$, gives the predicted sales volume of a company, in millions of items, where x is the number of years from now. Determine the predicted sales 6 years from now. Round your answer to two decimals, if necessary. 254) _____

A) 23.93 million B) 10.35 million C) 13.27 million D) 9.9 million

255) $A(x) = -0.015x^3 + 1.05x$ gives the alcohol level in an average person's bloodstream x hours after drinking 8 oz of 100–proof whiskey. If the level exceeds 1.5 units, a person is legally drunk. Would a person be drunk after 3 hours? 255) _____

A) Yes B) No

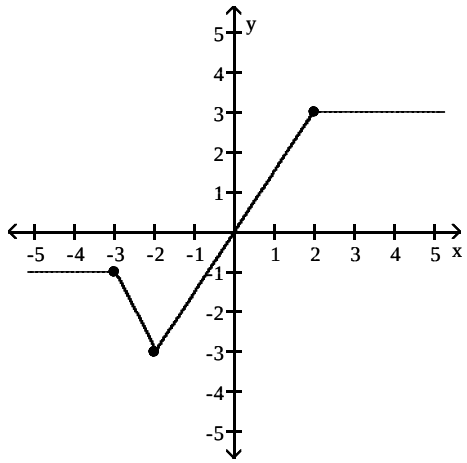
256) The position of an object moving in a straight line is given by $s(t) = 11t^2 - 7t$, where s is in meters and t is the time in seconds the object has been in motion. How far will an object move in 11 seconds? 256) _____

A) 726 m B) 484 m C) 44 m D) 1254 m

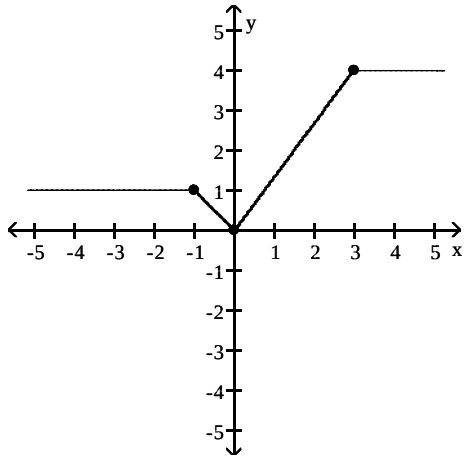
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

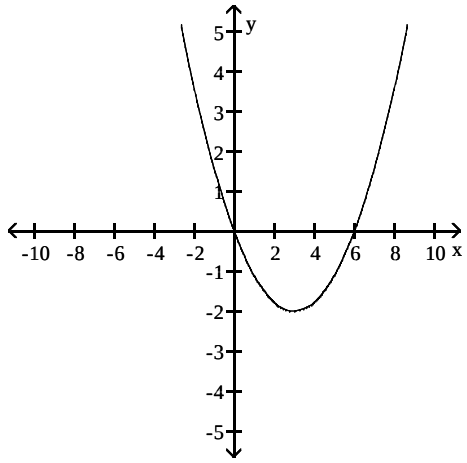
Use the graph of the function to find the following: a. the domain and range of the function; b. the intercepts, if any; c. the intervals on which the function is increasing, decreasing, or is constant; d. whether the function is even, odd, or neither.

257) 257) _____

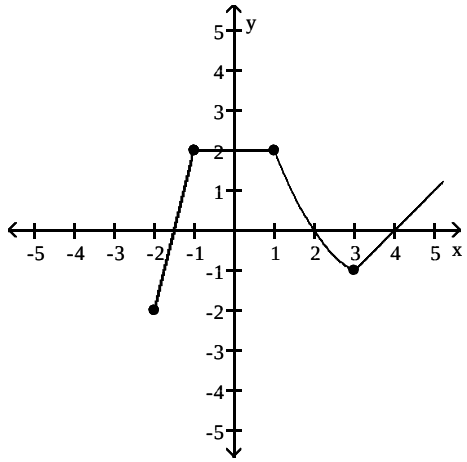


258) 258) _____

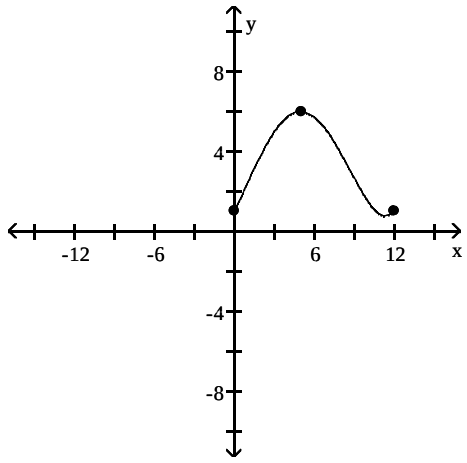


259) 

259) _____

260) 

260) _____

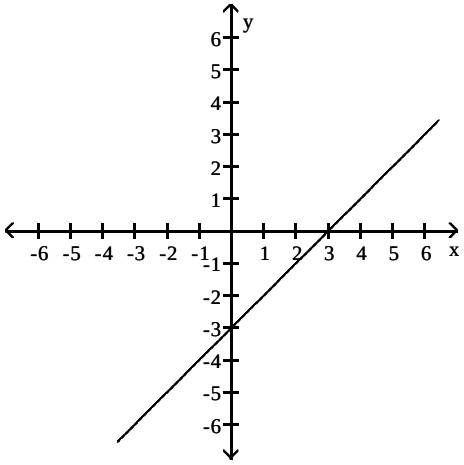
261) 

261) _____

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

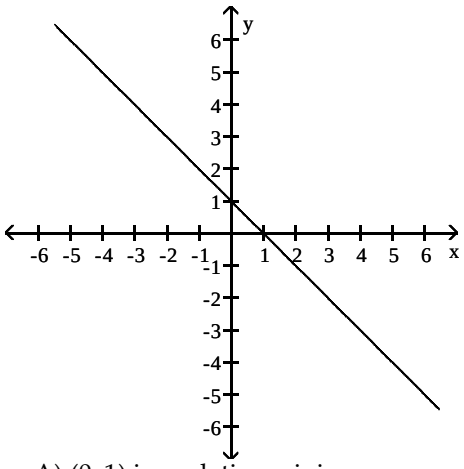
Locate relative maximum and relative minimum points on the graph. State whether each relative extremum point is a turning point.

262) 262) _____



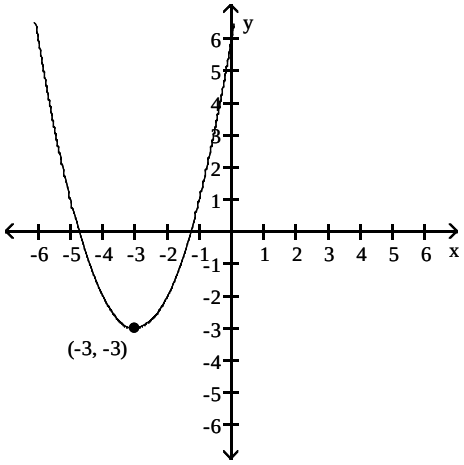
A) No relative extrema.
B) (–3, 0) is a relative minimum.
C) (0, –3) is a relative maximum.
D) (0, –3) is a relative minimum.

263) 263) _____



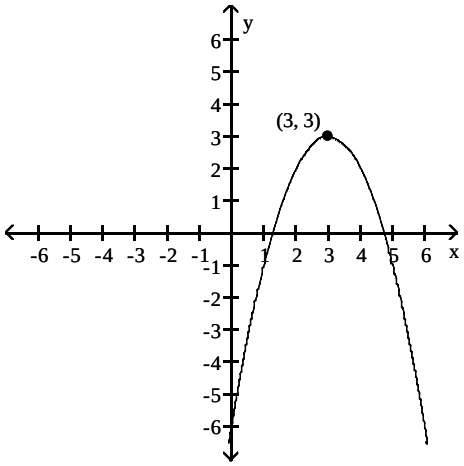
A) (0, 1) is a relative minimum.
B) (1, 0) is a relative minimum.
C) (1, 0) is a relative maximum.
D) No relative extrema.

264) 264) _____



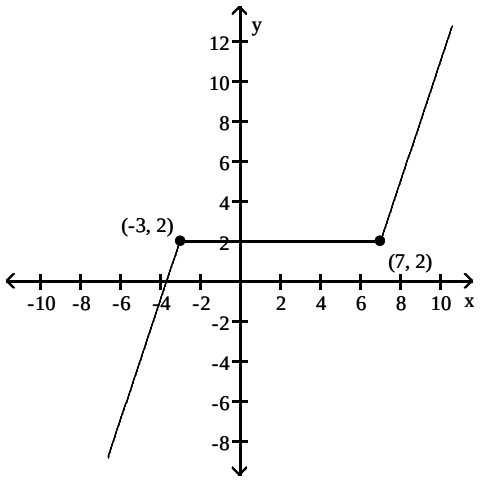
A) (–3, –3) is a relative minimum and a turning point.
B) (–3, –3) is a relative maximum.
C) (–3, –3) is a relative minimum and a turning point. (0, 0) is a relative maximum.
D) No relative extrema.

265) 265) _____



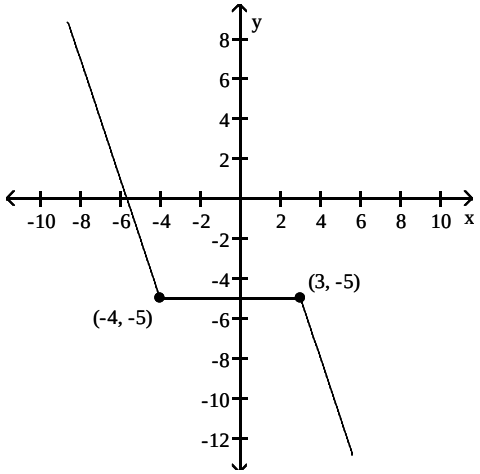
A) No relative extrema.
B) (3, 0) is a relative maximum.
C) (3, 3) is a relative maximum and a turning point.
D) (3, 3) is a relative minimum and a turning point.

266) 266) _____



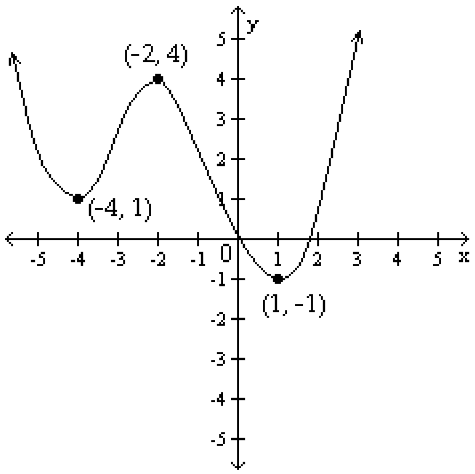
A) (–3, 2) and (7, 2) are relative maxima and minima points; neither of these points are turning points
B) Any point (x, 2) is a relative maximum and a relative minimum point on the interval (–3, 7); both (–3, 2) and (7, 2) are turning points.
C) Any point (x, 2) is a relative maximum and a relative minimum point on the interval (–3, 7); none of these points are turning points.
D) (–3, 2) and (7, 2) are relative maxima and minima points; both of these points are turning points

267) 267) _____



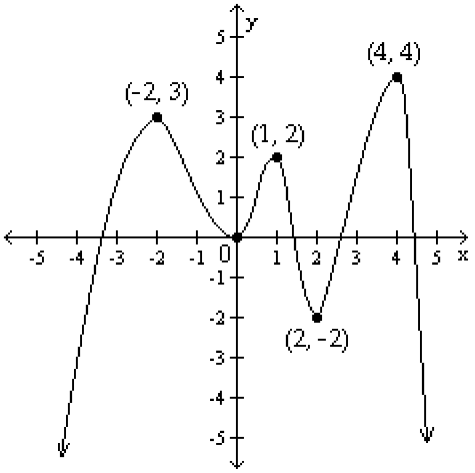
A) (–4, –5) and (3, –5) are relative maxima and minima points; both of these points are turning points
B) Any point (x, –5) is a relative maximum and a relative minimum point on the interval (–4, 3); none of these points are turning points.
C) Any point (x, –5) is a relative maximum and a relative minimum point on the interval (–4, 3); both (–4, –5) and (3, –5) are turning points.
D) (–4, –5) and (3, –5) are relative maxima and minima points; neither of these points are turning points

268) 268) _____



A) (–2, 4) is a relative maximum point and a turning point. (–4, 1) and (1, –1) are relative minima points and turning points.
B) (–2, 4) is a relative maximum point and a turning point. (1, –1) is a relative minimum point and a turning point.
C) (–2, 4) is a relative maximum and a turning point. (–4, 1) is a relative minimum point and a turning point.
D) (–2, 4) is a relative maximum. (–4, 1) and (1, –1) are relative minima points.

269) 269) _____



A) (–2, 3), (1, 2), and (4, 4) are relative maxima points. (0, 0) and (2, –2) are relative minima points.
B) (4, 4) is a relative maximum point and a turning point. (2, –2) is a relative minimum point and a turning point.
C) (–2, 3), (1, 2), and (4, 4) are relative maxima points and turning points. (2, –2) is a relative minimum point and a turning point.
D) (–2, 3), (1, 2), and (4, 4) are relative maxima points and turning points. (0, 0) and (2, –2) are relative minima points and turning points.

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

270) $f(x) = 2x^2 - 2$ 270) _____

A) Even B) Odd C) Neither

271) $f(x) = -6x^5 + 5x^3$ 271) _____

A) Even B) Odd C) Neither

272) $f(x) = 7x^4 + 5x + 4$ 272) _____

A) Even B) Odd C) Neither

273) $f(x) = -2$ 273) _____

A) Even B) Odd C) Neither

274) $f(x) = \frac{1}{x^2}$ 274) _____

A) Even B) Odd C) Neither

275) $f(x) = \frac{x}{x^2 - 3}$ 275) _____

A) Even B) Odd C) Neither

276) $f(x) = \frac{-x^3}{5x^2 + 2}$ 276) _____

A) Even B) Odd C) Neither

277) 277) _____

x	−3	−2	−1	0	1	2	3
f(x)	−25.5	−12	−7.49	5	−7.49	−12	−25.5

A) Even B) Odd C) Neither

Find the average rate of change of the function as x changes from a to b.

278) $f(x) = -4x + 5$; $a = 1$, $b = 5$ 278) _____

A) 4 B) $-\frac{1}{4}$ C) −4 D) 0

279) $g(x) = 3x - 8$; $a = 4$, $b = 6$ 279) _____

A) $\frac{1}{3}$ B) 0 C) −3 D) 3

280) $h(x) = 5x^2$; $a = 1$, $b = 5$ 280) _____

A) 30 B) 20 C) −30 D) −20

281) $f(x) = x^2 - 2$; $a = 1$, $b = 5$ 281) _____

A) −4 B) 0 C) −6 D) 6

282) $g(x) = 5 - x^2$; $a = -1$, $b = 6$ 282) _____

A) 5 B) 7 C) −7 D) −5

283) $h(x) = (8 - x)^2$; $a = 2$, $b = 6$ 283) _____

A) 24 B) –8 C) –20 D) 0

284) $g(x) = (x - 2)^2$; $a = 3$, $b = 8$ 284) _____

A) –1 B) 7 C) –9 D) 15

285) $f(x) = -x^3$; $a = -2$, $b = 3$ 285) _____

A) 19 B) 7 C) –7 D) –11

286) $h(x) = \frac{2}{x}$; $a = -2$, $b = 4$ 286) _____

A) $\frac{1}{4}$ B) 0 C) 1 D) $-\frac{1}{4}$

287) $g(x) = \frac{3}{x + 2}$; $a = 3$, $b = 5$ 287) _____

A) $\frac{3}{35}$ B) $-\frac{9}{35}$ C) $-\frac{3}{35}$ D) $-\frac{6}{35}$

Compute $\frac{f(x + h) - f(x)}{h}$ ($h \neq 0$) for the given function.

288) $f(x) = 3x - 10$ 288) _____

A) 3 B) –3h C) $\frac{10}{3}$ D) 10

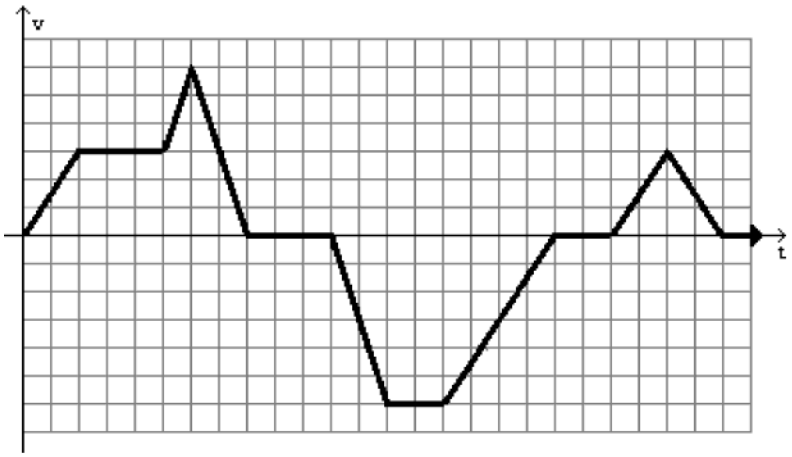
289) $f(x) = 5x^2 + 6x$ 289) _____

A) $10x + 5h + 6$ B) $10x^2 + 5h + 6x$ C) $15x - 7h + 12$ D) $10x + 6$

290) $f(x) = \frac{1}{3x}$ 290) _____

A) $\frac{-1}{3x(x + h)}$ B) $\frac{1}{3x}$ C) $\frac{-1}{x(x + h)}$ D) 0

Use the accompanying graph of a particle moving on a coordinate line with velocity v = f(t) in ft/sec at time t seconds. The axes are marked off at one–unit intervals. Use these terms to describe the motion state: moving forward/backward, increasing/decreasing speed, and resting. Recall that speed = |velocity|.



291) Give the interval(s) when the particle is moving forward. 291) _____

A) (0, 8) and (21, 25) B) (0, 11) and (19, 25)
C) (8, 11) and (19, 21) D) (11, 19)

292) Give the interval(s) when the particle is moving backward. 292) _____

A) (8, 11) and (19, 21) B) (8, 21)
C) (0, 8) and (21, 25) D) (11, 19)

293) Give the interval(s) when the particle is at rest. 293) _____

A) (8, 11), (19, 21), and (25, 26) B) The particle is never at rest.
C) (8, 21) D) (11, 19)

294) Give the interval(s) when the speed of the particle is increasing. 294) _____

A) (0, 2), (5, 6), (11, 13), and (21, 23) B) (0, 6), (11, 15), and (19, 23)
C) (0, 2), (5, 6), and (21, 23) D) (0, 2), (5, 6), and (11, 13)

295) Give the interval(s) when the speed of the particle is decreasing. 295) _____

A) (6, 11), (15, 17), and (23, 25) B) (6, 8), (15, 19), and (23, 25)
C) (6, 11), (15, 21), and (23, 25) D) (6, 8), (11, 19), and (23, 25)

Solve the problem.

296) A salesperson gets a commission of $1600 for the first $10,000 of sales, and then $800 for each additional $10,000 or partial of sales. Let S(x) represent the commission on x dollars of sales. Find the value of S(75,000). 296) _____

A) $6000 B) $6800 C) $7200 D) $7600

297) The cost of manufacturing a molded part is related to the quantity of parts produced during a production run. When 100 parts are produced, the cost is $300. When 400 parts are produced, the cost is $3000. What is the average cost per part? 297) _____

A) $6.75 per part B) $0.11 per part C) $10.00 per part D) $9.00 per part

298) A rectangular piece of cardboard measuring 20 inches by 50 inches is to be made into a box with an open top by cutting equal size squares from each corner and folding up the sides. Let x represent the length of a side of each such square. For what value of x will the volume be a maximum? If necessary, round to 2 decimal places. 298) _____

A) 18.93 in. B) 37.86 in. C) 22.07 in. D) 4.4 in.

299) John owns a hotdog stand. He has found that his profit is represented by the equation $P = -x^2 + 76x + 81$, with P being profits and x the number of hotdogs. How many hotdogs must he sell to earn the most profit? 299) _____

A) 38 hotdogs B) 21 hotdogs C) 39 hotdogs D) 43 hotdogs

300) Bob owns a watch repair shop. He has found that the cost of operating his shop is given by $c(x) = 3x^2 - 156x + 68$, where x is the number of watches repaired. How many watches must he repair to have the lowest cost? 300) _____

A) 68 watches B) 26 watches C) 30 watches D) 34 watches

301) April shoots an arrow upward into the air at a speed of 32 feet per second from a platform that is 19 feet high. The height of the arrow is given by the function $h(t) = -16t^2 + 32t + 19$, where t is the time is seconds. What is the maximum height of the arrow? 301) _____

A) 18 ft B) 16 ft C) 35 ft D) 19 ft

Write a linear function f that has the indicated values.

302) $f(5) = 2, f(0) = 6$ 302) _____

A) $f(x) = -\frac{4}{5}x + 6$ B) $f(x) = -\frac{1}{2}x + 6$ C) $f(x) = \frac{1}{2}x + 6$ D) $f(x) = \frac{4}{5}x + 6$

303) $f(7) = 0, f(-6) = 2$ 303) _____

A) $f(x) = -\frac{7}{8}x - \frac{13}{4}$ B) $f(x) = \frac{7}{8}x - \frac{13}{4}$

C) $f(x) = -\frac{2}{13}x + \frac{14}{13}$ D) $f(x) = \frac{2}{13}x + \frac{14}{13}$

304) $f(-6) = 1, f(-9) = 5$ 304) _____

A) $f(x) = -\frac{4}{3}x - 7$ B) $f(x) = \frac{1}{2}x + \frac{19}{2}$

C) $f(x) = \frac{4}{3}x - 7$ D) $f(x) = -\frac{1}{2}x + \frac{19}{2}$

305) $f(-6) = 10, f(3) = -7$ 305) _____

A) $f(x) = -\frac{8}{5}x - \frac{11}{5}$ B) $f(x) = \frac{17}{9}x - \frac{4}{3}$

C) $f(x) = \frac{8}{5}x - \frac{11}{5}$ D) $f(x) = -\frac{17}{9}x - \frac{4}{3}$

306) $f(0) = 10, f(-4) = 0$ 306) _____

A) $f(x) = \frac{2}{5}x - 4$ B) $f(x) = -\frac{2}{5}x - 4$ C) $f(x) = -\frac{5}{2}x + 10$ D) $f(x) = \frac{5}{2}x + 10$

Find the requested value.

307) Find f(4) for

$$f(x) = \begin{cases} 5, \text{ if } x < 0 \\ -5, \text{ if } x > 0 \end{cases}$$

307) _____

A) –5 B) –25 C) undefined D) 5

308) Find f(–6) for

$$f(x) = \begin{cases} 9x, & \text{if } x \leq -1 \\ x - 5, \text{ if } x > -1 \end{cases}$$

308) _____

A) 1 B) –11 C) 54 D) –54

309) Find f(0) for

$$f(x) = \begin{cases} x - 8, \text{ if } x < 9 \\ 3 - x, \text{ if } x \geq 9 \end{cases}$$

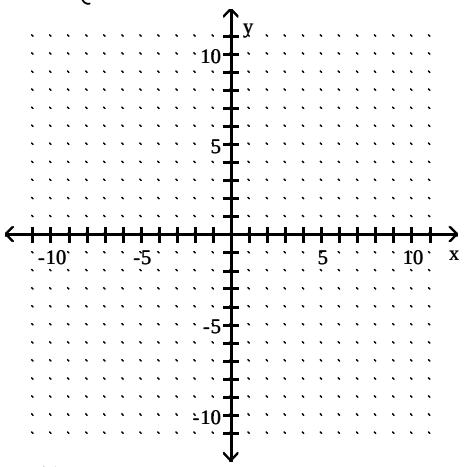
309) _____

A) 1 B) –6 C) –8 D) 3

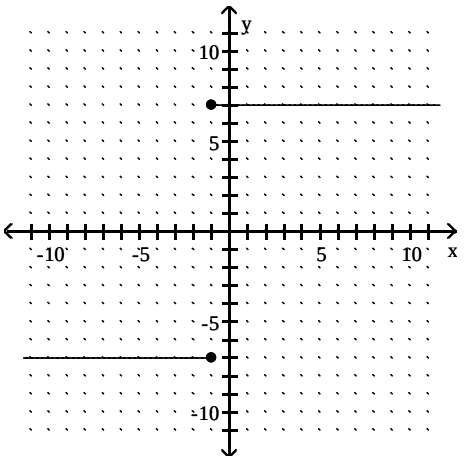
Graph the function.

310) $f(x) = \begin{cases} 7 & \text{if } x > -1 \\ -7 & \text{if } x \leq -1 \end{cases}$

310) _____



A)



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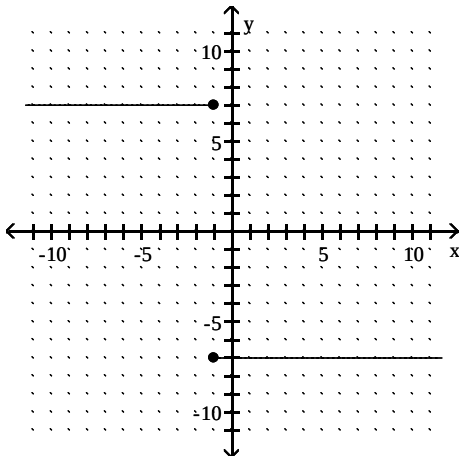

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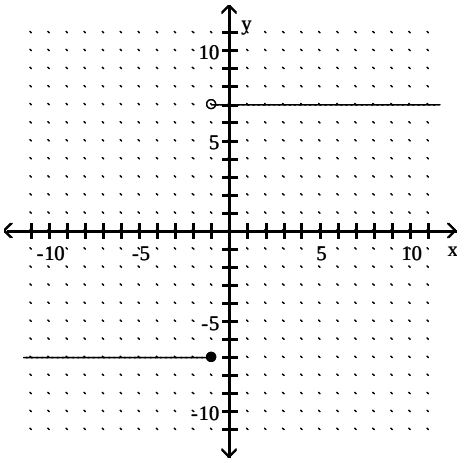

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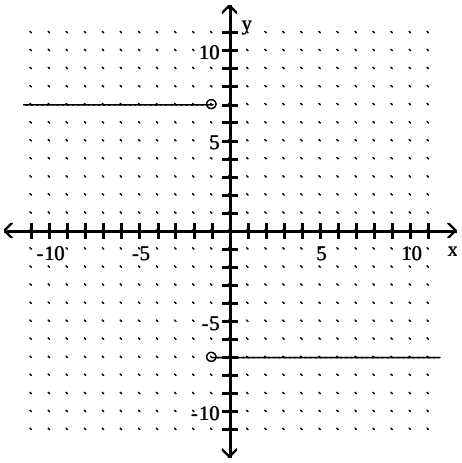
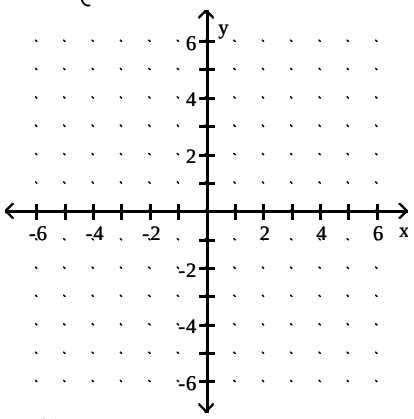
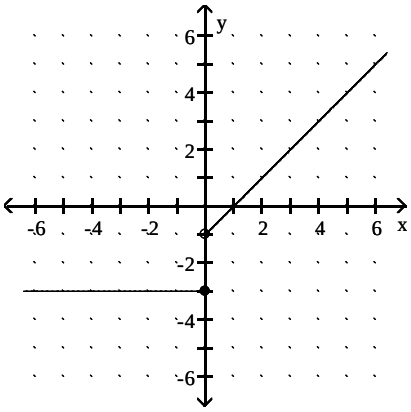


311) $f(x) = \begin{cases} x - 1 & \text{if } x > 0 \\ -3 & \text{if } x \le 0 \end{cases}$

311) _____



A)



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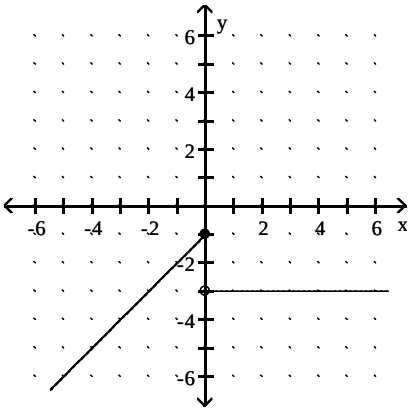

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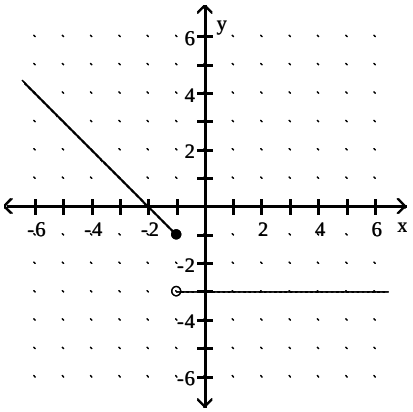
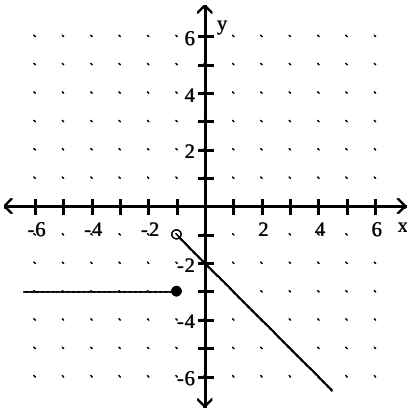
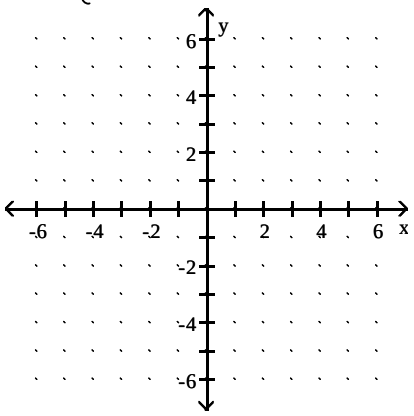


D)

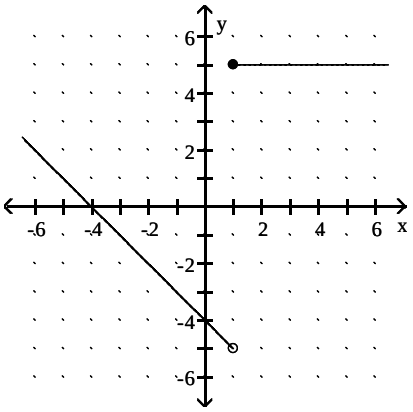


312) $f(x) = \begin{cases} 5 & \text{if } x \geq 1 \\ -4 - x & \text{if } x < 1 \end{cases}$

312) _____



A)



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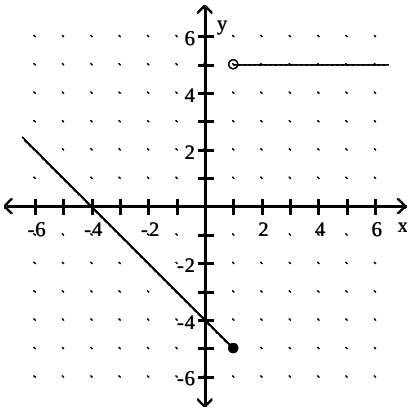

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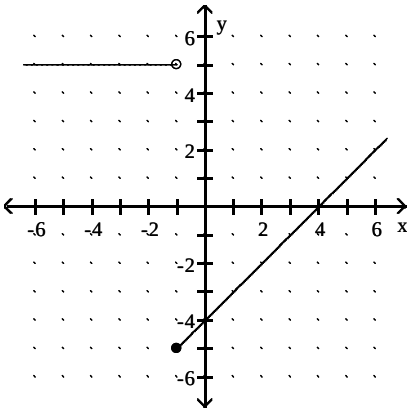

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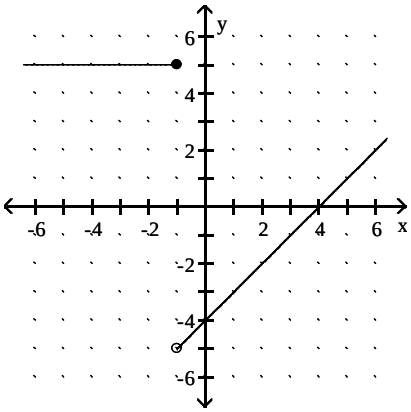
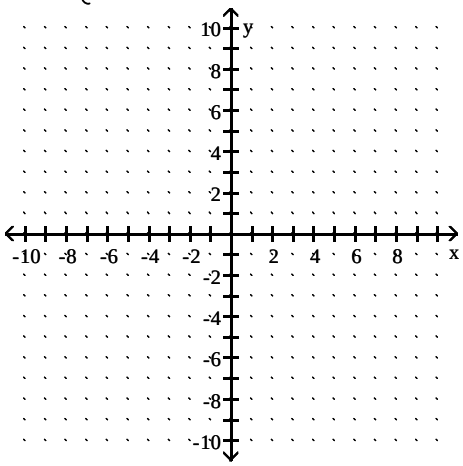
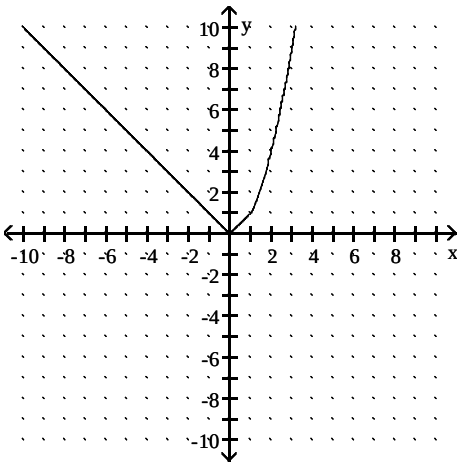


313) $f(x) = \begin{cases} |x| & \text{if } x \le 1 \\ x^2 & \text{if } x > 1 \end{cases}$

313) _____



A)



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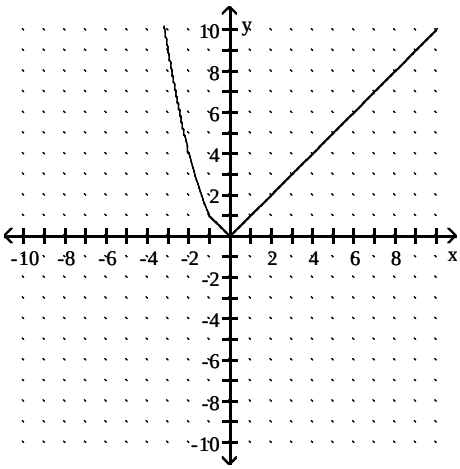

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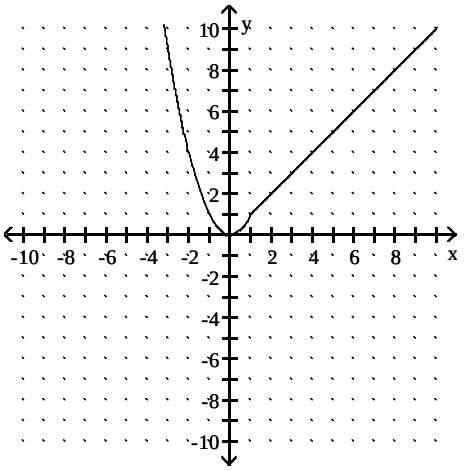

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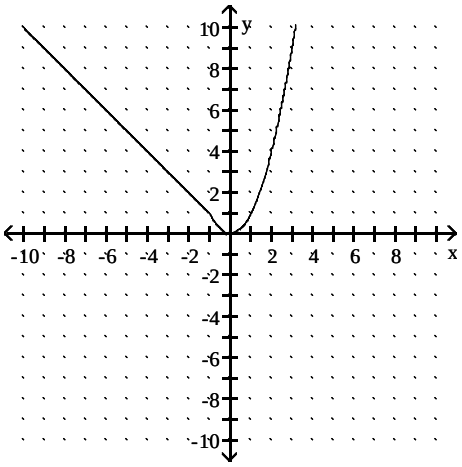
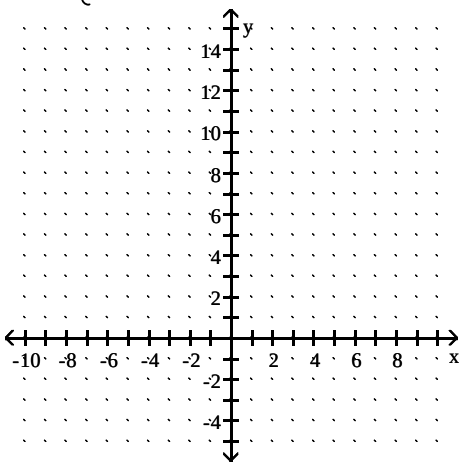
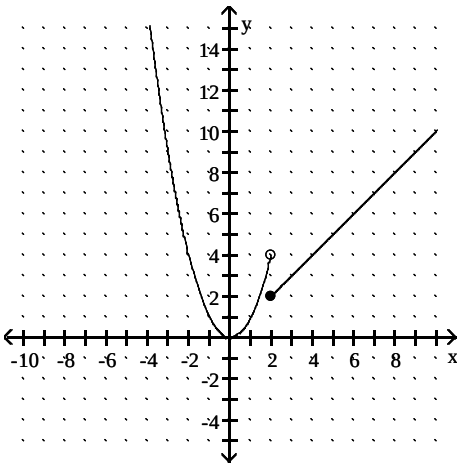


314) $f(x) = \begin{cases} |x| & \text{if } x \le 2 \\ x^2 & \text{if } x > 2 \end{cases}$

314) _____



A)



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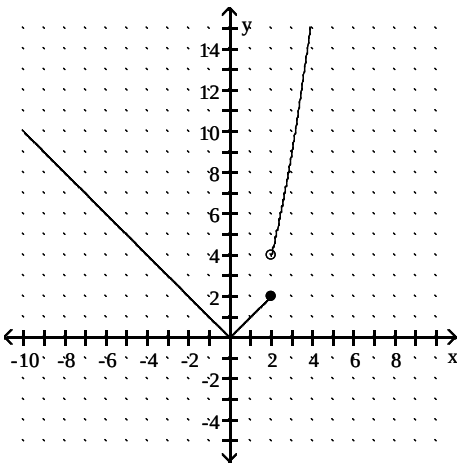
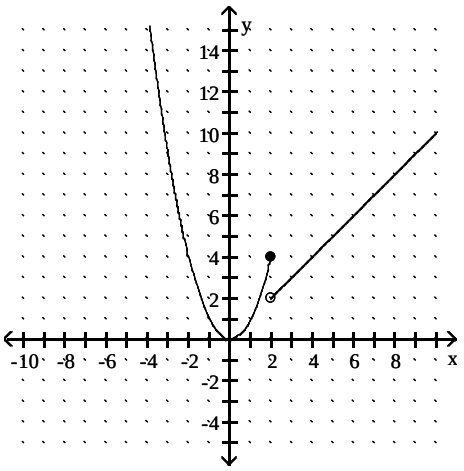
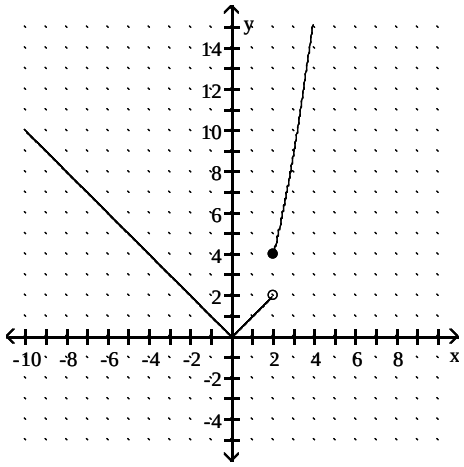


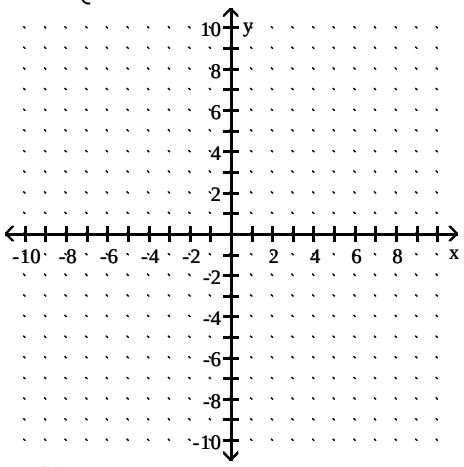
C)



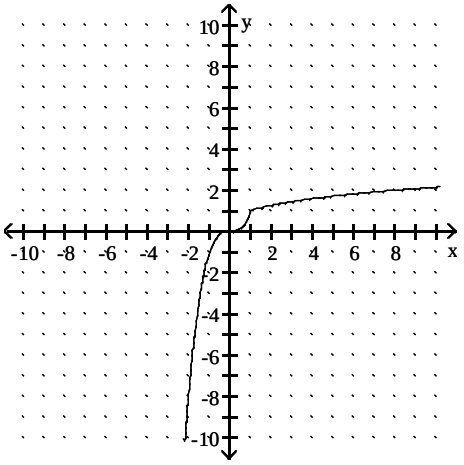
D)



315) $f(x) = \begin{cases} x^3 & \text{if } x \le 1 \\ \sqrt[3]{x} & \text{if } x > 1 \end{cases}$ 315) _____



A)



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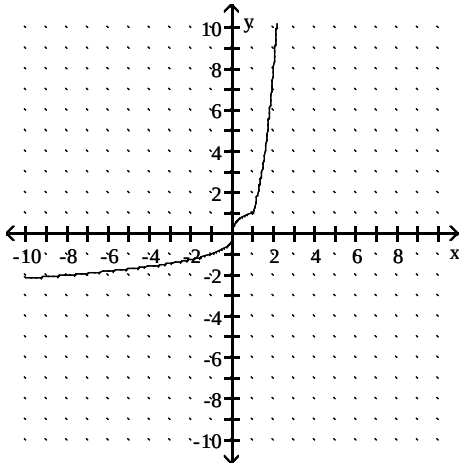

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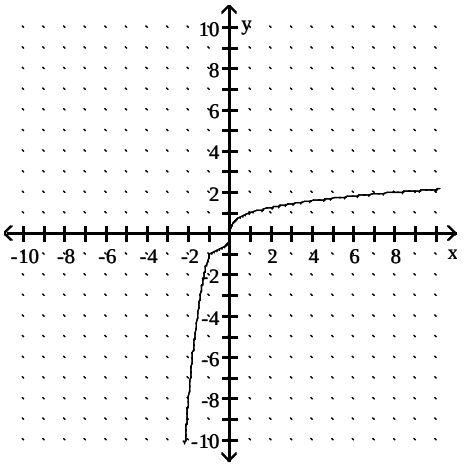

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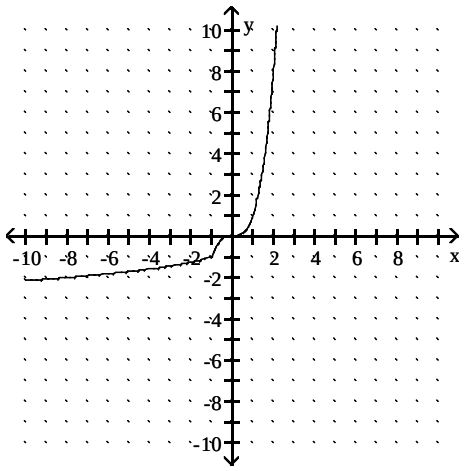
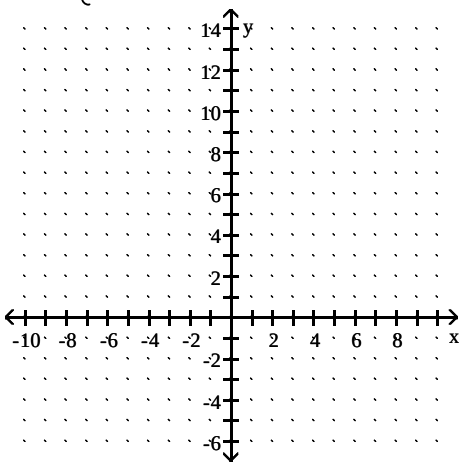
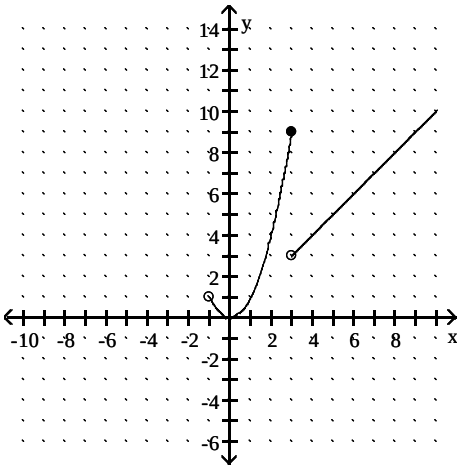


316) $f(x) = \begin{cases} x^2 & \text{if } -1 < x \le 3 \\ x & \text{if } x > 3 \end{cases}$ 316) _____



A)



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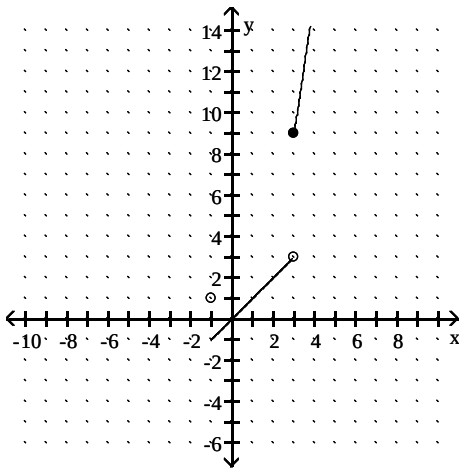

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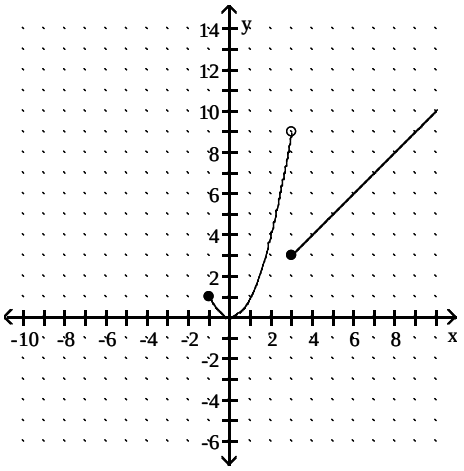
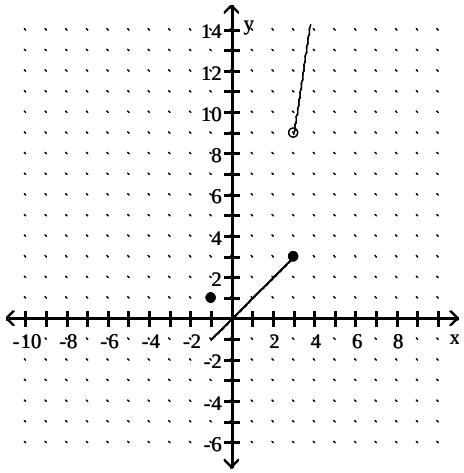
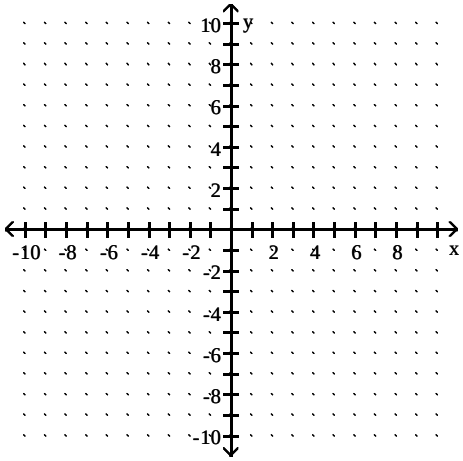


D)

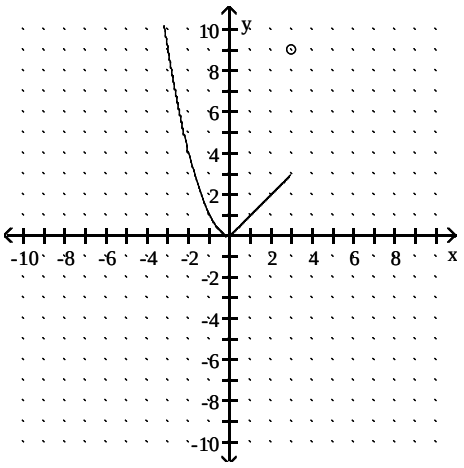


317) $f(x) = \begin{cases} |x| & \text{if } x \le 0 \\ x^2 & \text{if } 0 < x \le 3 \end{cases}$

317) _____



A)



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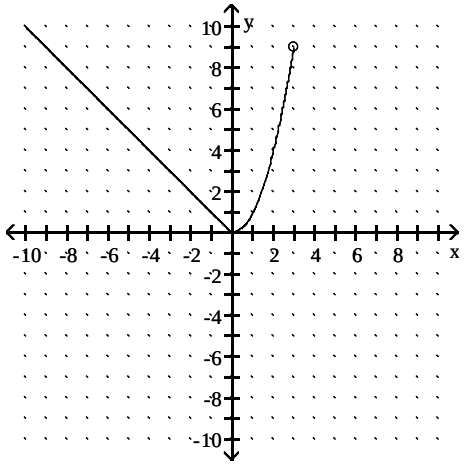

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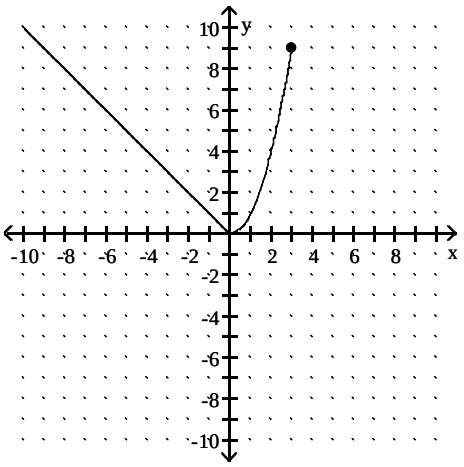
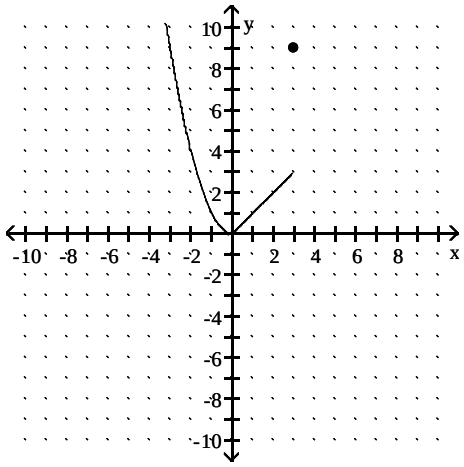


D)



Solve the problem.

318) If an object is dropped off of a tower, the velocity, V, of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Express V as a linear function of t. 318) _____

A) $V(t) = \frac{t-10}{32}$ B) $V(t) = 32 + 10t$ C) $V(t) = 32t + 10$ D) $V(t) = 42t$

319) If an object is dropped from a tower, then the velocity, V (in feet per second), of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Find V as a linear function of t, and use this function to evaluate V(2.9), the velocity of the object at time t = 2.9 seconds. 319) _____

A) V(2.9) = 102.1 ft/sec
B) V(2.9) = 102.8 ft/sec
C) V(2.9) = 100.8 ft/sec
D) V(2.9) = 104.1 ft/sec

320) Assume that the sales of a certain appliance dealer are approximated by a linear function. Suppose that sales were $6500 in 1982 and $87,500 in 1987. Let x = 0 represent 1982. Find the equation giving yearly sales S(x). 320) _____

A) S(x) = 16,200x + 6500
B) S(x) = 81,000x + 6500
C) S(x) = 81,000x + 87,500
D) S(x) = 16,200x + 87,500

321) The charges for renting a moving van are $65 for the first 20 miles and $5 for each additional mile. Assume that a fraction of a mile is rounded up. Find a symbolic representation for a function f that computes the cost of driving the van x miles, where $0 < x \le 100$. (Hint: express f as a piecewise-constant function.) Then, determine the cost of driving the van 94 miles. 321) _____

A) $f(x) = \begin{cases} 65 & \text{if } 0 < x \le 20 \\ 65 + 5(x - 20) & \text{if } 20 < x \le 100 \end{cases}$; $435

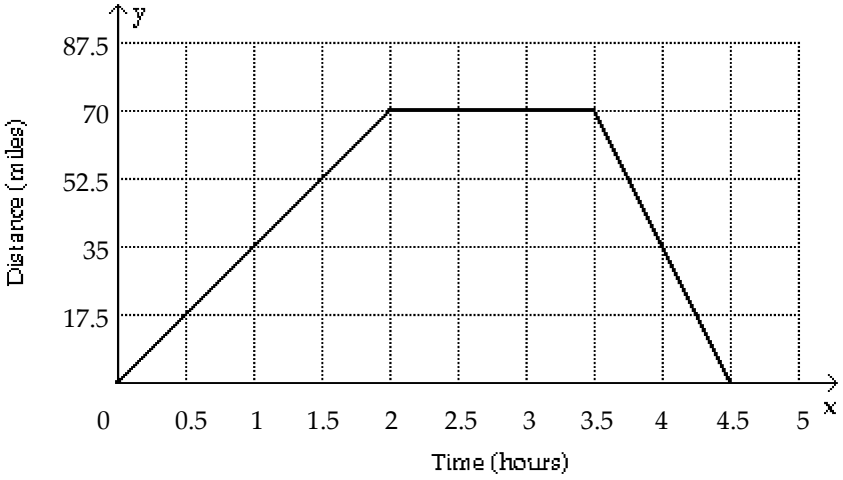
B) $f(x) = \begin{cases} 65x & \text{if } 0 < x \le 20 \\ 65x + 5(x - 20) & \text{if } 20 < x \le 100 \end{cases}$; $6480

C) $f(x) = \begin{cases} 65 & \text{if } 0 < x \le 20 \\ 65 + 5(x + 20) & \text{if } 20 < x \le 100 \end{cases}$; $635

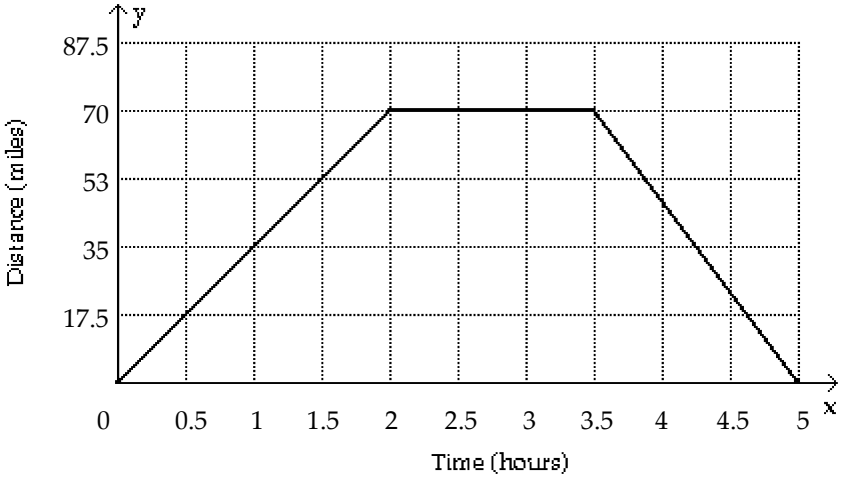
D) $f(x) = \begin{cases} 65 & \text{if } 0 < x \le 20 \\ 65 + 5(x - 20) & \text{if } 20 < x \le 100 \end{cases}$; $635

322) Sketch a graph showing the mileage that a person is from home after x hours if that individual drives at 35 mph to a lake 70 miles away, stays at the lake 1.5 hours, and then returns home at a speed of 70 mph. 322) _____

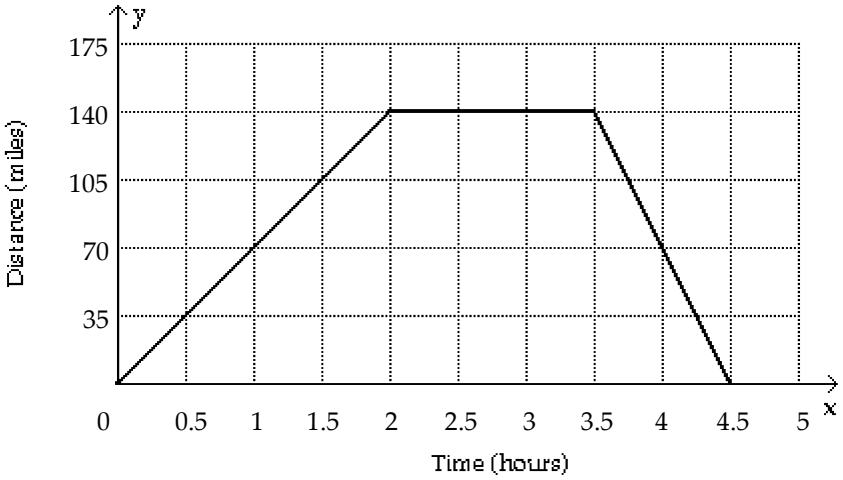
A)



B)



C)

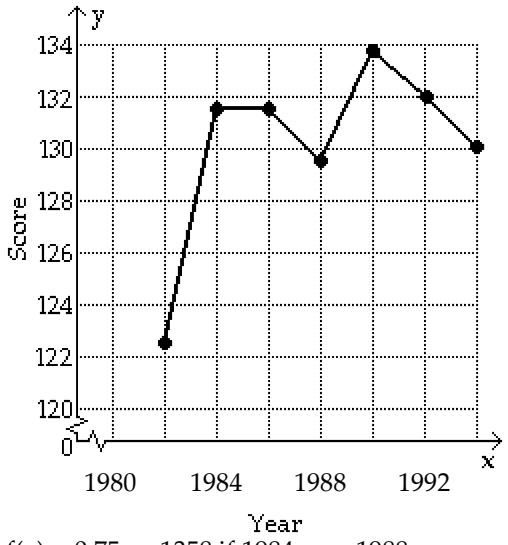


323) The table lists the average composite scores on a national entrance exam for selected years. 323) _____

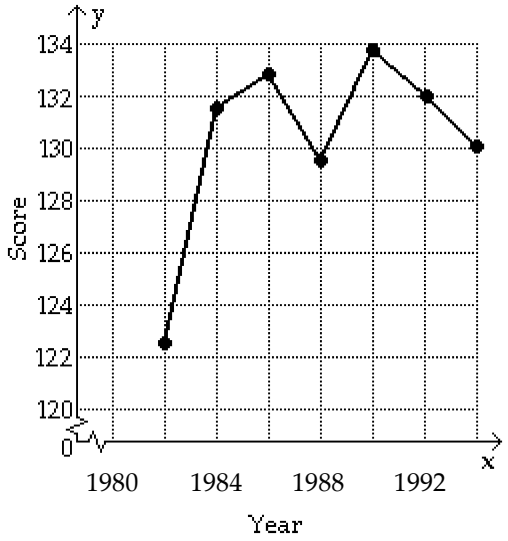
Year	1982	1984	1986	1988	1990	1992	1994
Score	122.7	131.5	131.5	129.5	133.9	132.0	130.0

Make a line graph of the data. If the graph represents a piecewise–linear function f, find a symbolic representation for the piece of f located on the interval [1984, 1986].

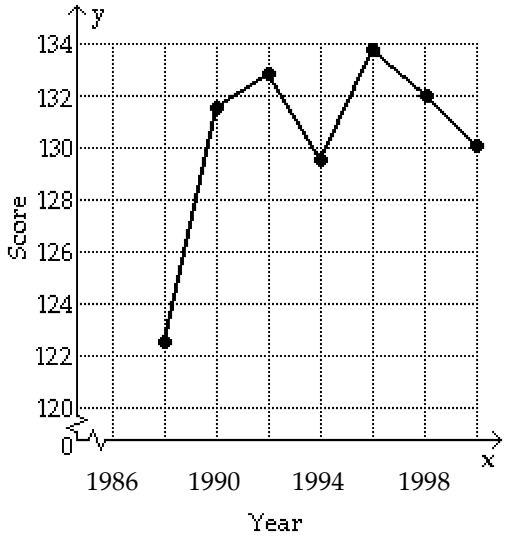
A) f(x) = 131.5 if 1984 ≤ x ≤ 1986



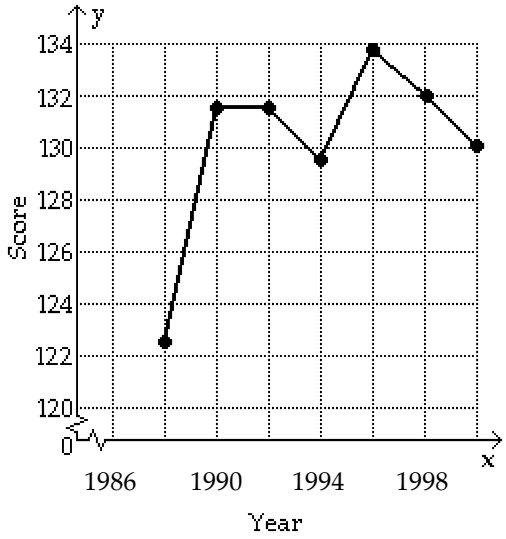
B) f(x) = 0.75x – 1358 if 1984 ≤ x ≤ 1988



C) f(x) = 122.7 if 1988 ≤ x ≤ 1990



D) f(x) = 4.4x – 8606.9 if 1988 ≤ x ≤ 1990



324) The table lists the average composite scores on a national entrance exam for selected years. 324) _____

Year	1978	1980	1982	1984	1986	1988	1990
Score	122.7	131.5	131.5	129.5	133.9	132.0	130.0

Evaluate f(1985).

A) 130.9 B) 131.7 C) 131.5 D) 130.5

325) In Country X, the average hourly wage in dollars from 1945 to 1995 can be modeled by 325) _____

$$f(x) = \begin{cases} 0.077(x - 1945) + 0.34 & \text{if } 1945 \le x < 1970 \\ 0.184(x - 1970) + 3.01 & \text{if } 1970 \le x \le 1995 \end{cases}$$

Use f to estimate the average hourly wages in 1950, 1970, and 1990.

A) $0.73, $2.27, $6.69 B) $0.73, $3.01, $6.69 C) $3.40, $0.34, $6.69

Describe the transformations that produce the graph of g from the graph of f.

326) $f(x) = |x|$; $g(x) = -3|x|$ 326) _____

A) Stretch vertically by a factor of 3. Reflect it across the x–axis.
B) Stretch horizontally by a factor of 3. Reflect it across the x–axis.
C) Stretch horizontally by a factor of 3. Reflect it across the y–axis.
D) Stretch vertically by a factor of 3. Reflect it across the y–axis.

327) $f(x) = \sqrt{x}$; $g(x) = -\sqrt{x + 7}$ 327) _____

A) Shift 7 units to the left. Reflect it across the x–axis.
B) Shift 7 units to the right. Reflect it across the x–axis.
C) Shift –7 units to the left. Reflect it across the x–axis.
D) Shift 7 units to the left. Reflect it across the y–axis.

328) $f(x) = x^2$; $g(x) = (x - 10)^2 - 7$ 328) _____

A) Shift 10 units to the left and 7 units upward.
B) Shift 7 units to the right and 10 units downward.
C) Shift 10 units to the right and 7 units downward.
D) Shift 10 units to the left and 7 units downward.

329) $f(x) = x^3$; $g(x) = -3x^3 + 2$ 329) _____

A) Stretch vertically by a factor of 3. Reflect it across the x–axis. Shift it 2 units upward.
B) Stretch vertically by a factor of 3. Reflect it across the y–axis. Shift it 2 units upward.
C) Stretch vertically by a factor of 2. Reflect it across the x–axis. Shift it 3 units upward.
D) Stretch vertically by a factor of 3. Reflect it across the x–axis. Shift it 2 units downward.

330) $f(x) = \frac{1}{x}$; $g(x) = \frac{10}{x} + 4$ 330) _____

A) Stretch vertically by a factor of $\frac{1}{10}$. Shift it 4 units up.
B) Shift it 10 units to the left and 4 units down.
C) Shift it 10 units to the right and 4 units up.
D) Stretch vertically by a factor of 10. Shift it 4 units up.

331) $f(x) = \frac{1}{x}$; $g(x) = \frac{1}{x + 11} - 12$ 331) _____

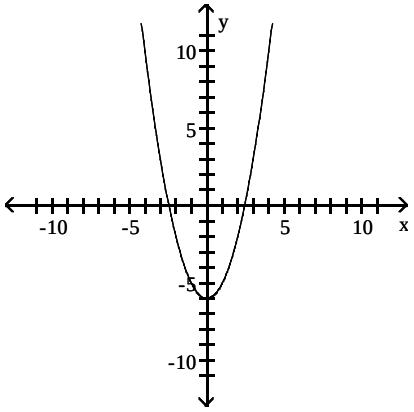
A) Shift it 11 units to the left and 12 units down.
B) Stretch horizontally by a factor of $\frac{1}{2}$. Shift it 12 units down.
C) Shift it 11 units to the left and 12 units up.
D) Stretch vertically by a factor of 12 and shift it 11 units to the right.

332) $f(x) = x^2$; $g(x) = -(x - 9)^2 + 8$ 332) _____

A) Shift it 9 units to the right. Reflect it across the x–axis. Shift it 8 units up.
B) Shift it 9 units to the left. Reflect it across the x–axis. Shift it 8 units up.
C) Shift it 9 units to the right. Reflect it across the y–axis. Shift it 8 units down.
D) Shift it 9 units to the right. Reflect it across the y–axis. Shift it 8 units up.

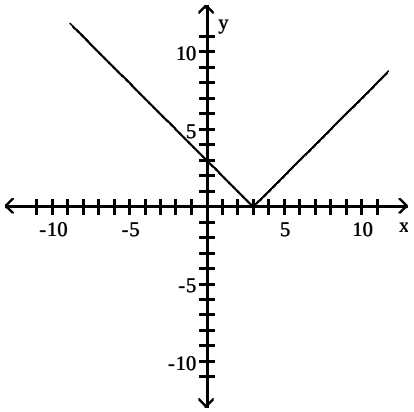
Match the graph with its corresponding function.

333) 333) _____



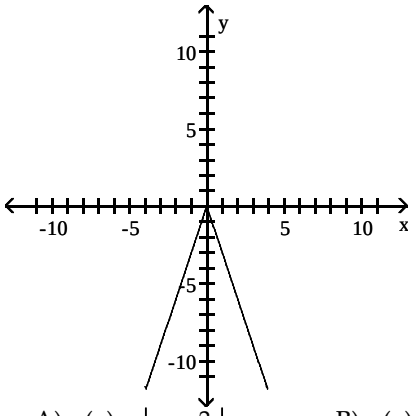
A) $g(x) = x^2 - 6$ B) $g(x) = (x - 6)^2$ C) $g(x) = 6x^2$ D) $g(x) = x^2 + 6$

334) 334) _____



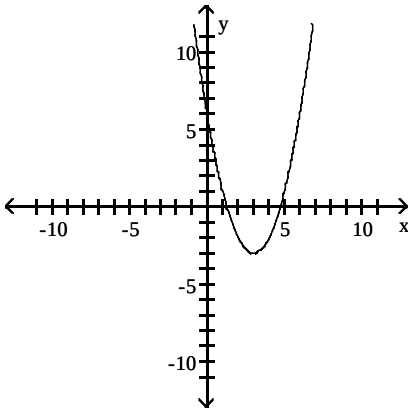
A) $g(x) = |x + 3|$ B) $g(x) = |x| - 3$ C) $g(x) = |x - 3|$ D) $g(x) = 3x^3$

335) 335) _____



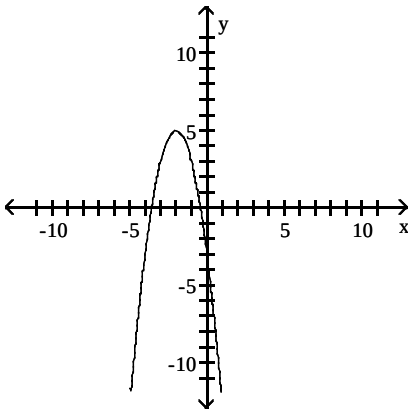
A) $g(x) = |x - 3|$ B) $g(x) = |x + 3|$ C) $g(x) = |x| - 3$ D) $g(x) = -3|x|$

336) 336) _____



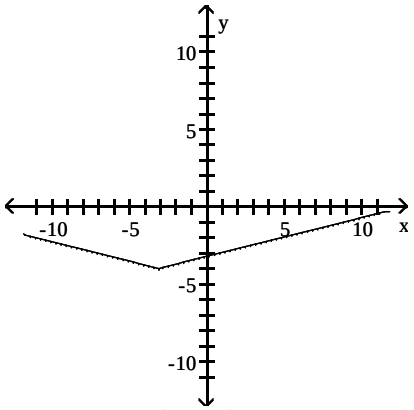
A) $g(x) = 6(x + 3)^2$
B) $g(x) = -6(x - 3)^2$
C) $g(x) = (x - 3)^2 - 3$
D) $g(x) = (x - 6)^2 - 3$

337) 337) _____



A) $g(x) = 2(x - 2)^2 - 5$
B) $g(x) = (x + 2)^2 + 5$
C) $g(x) = -2(x + 2)^2$
D) $g(x) = -2(x + 2)^2 + 5$

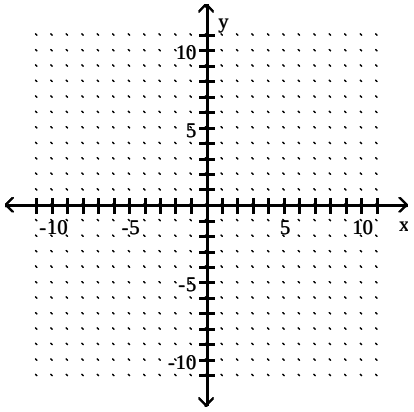
338) 338) _____



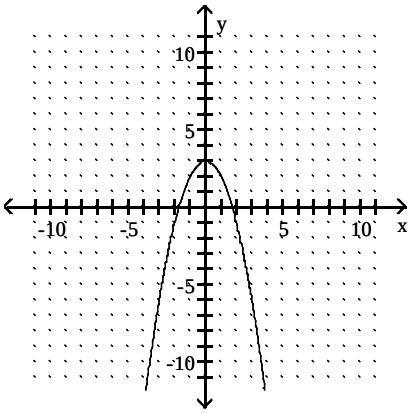
A) $g(x) = 4|x + 3| - 0.25$
B) $g(x) = 0.25|x - 3| + 4$
C) $g(x) = 4|x - 3| + 0.25$
D) $g(x) = 0.25|x + 3| - 4$

Graph the function by starting with a function from the library of functions and then using the techniques of shifting, compressing, stretching, and/or reflecting.

339) $g(x) = x^2 - 3$ 339) _____



A)



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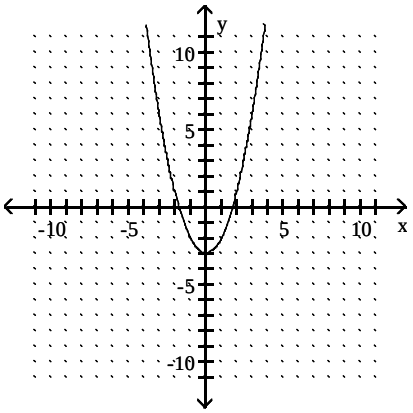

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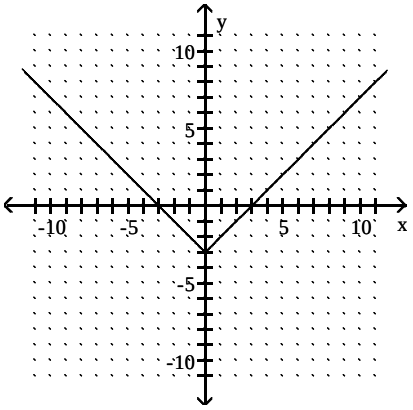

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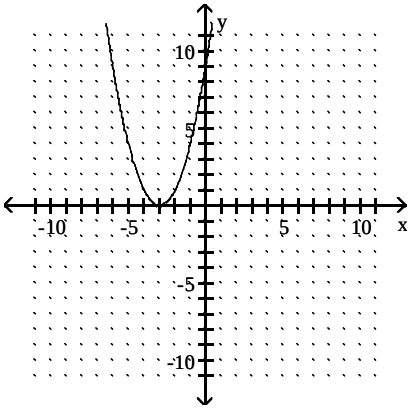
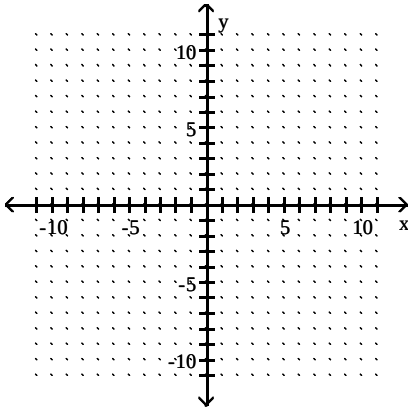
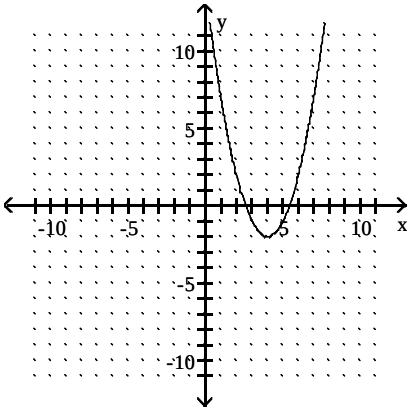


340) $g(x) = (x - 4)^2 - 2$ 340) _____



A)



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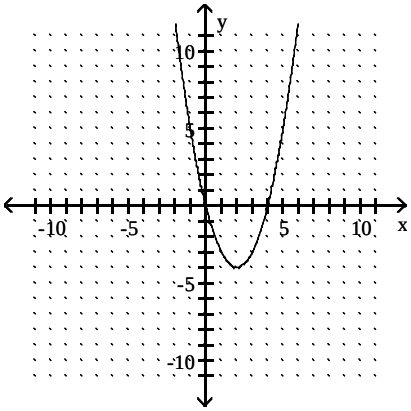

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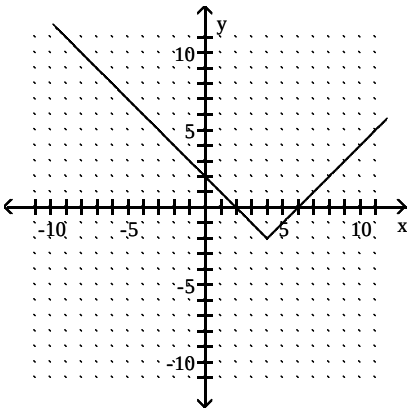

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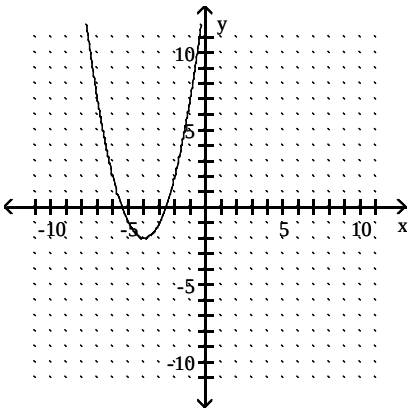
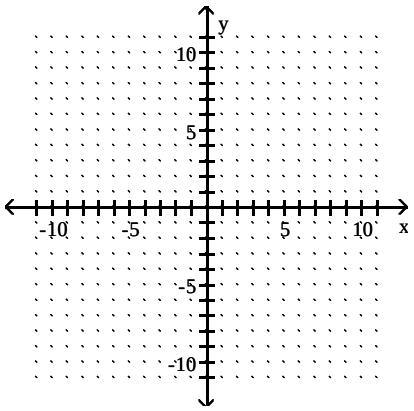
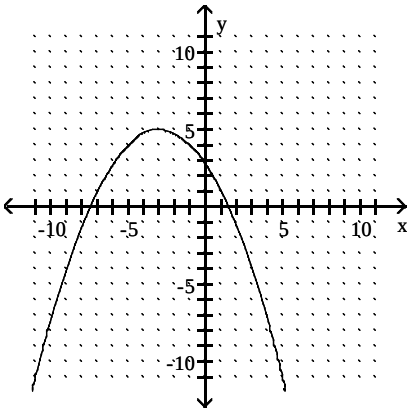


341) $g(x) = -4(x + 3)^2 + 5$ 341) _____



A)



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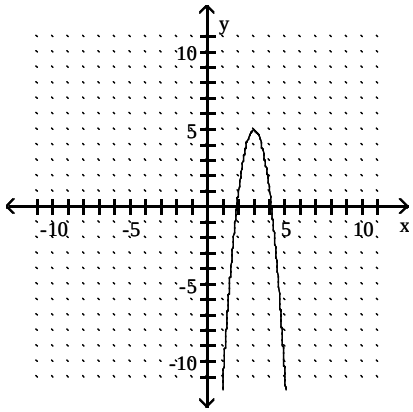

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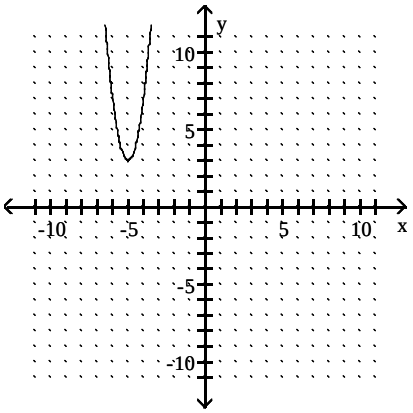
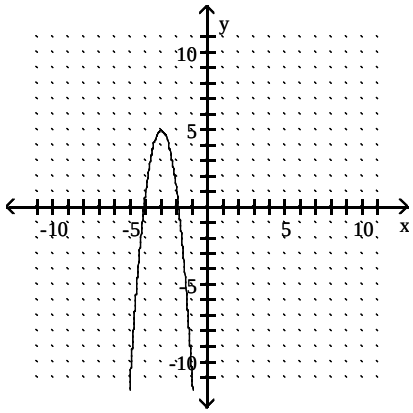
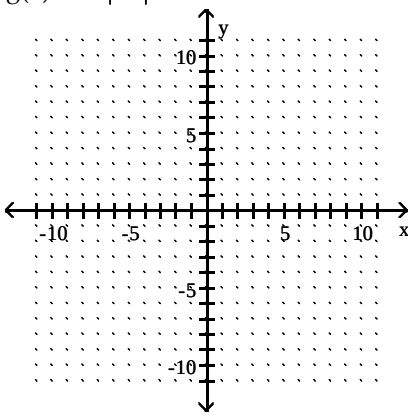


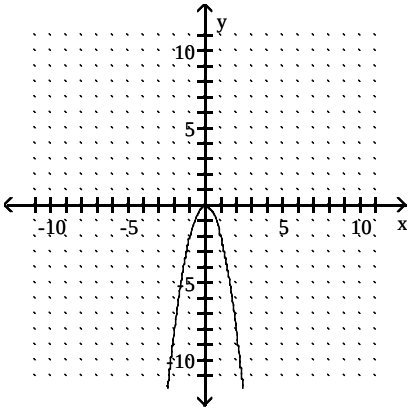
D)



342) $g(x) = -2|x|$ 342) _____



A)



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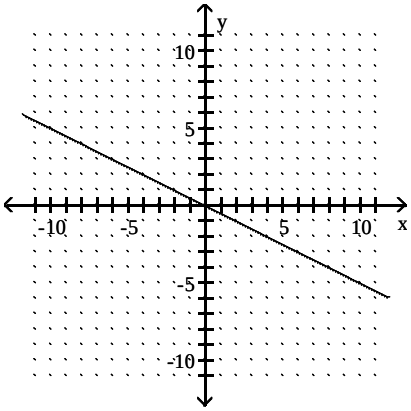
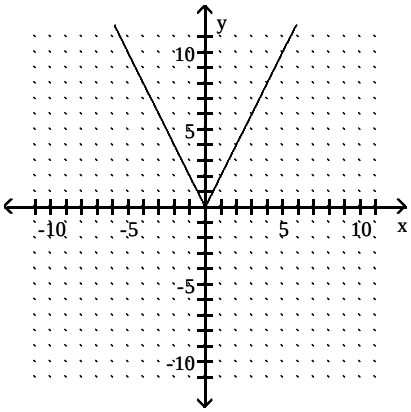
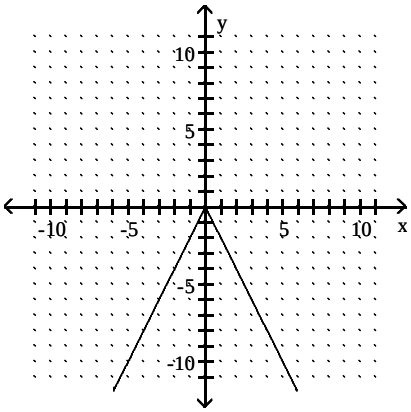


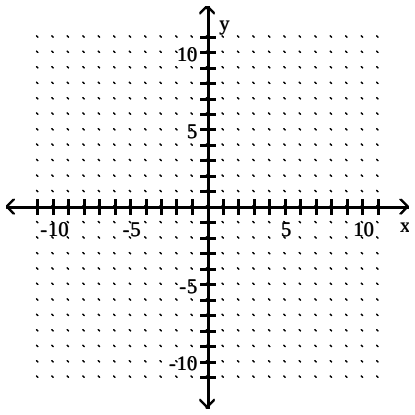
C)



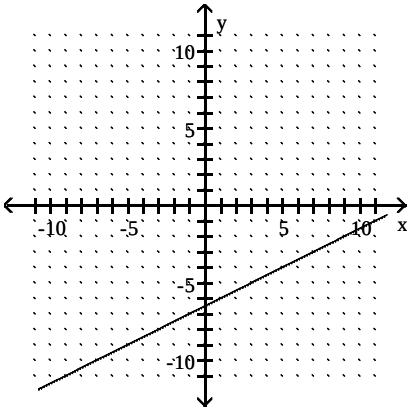
D)



343) $g(x) = \frac{1}{2}|x + 5| - 4$ 343) _____



A)



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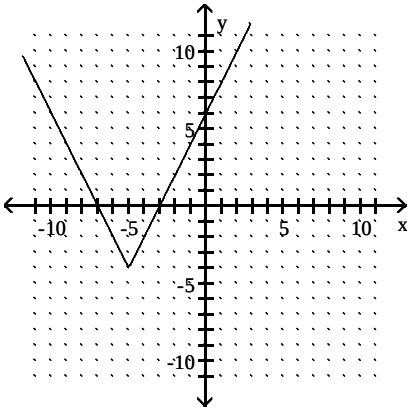
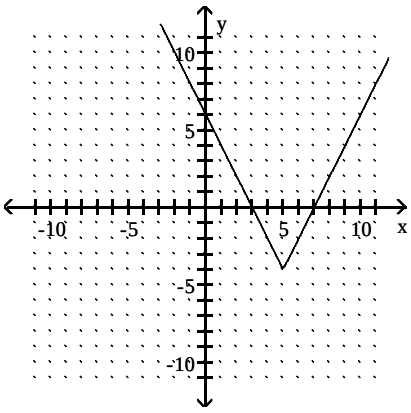


C)



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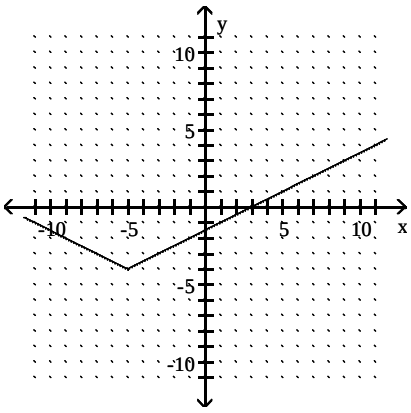
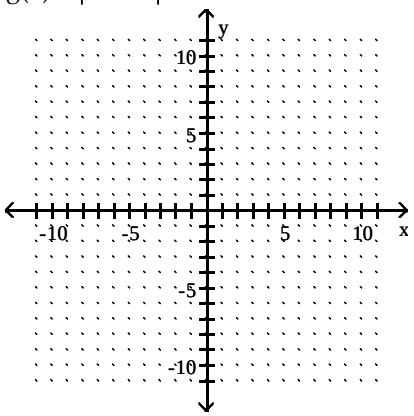
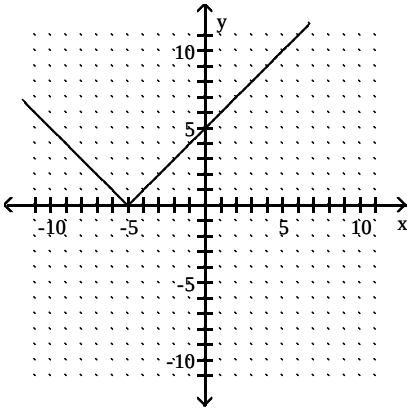


344) $g(x) = |x - 5|$ 344) _____



A)



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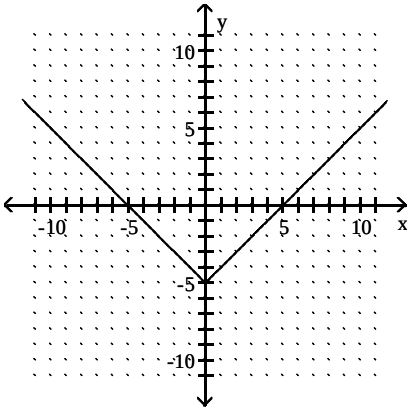
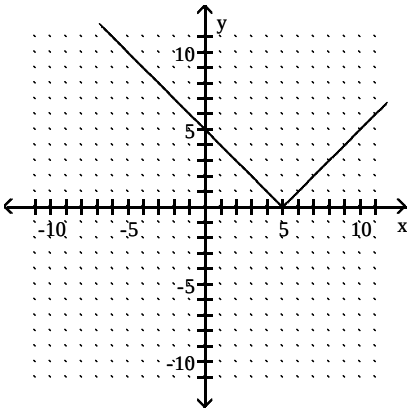
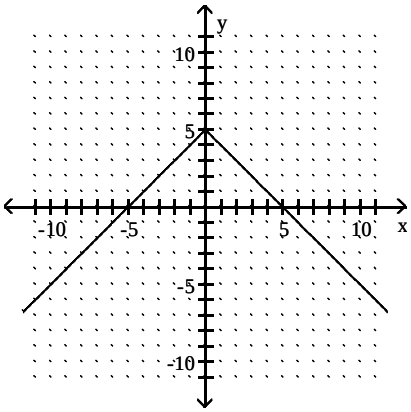


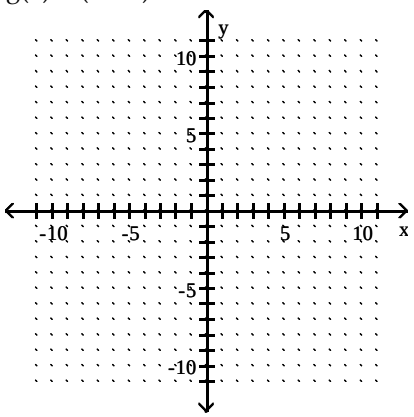
C)



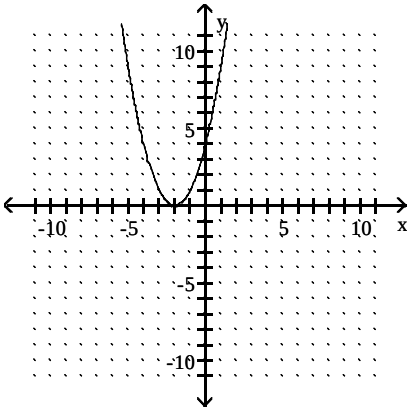
D)



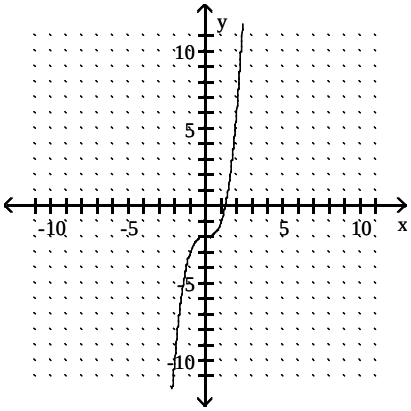
345) $g(x) = (x + 2)^3$ 345) _____



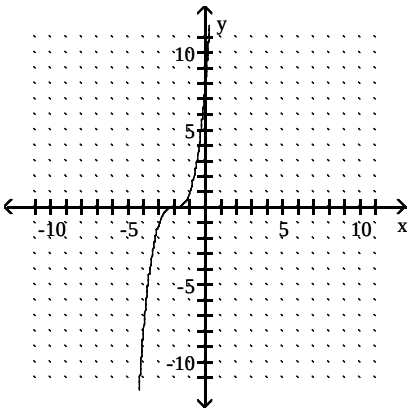
A)



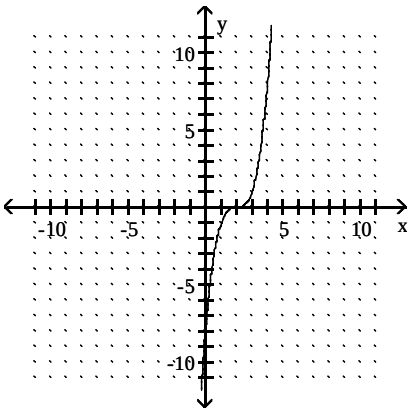
B)



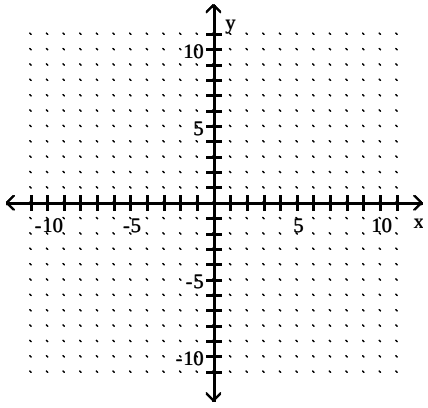
C)



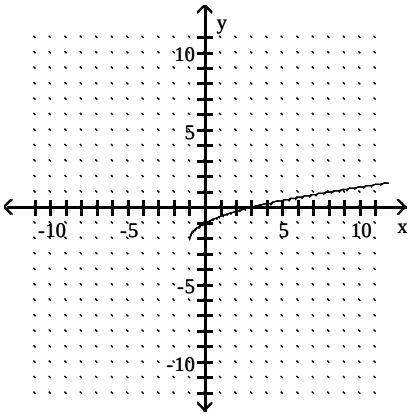
D)



346) $g(x) = -\sqrt{x+1} + 2$ 346) _____



A)



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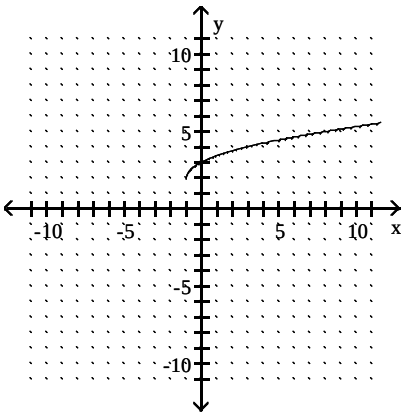

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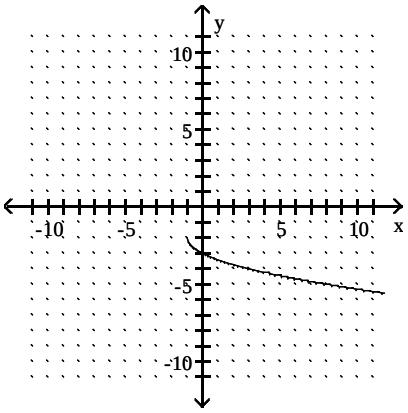
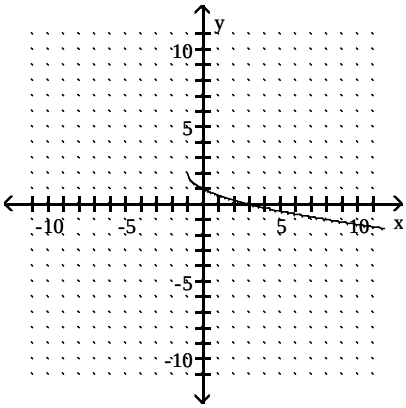


D)



Write an equation for a function whose graph fits the given description.

347) The graph of $f(x) = x^2$ is vertically stretched by a factor of 5, and the resulting graph is reflected across the x–axis. 347) _____

A) $f(x) = 5(x - 5)x^2$ B) $f(x) = -5x^2$ C) $f(x) = 5x^2$ D) $f(x) = (x - 5)^2$

348) The graph of $f(x) = x^2$ is shifted 4 units to the left and 8 units downward. 348) _____

A) $y = (x + 4)^2 - 8$ B) $y = (x + 8)^2 - 4$ C) $y = (x - 4)^2 - 8$ D) $y = (x - 8)^2 + 4$

349) The graph of $f(x) = x^2$ is shifted 3 units to the left. This graph is then vertically stretched by a factor of 6 and reflected across the x–axis. Finally, the graph is shifted 7 units downward. 349) _____

A) $y = -6(x + 3)^2 - 7$
B) $y = -6(x - 3)^2 + 7$
C) $y = -6(x + 7)^2 - 3$
D) $y = -6(x - 3)^2 - 7$

350) The graph of $f(x) = x^2$ is shifted 4 units to the left. This graph is then vertically shrunk by a factor of $\frac{1}{6}$ and reflected across the x–axis. Finally, the graph is shifted 7 units downward. 350) _____

A) $y = \frac{1}{6}(x - 4)^2 - 7$
B) $y = -\frac{1}{6}(x - 4)^2 - 7$
C) $y = -\frac{1}{6}(x - 4)^2 + 7$
D) $y = -\frac{1}{6}(x + 4)^2 - 7$

351) The graph of $f(x) = |x|$ is vertically stretched by a factor of 2, and the resulting graph is reflected across the x–axis. 351) _____

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

352) The graph of $f(x) = |x|$ is reflected across the y–axis. This graph is then vertically stretched by a factor of 6.7. Finally, the graph is shifted 4 units downward. 352) _____

A) $f(x) = 4|-x| - 6.7$
B) $f(x) = -6.7|x| - 4$
C) $f(x) = 6.7|-x| - 4$
D) $f(x) = 6.7|-x| + 4$

353) The graph of $f(x) = |x|$ is reflected across the y–axis and vertically shrunk by a factor of $\frac{1}{3}$. This graph is then reflected across the x–axis. Finally, the graph is shifted 2 units upward. 353) _____

A) $y = -\left|-x - \frac{1}{3}\right| + 2$
B) $y = \frac{1}{3}|x + 2|$
C) $y = -\frac{1}{3}|-x| + 2$
D) $y = \frac{1}{3}|x| + 2$

354) The graph of $f(x) = \sqrt{x}$ is shifted 5 units to the right. 354) _____

A) $y = \sqrt{x} + 5$
B) $y = \sqrt{x + 5}$
C) $y = \sqrt{x - 5}$
D) $y = \sqrt{x} - 5$

355) The graph of $f(x) = \sqrt{x}$ is shifted 8 units to the left and then shifted 9 units upward. 355) _____

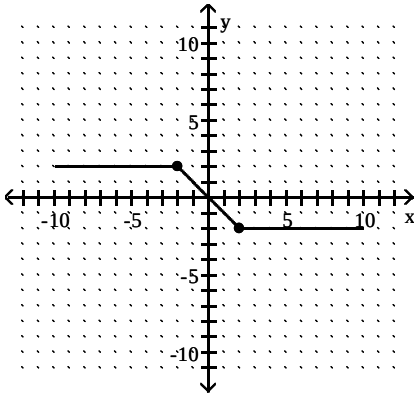
A) $f(x) = 9\sqrt{x + 8}$
B) $f(x) = \sqrt{x - 8} + 9$
C) $f(x) = \sqrt{x + 8} + 9$
D) $f(x) = \sqrt{x + 9} + 8$

356) The graph of $f(x) = x^4$ shifted right 4 units and up 9 units. 356) _____

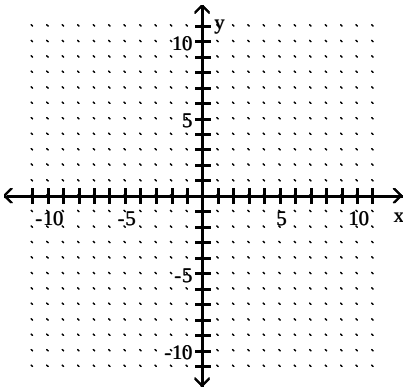
A) $y = (x + 4)^4 - 9$
B) $y = (x - 4)^4 + 9$
C) $y = -(x - 4)^4 + 36$
D) $y = -(x - 4)^4 + 9$

Graph the function y = g(x), given the graph of y = f(x).

357) g(x) = 2f(x) 357) _____



A)



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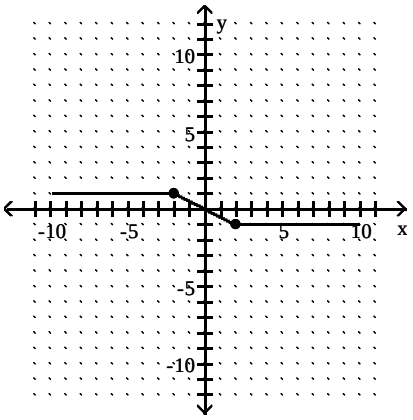

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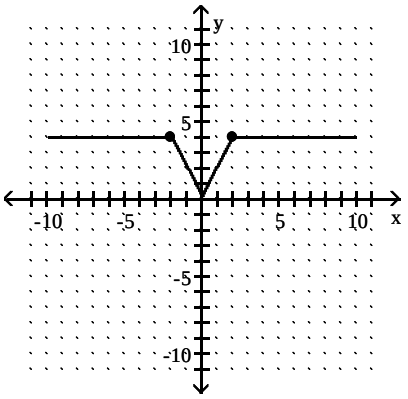
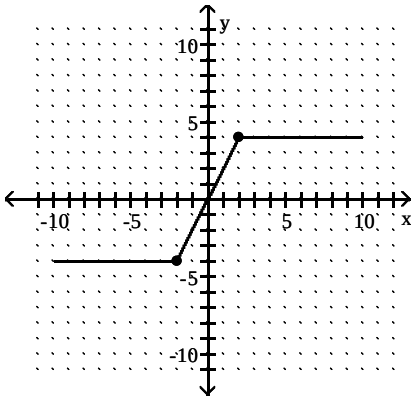
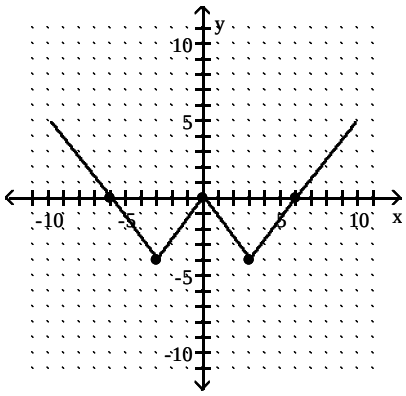


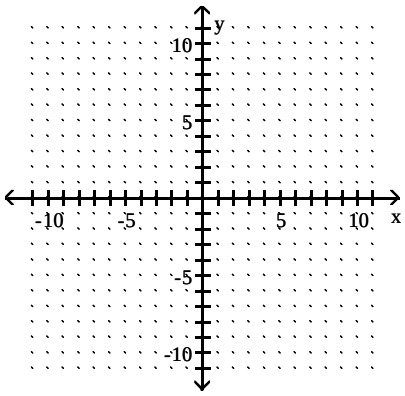
D)



358) $g(x) = -\frac{1}{2}f(x)$ 358) _____



A)



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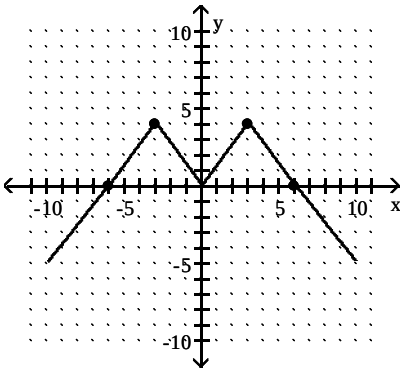

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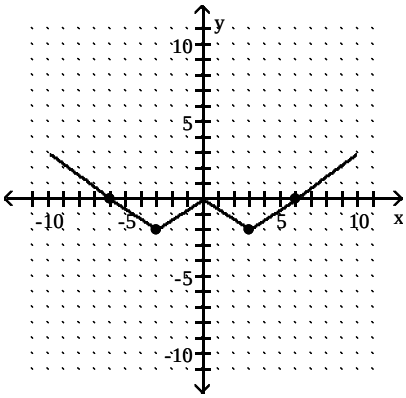

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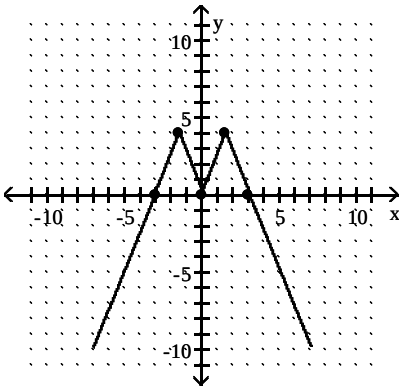
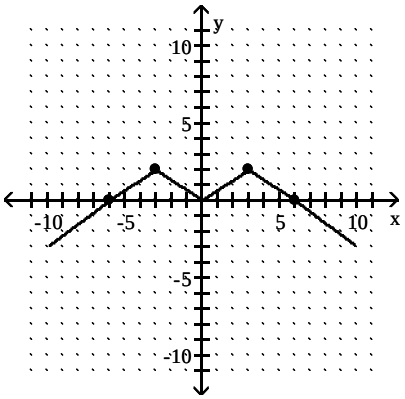
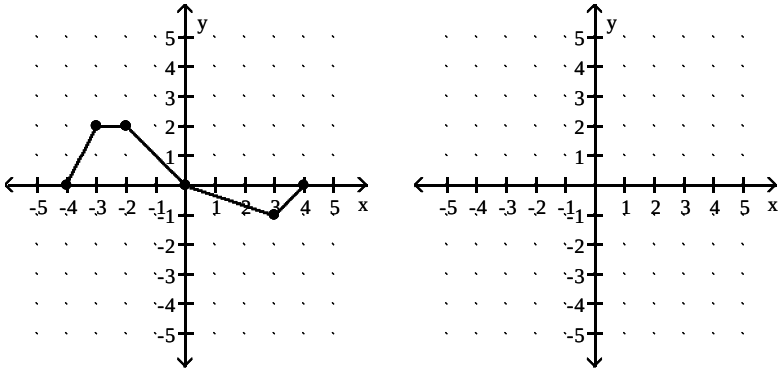
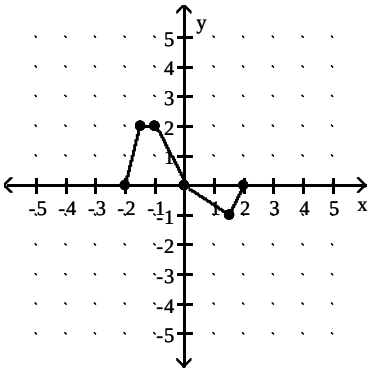




359) g(x) = f(2x) 359) _____



A)



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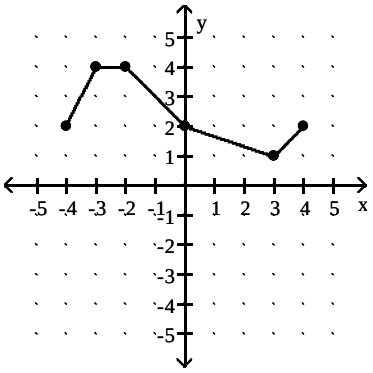

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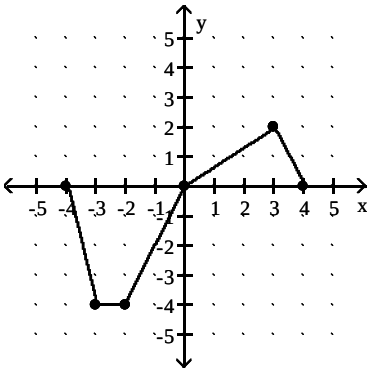

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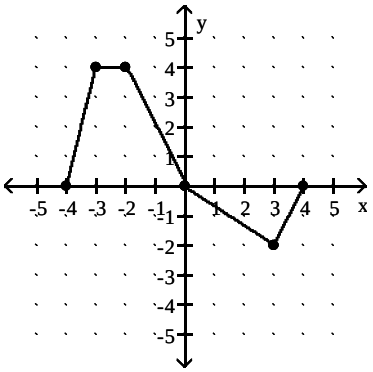
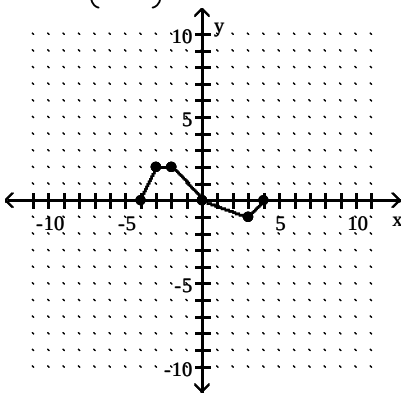
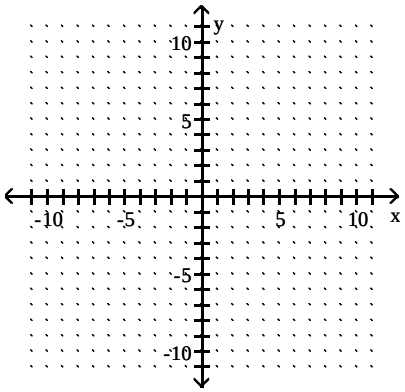


360) $g(x) = f\left(-\frac{1}{2}x\right)$ 360) _____



A)



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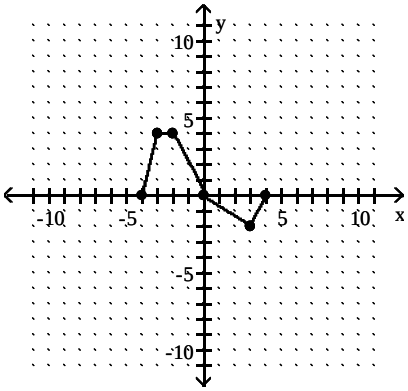
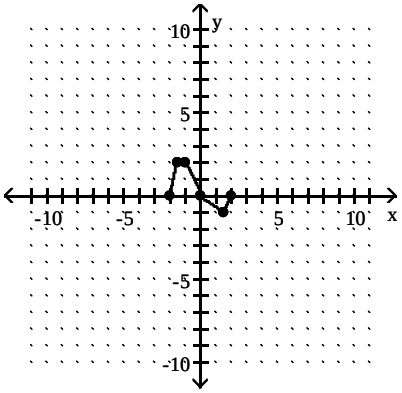
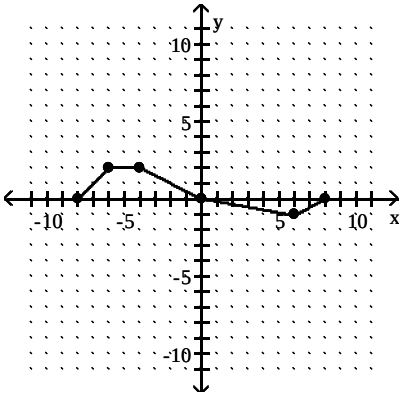
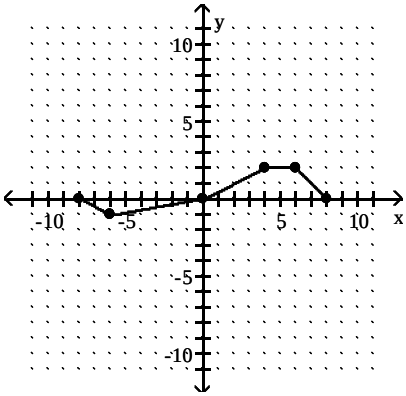


C)

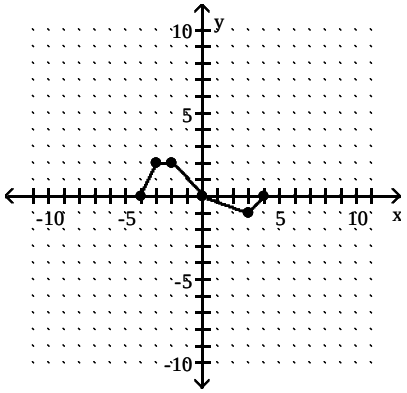


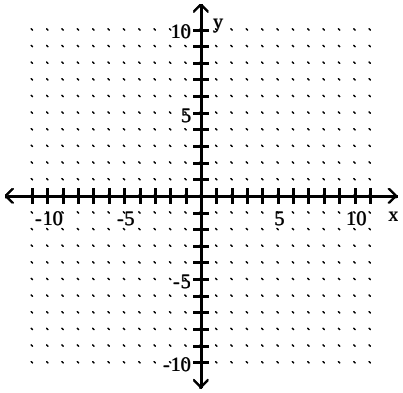
D)



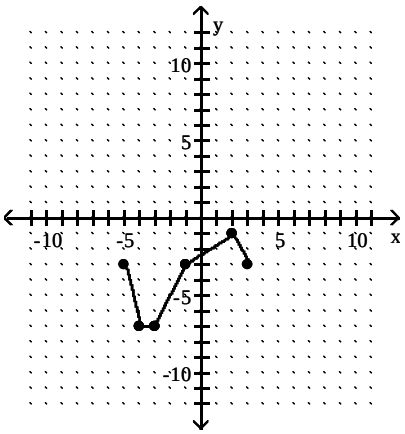


361) $g(x) = -2f(x + 1) - 3$ 361) _____





A)



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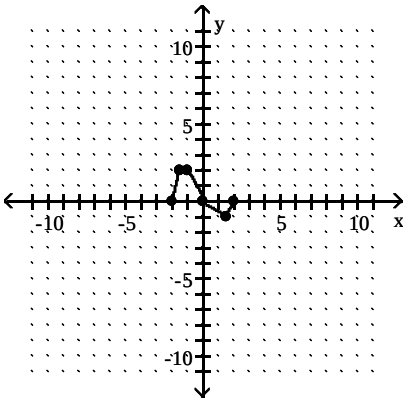

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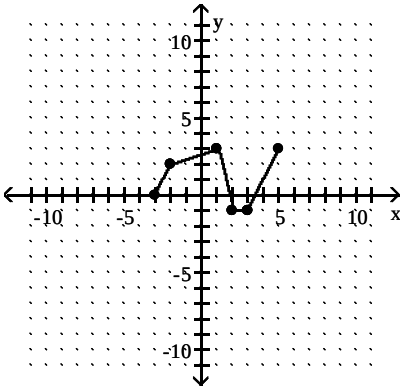
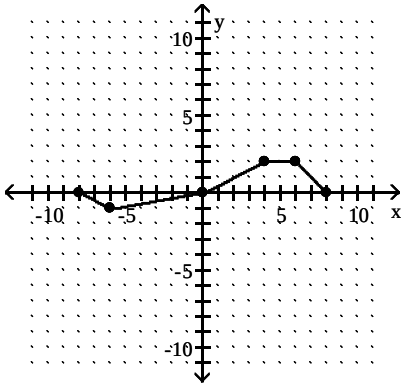
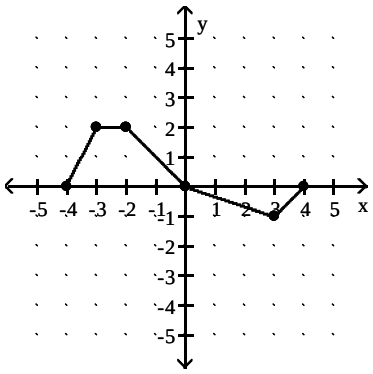


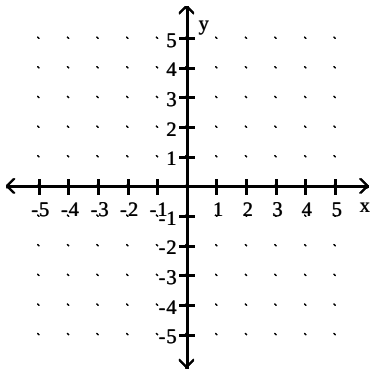
D)



362) $g(x) = \frac{1}{2}f(x - 1) + 3$ 362) _____



A)



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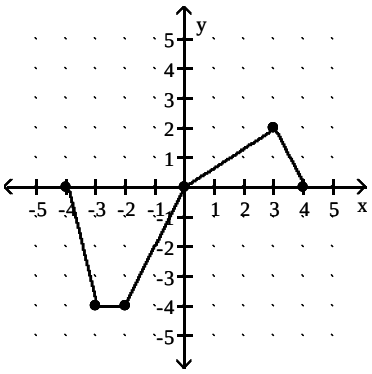
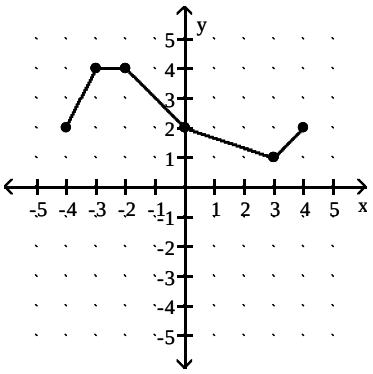
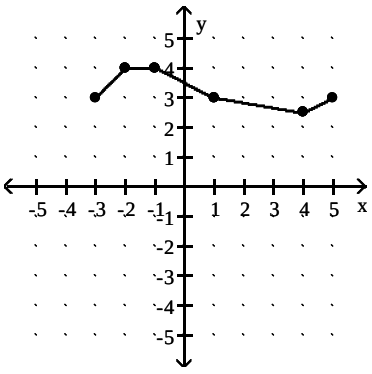
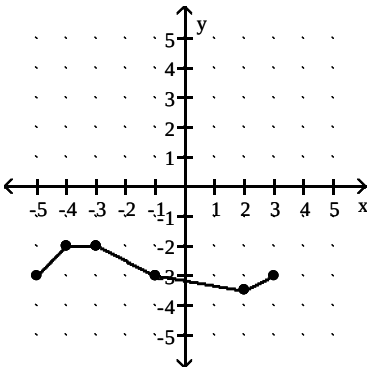


C)



D)





Write the new function.

363) The linear function f(x) = 241x + 6320 provides an approximation of the annual cost (in dollars) to rent an apartment at the Leisure Village Retirement Community, where x = 1 represents 1978, x = 2 represents 1979, and so on. Write a new function, g(x), that yields the same f(x)–values when the exact year number is entered. 363) _____

A) g(x) = 241(x – 1978) + 6320
B) g(x) = 241(x – 1977) + 6320
C) g(x) = 241(1977 – x) + 6320
D) g(x) = 241(1978 – x) + 6320

364) The linear function f(x) = 72.66x + 1038 provides an approximation of the value (in dollars) of an account opened on January 1, 1988, in the amount of $1038 and earning 7% simple interest, where x = 0 represents January 1, 1988, x = 1 represents January 1, 1989, x = 2 represents January 1, 1990, and so on. Write a new function, g(x), that yields the same f(x)–values when the exact year number is entered. 364) _____

A) g(x) = 72.66(1989 – x) + 1038
B) g(x) = 72.66(x – 1988) + 1038
C) g(x) = 72.66(1988 – x) + 1038
D) g(x) = 72.66(x – 1989) + 1038

365) The linear function f(x) = 473x + 3420 provides an approximation of the annual cost (in dollars) of health insurance for a family of three, where x = 1 represents 1993, x = 2 represents 1994, and so on. Write a new function, g(x), that yields the same f(x)–values when the exact year number is entered. 365) _____

A) g(x) = 473(1992 – x) + 3420
B) g(x) = 473(1993 – x) + 3420
C) g(x) = 473(x – 1993) + 3420
D) g(x) = 473(x – 1992) + 3420

Find the given value.

366) Find (f + g)(5) when f(x) = x – 5 and g(x) = x – 3. 366) _____

A) 18 B) 8 C) 2 D) 12

367) Find (f + g)(6) when $f(x) = \frac{9}{\sqrt{x+3}}$ and g(x) = 4x + 1. 367) _____

A) 4 B) 37 C) 27 D) 28

368) Find (f – g)(–4) when $f(x) = -2x^2 - 3$ and g(x) = x + 7. 368) _____

A) –46 B) 39 C) –24 D) –38

369) Find (f – g)(–3) when $f(x) = x + 3$ and $g(x) = \sqrt{x-2}$ 369) _____

A) $\sqrt{5}$ B) 0 C) $\sqrt{2}$ D) Does not exist

370) Find (f · g)(4) when f(x) = x – 2 and $g(x) = -4x^2 + 12x - 4$. 370) _____

A) –120 B) –40 C) –408 D) 120

371) Find (f · g)(2) when $f(x) = \frac{x}{x^2 + 4x + 4}$ and g(x) = x + 9. 371) _____

A) $\frac{11}{8}$ B) $\frac{11}{4}$ C) $\frac{5}{4}$ D) $\frac{5}{2}$

372) Find $\left(\frac{f}{g}\right)(-3)$ when f(x) = 3x – 5 and $g(x) = 2x^2 + 14x + 2$. 372) _____

A) $-\frac{3}{22}$ B) $-\frac{1}{11}$ C) $\frac{7}{11}$ D) $\frac{1}{2}$

373) Find $\left(\frac{f}{g}\right)\left(-\frac{1}{4}\right)$ when $f(x) = x^2 - 2$ and g(x) = 4x + 1 373) _____

A) $\frac{1}{2}$ B) $-\frac{2}{3}$ C) 0 D) Does not exist

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

374) $f(x) = 2 - 6x;\ g(x) = -8x + 6$ 374) _____

Find $f + g$.

A) $(f + g)(x) = -8x + 2; \left(-\infty, \frac{1}{4}\right) \cup \left(\frac{1}{4}, \infty\right)$

B) $(f + g)(x) = 2x + 8; (-\infty, 4) \cup (4, \infty)$

C) $(f + g)(x) = -6x; (-\infty, \infty)$

D) $(f + g)(x) = -14x + 8; (-\infty, \infty)$

375) $f(x) = 2x - 4;\ g(x) = 9x - 9$ 375) _____

Find $f - g$.

A) $(f - g)(x) = 11x - 13; (-\infty, 1) \cup (1, \infty)$

B) $(f - g)(x) = -7x + 5; (-\infty, \infty)$

C) $(f - g)(x) = -7x - 13; \left(-\infty, -\frac{13}{7}\right) \cup \left(-\frac{13}{7}, \infty\right)$

D) $(f - g)(x) = 7x - 5; (-\infty, \infty)$

376) $f(x) = 4x - 8;\ g(x) = 8x + 6$ 376) _____

Find $f \cdot g$.

A) $(f \cdot g)(x) = 32x^2 - 48; (-\infty, -48) \cup (-48, \infty)$

B) $(f \cdot g)(x) = 12x^2 - 40x - 2; (-\infty, \infty)$

C) $(f \cdot g)(x) = 32x^2 - 40x - 48; (-\infty, \infty)$

D) $(f \cdot g)(x) = 32x^2 - 58x - 48; (-\infty, -48) \cup (-48, \infty)$

377) $f(x) = 3x + 4;\ g(x) = 6x - 1$ 377) _____

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

A) $\left(\frac{f}{g}\right)(x) = \frac{3x + 4}{6x - 1}; \left(-\infty, \frac{1}{6}\right) \cup \left(\frac{1}{6}, \infty\right)$

B) $\left(\frac{f}{g}\right)(x) = \frac{6x - 1}{3x + 4}; \left(-\infty, -\frac{4}{3}\right) \cup \left(-\frac{4}{3}, \infty\right)$

C) $\left(\frac{f}{g}\right)(x) = \frac{6x - 1}{3x + 4}; \left(-\infty, \frac{1}{6}\right) \cup \left(\frac{1}{6}, \infty\right)$

D) $\left(\frac{f}{g}\right)(x) = \frac{3x + 4}{6x - 1}; \left(-\infty, -\frac{4}{3}\right) \cup \left(-\frac{4}{3}, \infty\right)$

378) $f(x) = 16 - x^2;\ g(x) = 4 - x$ 378) _____

Find $f + g$.

A) $(f + g)(x) = -x^2 + x + 12; (-\infty, \infty)$

B) $(f + g)(x) = x^3 - 4x^2 - 16x + 64; (-\infty, \infty)$

C) $(f + g)(x) = 4 + x; (-\infty, -4) \cup (-4, \infty)$

D) $(f + g)(x) = -x^2 - x + 20; (-\infty, \infty)$

379) $f(x) = x - 6;\ g(x) = 9x^2$ 379) _____

Find $f - g$.

A) $(f - g)(x) = -9x^2 + x - 6; (-\infty, 6) \cup (6, \infty)$

B) $(f - g)(x) = 9x^2 + x - 6; (-\infty, \infty)$

C) $(f - g)(x) = -9x^2 + x - 6; (-\infty, \infty)$

D) $(f - g)(x) = 9x^2 - x + 6; (-\infty, \infty)$

380) $f(x) = 2x^3 + 3;\ g(x) = 6x^2 - 1$ 380) _____

Find $f \cdot g$.

A) $(f \cdot g)(x) = 12x^6 - 2x^3 + 18x^2 - 3; (-\infty, \infty)$

B) $(f \cdot g)(x) = 12x^5 - 2x^3 + 18x^2 - 3; (-\infty, \infty)$

C) $(f \cdot g)(x) = 2x^3 + 6x^2 - 3; (-\infty, \infty)$

D) $(f \cdot g)(x) = 12x^5 - 2x^3 + 18x^2 - 3; (-\infty, 0) \cup (0, \infty)$

381) $f(x) = \sqrt{x}$; $g(x) = 4x - 1$ 381) _____

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

A) $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{x}}{4x - 1}; \left[0, \frac{1}{4}\right) \cup \left(\frac{1}{4}, \infty\right)$

B) $\left(\frac{f}{g}\right)(x) = \frac{4x - 1}{\sqrt{x}}; [0, \infty)$

C) $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{x}}{4x - 1}; \left(-\infty, \frac{1}{4}\right) \cup \left(\frac{1}{4}, \infty\right)$

D) $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{x}}{4x - 1}; (-\infty, 0) \cup (0, \infty)$

382) $f(x) = \frac{3x + 4}{7x - 4}$; $g(x) = \frac{9x}{7x - 4}$ 382) _____

Find f + g.

A) $(f + g)(x) = \frac{12x + 4}{7x - 4}; \left(-\infty, -\frac{1}{3}\right) \cup \left(-\frac{1}{3}, \infty\right)$

B) $(f + g)(x) = \frac{12x + 4}{7x - 4}; (-\infty, 0) \cup (0, \infty)$

C) $(f + g)(x) = \frac{-6x - 4}{7x - 4}; \left(-\infty, \frac{4}{7}\right) \cup \left(\frac{4}{7}, \infty\right)$

D) $(f + g)(x) = \frac{12x + 4}{7x - 4}; \left(-\infty, \frac{4}{7}\right) \cup \left(\frac{4}{7}, \infty\right) \{x \mid x \neq \frac{4}{7}\}$

383) $f(x) = \sqrt{x + 13}$; $g(x) = \frac{2}{x}$ 383) _____

Find f · g.

A) $(f \cdot g)(x) = \frac{\sqrt{2x + 26}}{x}; [-13, 0) \cup (0, \infty)$

B) $(f \cdot g)(x) = \sqrt{\frac{2x + 26}{x}}; [0, 13) \cup (13, \infty)$

C) $(f \cdot g)(x) = \sqrt{\frac{15}{x}}; (-\infty, 0) \cup (0, \infty)$

D) $(f \cdot g)(x) = \frac{2\sqrt{x + 13}}{x}; [-13, 0) \cup (0, \infty)$

Evaluate the expression.

384) $(g \circ f)(4)$ when $f(x) = \frac{x - 6}{2}$ and $g(x) = 3x + 1$. 384) _____

A) $\frac{7}{2}$ B) −13 C) −4 D) −2

385) $(f \circ g)(-9)$ when $f(x) = -6x + 3$ and $g(x) = -7x^2 - 4x - 5$. 385) _____

A) −22,976 B) −632 C) 3219 D) −561

386) $(g \circ f)(2)$ when $f(x) = 6x - 5$ and $g(x) = -6x^2 - 7x - 2$. 386) _____

A) −173 B) −93 C) −345 D) −245

387) $(f \circ g)(a)$ when $f(x) = 6x + 7$ and $g(x) = 4x - 1$. 387) _____

A) 24a + 27 B) 24a + 1 C) 24a + 6 D) 24a + 13

388) $(g \circ f)(c)$ when $f(x) = -6x + 8$ and $g(x) = 2x + 5$. 388) _____

A) −12c − 11 B) −12c + 21 C) 12c + 21 D) −12c + 38

389) $(f \circ f)(6)$ when $f(x) = 3x + 4$ and $g(x) = 2x^2 + 3$ 389) _____

A) 70 B) 38 C) 22 D) 34

390) $(g \circ g)(9)$ when $f(x) = 4x - 4$ and $g(x) = 2x^2 - 4$ 390) _____

A) 312 B) 55,116 C) 24,960 D) 49,924

Find the composite function for the given functions.

391) $f \circ g$ for $f(x) = 3x + 14$ and $g(x) = 5x - 1$ 391) _____

A) $15x + 13$ B) $15x + 17$ C) $15x + 69$ D) $15x + 11$

392) $f \circ g$ for $f(x) = 4x + 5$ and $g(x) = -2x + 4$ 392) _____

A) $8x + 21$ B) $-8x$ C) $-8x + 14$ D) $-8x + 21$

393) $f \circ g$ for $f(x) = 4x + 5$ and $g(x) = x^2 - 9$ 393) _____

A) $16x^2 + 8x - 5$ B) $x^2 - 4x - 14$ C) $4x^2 - 31$ D) $x^2 + 4x - 4$

394) $f \circ g$ for $f(x) = \frac{9}{4}x$ and $g(x) = -\frac{4}{9}x$ 394) _____

A) 1 B) x C) $-x$ D) 0

395) $f \circ g$ for $f(x) = \frac{2}{x - 7}$ and $g(x) = \frac{8}{3x}$ 395) _____

A) $\frac{6x}{8 - 21x}$ B) $\frac{8x - 56}{6x}$ C) $\frac{2x}{8 - 21x}$ D) $\frac{6x}{8 + 21x}$

396) $g \circ f$ for $f(x) = \frac{x - 3}{2}$ and $g(x) = 2x + 3$ 396) _____

A) x B) $x + 6$ C) $2x + 3$ D) $x - \frac{3}{2}$

397) $f \circ g$ for $f(x) = \sqrt{x + 8}$ and $g(x) = 8x - 12$ 397) _____

A) $8\sqrt{x - 4}$ B) $2\sqrt{2x - 1}$ C) $8\sqrt{x + 8} - 12$ D) $2\sqrt{2x + 1}$

398) $g \circ f$ for $f(x) = 4x^2 + 2x + 4$ and $g(x) = 2x - 8$ 398) _____

A) $4x^2 + 4x + 0$ B) $8x^2 + 4x + 0$ C) $4x^2 + 2x - 4$ D) $8x^2 + 4x + 16$

399) $g \circ f$ for $f(x) = \frac{7}{x}$ and $g(x) = 6x^3$ 399) _____

A) $\frac{7}{6x^3}$ B) $\frac{6x^3}{7}$ C) $\frac{6x^3}{343}$ D) $\frac{2058}{x^3}$

400) $g \circ f$ for $f(x) = x^3 + 6$ and $g(x) = \sqrt[3]{x - 6}$ 400) _____

A) x^3 B) x C) $-x$ D) $|x|$

Find the domain of the composite function f∘g.

401) $f(x) = x^2 - 25,\ g(x) = 2x + 3$ 401) _____

A) $[5, \infty)$ B) $(-5, 5)$ C) $(-\infty, \infty)$ D) $[0, \infty)$

402) $f(x) = \frac{1}{x - 9},\ g(x) = \sqrt{x + 1}$ 402) _____

A) $[-1, 9) \cup (9, \infty)$ B) $[-1, 80) \cup (80, \infty)$ C) $[0, 80) \cup (80, \infty)$ D) $[0, 9) \cup (9, \infty)$

403) $f(x) = 4x + 16,\ g(x) = x + 2$ 403) _____

A) $(-\infty, -4) \cup (-4, -2) \cup (-2, \infty)$ B) $(-\infty, 6) \cup (6, \infty)$

C) $(-\infty, -6) \cup (-6, \infty)$ D) $(-\infty, \infty)$

404) $f(x) = \frac{2}{x + 10},\ g(x) = x + 6$ 404) _____

A) $(-\infty, \infty)$ B) $(-\infty, -16) \cup (-16, \infty)$

C) $(-\infty, -10) \cup (-10, \infty)$ D) $(-\infty, -10) \cup (-10, -6) \cup (-6, \infty)$

405) $f(x) = x + 2,\ g(x) = \frac{7}{x + 6}$ 405) _____

A) $(-\infty, \infty)$ B) $(-\infty, -6) \cup (-6, -2) \cup (-2, \infty)$

C) $(-\infty, -6) \cup (-6, \infty)$ D) $(-\infty, -8) \cup (-8, \infty)$

406) $f(x) = \frac{4}{x + 5},\ g(x) = \frac{5}{x}$ 406) _____

A) $(-\infty, -5) \cup (-5, -1) \cup (-1, 0) \cup (0, \infty)$ B) $(-\infty, 0) \cup (0, -1) \cup (-1, \infty)$

C) $(-\infty, -5) \cup (-5, 0) \cup (0, \infty)$ D) $(-\infty, \infty)$

407) $f(x) = \sqrt{x},\ g(x) = 4x + 16$ 407) _____

A) $[0, \infty)$ B) $(-\infty, \infty)$ C) $[-4, \infty)$ D) $(-\infty, -4] \cup [0, \infty)$

408) $f(x) = 3x + 9,\ g(x) = \sqrt{x}$ 408) _____

A) $(-\infty, -3] \cup [0, \infty)$ B) $[-3, \infty)$ C) $(-\infty, \infty)$ D) $[0, \infty)$

Express the given function H as a composition of two functions f and g such that H(x) = (f ∘ g)(x).

409) $H(x) = \frac{1}{x^2 - 4}$ 409) _____

A) $f(x) = \frac{1}{x^2}, g(x) = x - 4$ B) $f(x) = \frac{1}{x^2}, g(x) = -\frac{1}{4}$

C) $f(x) = \frac{1}{4}, g(x) = x^2 - 4$ D) $f(x) = \frac{1}{x}, g(x) = x^2 - 4$

410) $H(x) = |8x + 1|$ 410) _____

A) $f(x) = |x|, g(x) = 8x + 1$ B) $f(x) = |-x|, g(x) = 8x - 1$

C) $f(x) = -|x|, g(x) = 8x + 1$ D) $f(x) = x, g(x) = 8x + 1$

411) $H(x) = \frac{4}{x^2} + 1$ 411) _____

A) $f(x) = \frac{1}{x}, g(x) = \frac{4}{x} + 1$

B) $f(x) = \frac{4}{x^2}, g(x) = 1$

C) $f(x) = x + 1, g(x) = \frac{4}{x^2}$

D) $f(x) = x, g(x) = \frac{4}{x} + 1$

412) $H(x) = \frac{3}{\sqrt{5x + 2}}$ 412) _____

A) $f(x) = \sqrt{5x + 2}, \ g(x) = 3$

B) $f(x) = \frac{3}{\sqrt{x}}, \ g(x) = 5x + 2$

C) $f(x) = \frac{3}{x}, \ g(x) = 5x + 2$

D) $f(x) = 3, \ g(x) = \sqrt{5x + 2}$

413) $H(x) = (-8x + 9)^9$ 413) _____

A) $f(x) = -8x^9, g(x) = x + 9$

B) $f(x) = x^9, g(x) = -8x + 9$

C) $f(x) = -8x + 9, g(x) = x^9$

D) $f(x) = (-8x)^9, g(x) = 9$

414) $H(x) = \sqrt{-87x^2 + 12}$ 414) _____

A) $f(x) = \sqrt{-87x + 12}, g(x) = x^2$

B) $f(x) = \sqrt{-87x^2}, g(x) = \sqrt{12}$

C) $f(x) = \sqrt{x}, g(x) = -87x^2 + 12$

D) $f(x) = -87x^2 + 12, g(x) = \sqrt{x}$

415) $H(x) = \sqrt{1 - \sqrt{x - 1}}$ 415) _____

A) $f(x) = \sqrt{x - 1}, g(x) = \sqrt{1 - x}$

B) $f(x) = \sqrt{1 - x}, g(x) = \sqrt{x - 1}$

C) $f(x) = \sqrt{x - 1}, g(x) = \sqrt{x - 1}$

D) $f(x) = \sqrt{1 + x}, g(x) = \sqrt{x - 1}$

Solve the problem.

416) Suppose that P(x) represents the percentage of income spent on food in year x and I(x) represents income in year x. Determine a function F that represents total food expenditures in year x. 416) _____

A) $F(x) = (P + I)(x)$ B) $F(x) = (I - P)(x)$ C) $F(x) = \left(\frac{I}{P}\right)(x)$ D) $F(x) = (P \cdot I)(x)$

417) A balloon (in the shape of a sphere) is being inflated. The radius is increasing at a rate of 10 cm per second. Find a function, r(t), for the radius in terms of t. Find a function, V(r), for the volume of the balloon in terms of r. Find $(V \circ r)(t)$. 417) _____

A) $(V \circ r)(t) = \frac{40000\pi\sqrt{t}}{3}$

B) $(V \circ r)(t) = \frac{700\pi t^3}{3}$

C) $(V \circ r)(t) = \frac{5000\pi t^2}{3}$

D) $(V \circ r)(t) = \frac{4000\pi t^3}{3}$

418) At Allied Electronics, production has begun on the X–15 Computer Chip. The total revenue function is given by $R(x) = 49x - 0.3x^2$ and the total cost function is given by $C(x) = 11x + 12$, where x represents the number of boxes of computer chips produced. The total profit function, P(x), is such that $P(x) = R(x) - C(x)$. Find P(x). 418) _____

A) $P(x) = 0.3x^2 + 38x - 24$
B) $P(x) = -0.3x^2 + 38x - 12$
C) $P(x) = 0.3x^2 + 27x - 36$
D) $P(x) = -0.3x^2 + 27x + 12$

419) At Allied Electronics, production has begun on the X–15 Computer Chip. The total revenue function is given by $R(x) = 49x - 0.3x^2$ and the total profit function is given by $P(x) = -0.3x^2 + 46x - 15$, where x represents the number of boxes of computer chips produced. The total cost function, C(x), is such that $C(x) = R(x) - P(x)$. Find C(x). 419) _____

A) $C(x) = 4x + 20$
B) $C(x) = 5x + 11$
C) $C(x) = 3x + 15$
D) $C(x) = -0.3x^2 + 6x + 15$

420) At Allied Electronics, production has begun on the X–15 Computer Chip. The total cost function is given by $C(x) = 6x + 10$ and the total profit function is given by $P(x) = -0.3x^2 + 45x - 10$, where x represents the number of boxes of computer chips produced. The total revenue function, R(x), is such that $R(x) = C(x) + P(x)$. Find R(x). 420) _____

A) $R(x) = 51x - 0.3x^2$
B) $R(x) = 53x - 0.3x^2$
C) $R(x) = 50x - 0.6x^2$
D) $R(x) = 51x + 0.3x^2$

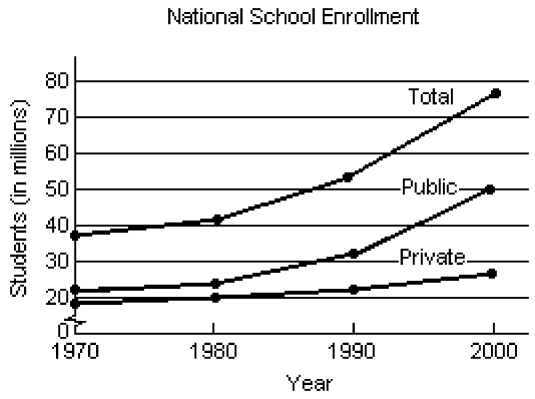
421) A stone is thrown into a pond. A circular ripple is spreading over the pond in such a way that the radius is increasing at the rate of 2.8 feet per second. Find a function, r(t), for the radius in terms of t. Find a function, A(r), for the area of the ripple in terms of r. Find $(A \circ r)(t)$. 421) _____

A) $(A \circ r)(t) = 7.84\pi^2 t$
B) $(A \circ r)(t) = 5.6\pi t^2$
C) $(A \circ r)(t) = 2.8\pi t^2$
D) $(A \circ r)(t) = 7.84\pi t^2$

422) Ken is 6 feet tall and is walking away from a streetlight. The streetlight has its light bulb 14 feet above the ground, and Ken is walking at the rate of 1.3 feet per second. Find a function, d(t), which gives the distance Ken is from the streetlight in terms of time. Find a function, S(d), which gives the length of Ken's shadow in terms of d. Then find $(S \circ d)(t)$. 422) _____

A) $(S \circ d)(t) = 2.2t$
B) $(S \circ d)(t) = 0.98t$
C) $(S \circ d)(t) = 0.72t$
D) $(S \circ d)(t) = 1.24t$

423) The following graph shows the private, public and total national school enrollment for students for s years from 1970 through 2000. 423) _____



i) How is the graph for total school enrollment, T, determined from the graph of the private enroll r, and the public enrollment, u?
ii) During which 10–year period did the total number of students enrolled increase the least?
iii) During which 10–year period did the total number of students enrolled increase the most?

A) i) T is the sum of r and u.
ii) 1970 – 1980
iii) 1980–1990

B) i) T is the sum of r and u.
ii) 1970 – 1980
iii) 1990–2000

C) i) T is the difference of r and u.
ii) 1970 – 1980
iii) 1990–2000

D) i) T is the sum of r and u.
ii) 1990–2000
iii) 1970–1980

424) A firm is considering a new product. The accounting department estimates that the total cost, C(x), c producing x units will be 424) _____

$C(x) = 85x + 6470.$

The sales department estimates that the revenue, R(x), from selling x units will be

$R(x) = 95x,$

but that no more than 948 units can be sold at that price. Find and interpret (R – C)(948).

A) $1595 profit, income exceeds cost
It is worth it to develop product.

B) $177,110 profit, income exceeds cost
It is worth it to develop product.

C) –$3010 loss, cost exceeds income
It is not worth it to develop product.

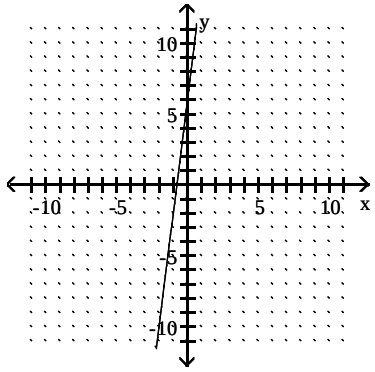
D) $3010 profit, income exceeds cost
It is worth it to develop product.

425) The function $f(t) = -0.14t^2 + 0.5t + 30.9$ models the U.S. population in millions, ages 65 and older, where t represents years after 1990. The function $g(t) = 0.54t^2 + 11.69t + 107$ models the total yearly cost of Medicare in billions of dollars, where t represents years after 1990. What does the function $\frac{g}{f}$ represent? Find $\frac{g}{f}(5)$. 425) _____

A) Cost per person in thousands of dollars. $11.99 thousand
B) Cost per person in thousands of dollars. $5.98 thousand
C) Cost per person in thousands of dollars. $0.21 thousand
D) Cost per person in thousands of dollars. $0.17 thousand

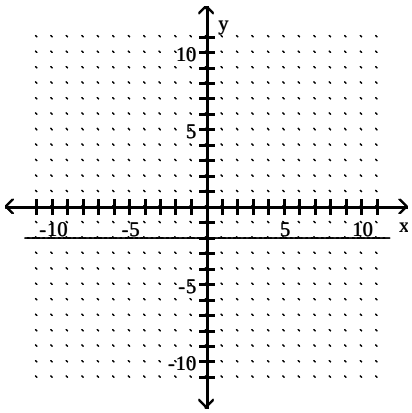
Using the horizontal–line test, determine whether the function is one–to–one.

426) 426) _____



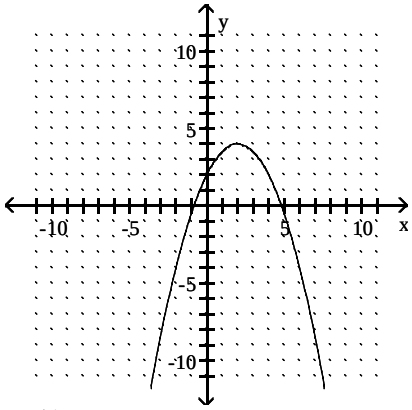
A) one–to–one B) not one–to–one

427) 427) _____



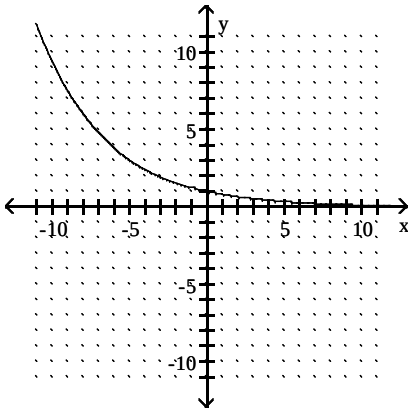
A) one–to–one B) not one–to–one

428) 428) _____



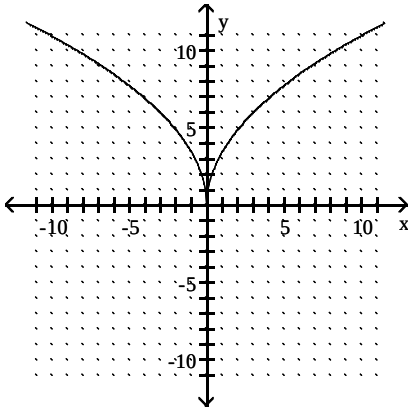
A) one–to–one B) not one–to–one

429) 429) _____



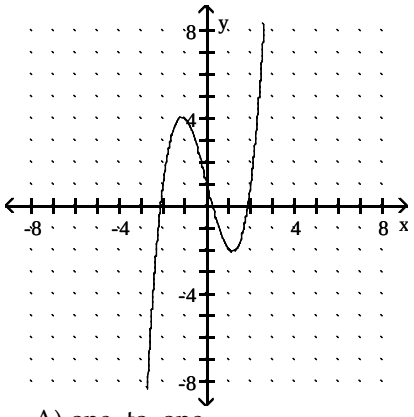
A) one-to-one B) not one-to-one

430) 430) _____



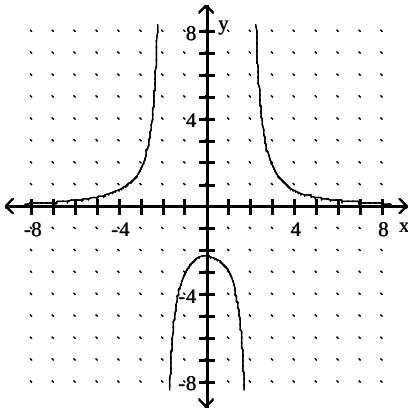
A) one-to-one B) not one-to-one

431) 431) _____



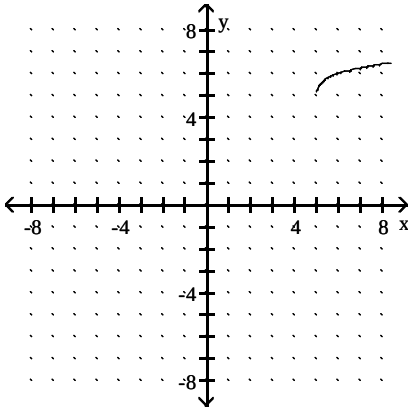
A) one-to-one B) not one-to-one

432) 432) _____



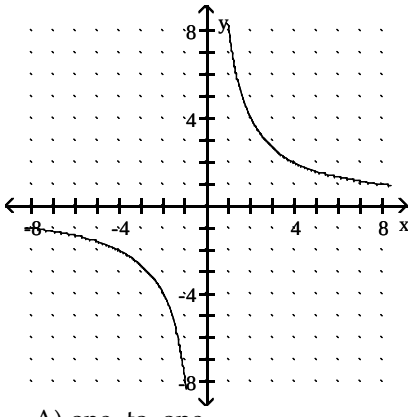
A) one-to-one B) not one-to-one

433) 433) _____

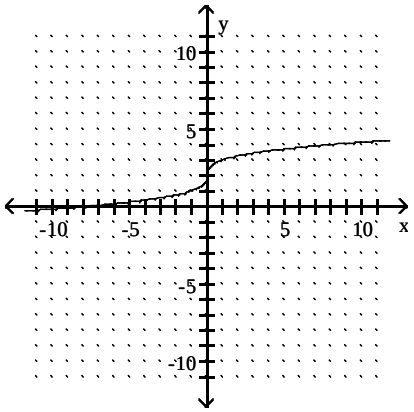


A) one-to-one B) not one-to-one

434) 434) _____



A) one-to-one B) not one-to-one

435) 

435) _____

A) one-to-one B) not one-to-one

Assume the functions are one-to-one. Find the requested inverse.

436) If $f(4) = 3$, find $f^{-1}(3)$ 436) _____

A) 3 B) 9 C) 4 D) -1

437) If $g(-4) = 5$, find $g^{-1}(5)$ 437) _____

A) -4 B) 3 C) 7 D) 5

438) Find $(f \circ f^{-1})(7)$ 438) _____

A) -1 B) 5 C) 1 D) 7

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

Show that f and g are inverses of each other by verifying that f(g(x)) = x = g(f(x)).

439) $f(x) = 9x$; $g(x) = \frac{x}{9}$ 439) _____

440) $f(x) = \frac{x + 4}{7}$; $g(x) = 7x - 4$ 440) _____

441) $f(x) = \sqrt{x}$; $g(x) = x^2$ 441) _____

442) $f(x) = \sqrt{9 - x}$; $g(x) = 9 - x^2$ 442) _____

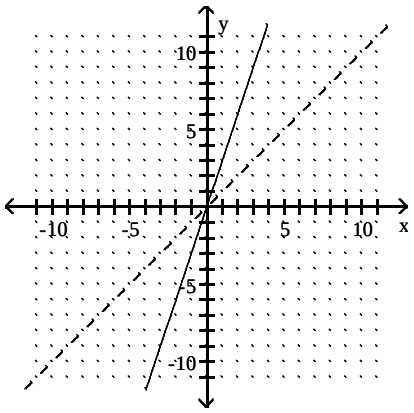
443) $f(x) = x^3 - 3$; $g(x) = \sqrt[3]{x + 3}$ 443) _____

444) $f(x) = \sqrt[3]{x + 9}$; $gx) = x^3 - 9$ 444) _____

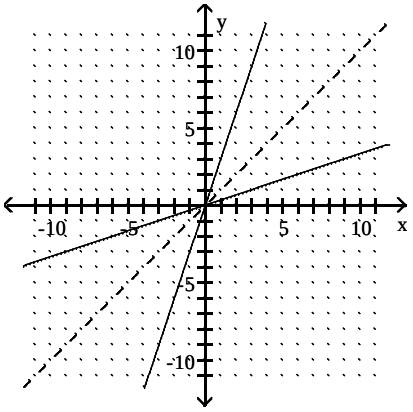
445) $f(x) = \frac{9 + x}{x}$; $g(x) = \frac{9}{x - 1}$ 445) _____

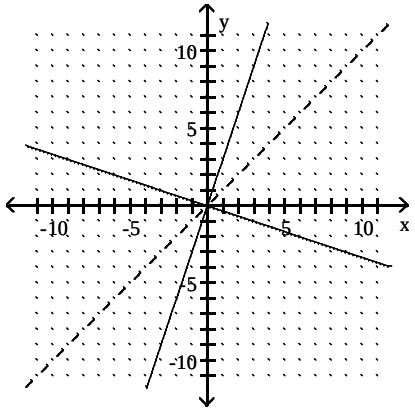
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

The graph of a function f is given. On the same axes, sketch the graph of f^{-1}.

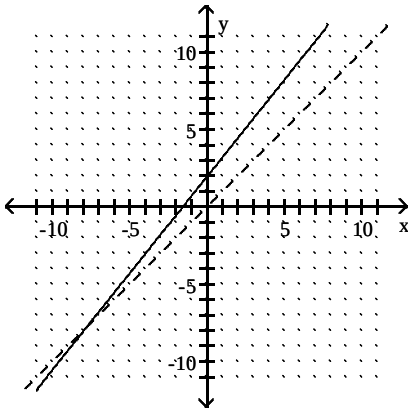
446) 

446) _____

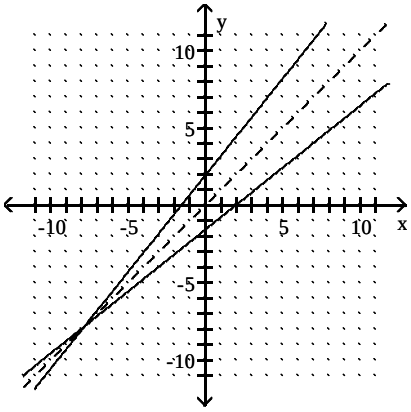
A) 

B) 

447) 447) _____



A)



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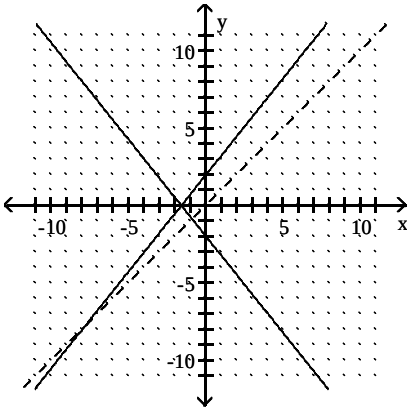
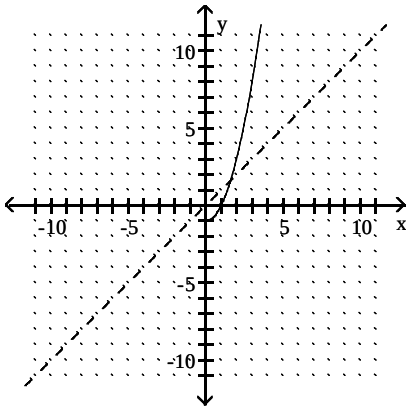
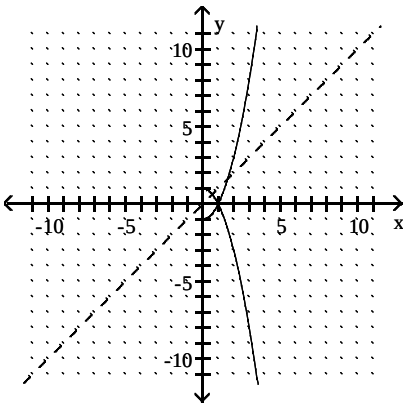


448) 448) _____



A)



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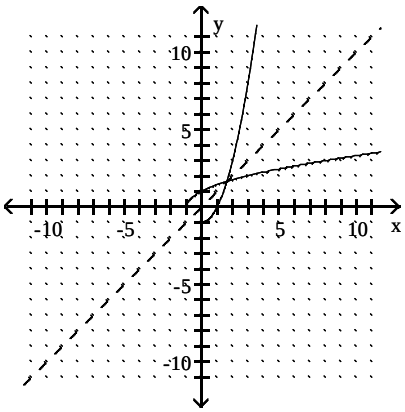
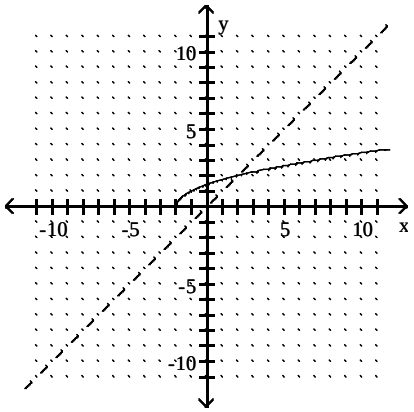
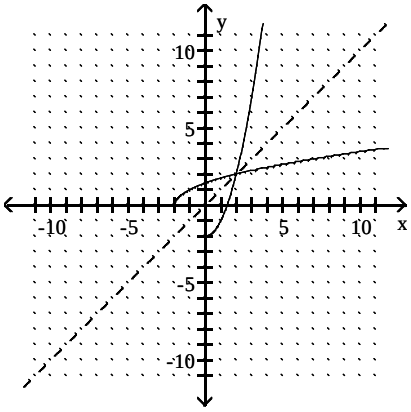


449)

449) _____



A)



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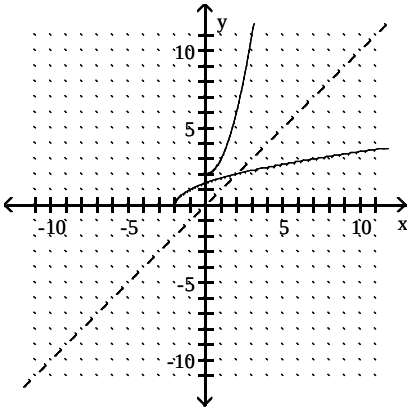
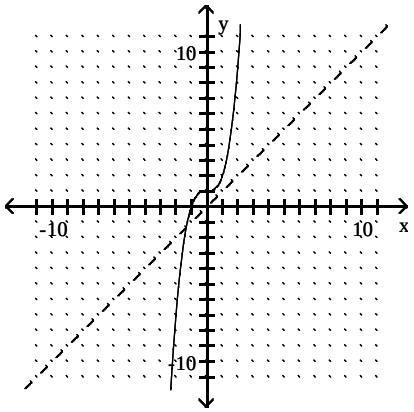
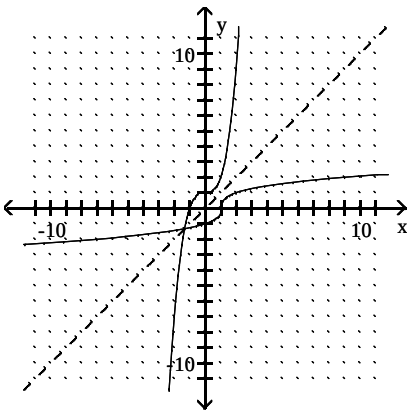


450) 450) _____



A)



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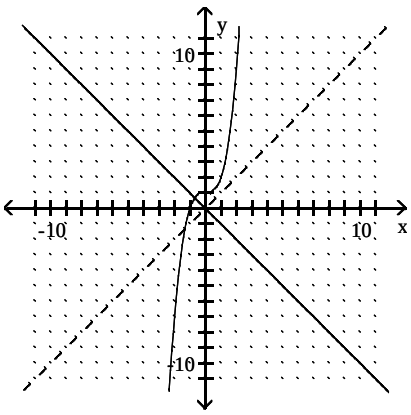
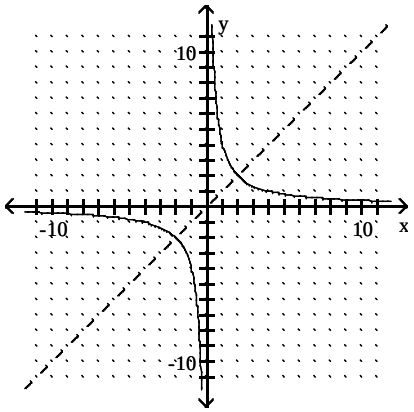
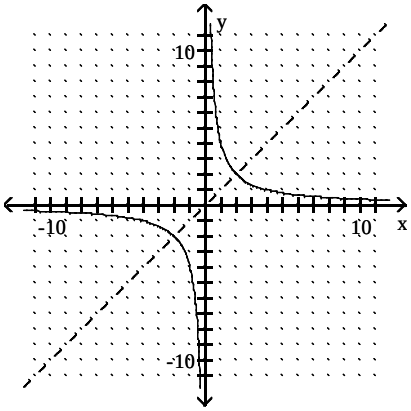


451) 451) _____



A)



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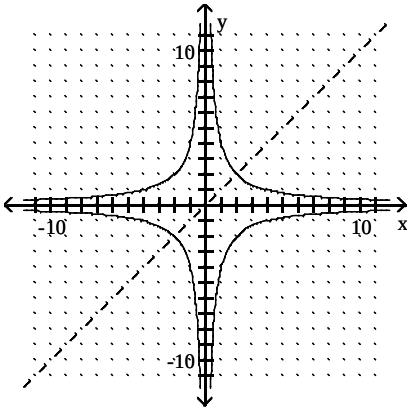
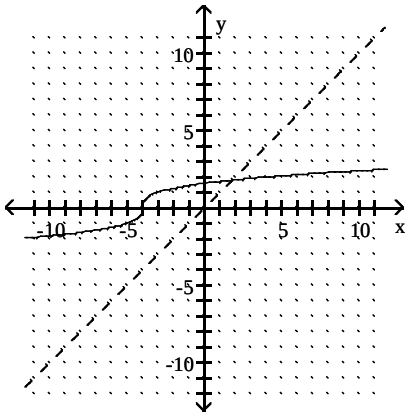
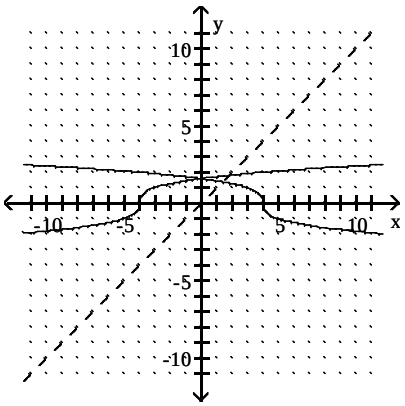


452) 452) _____



A)



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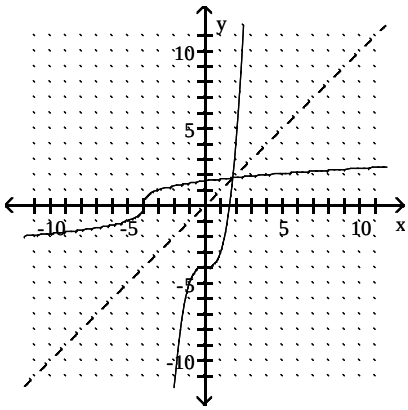
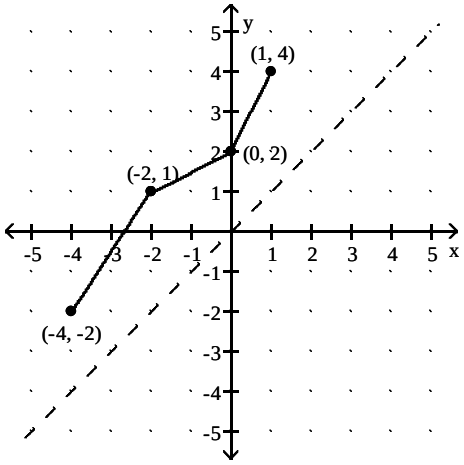
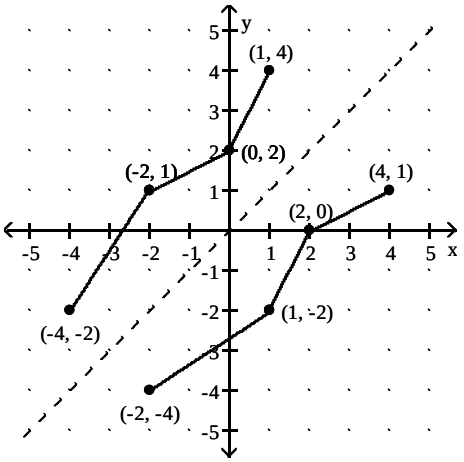


453) 453) _____



A)



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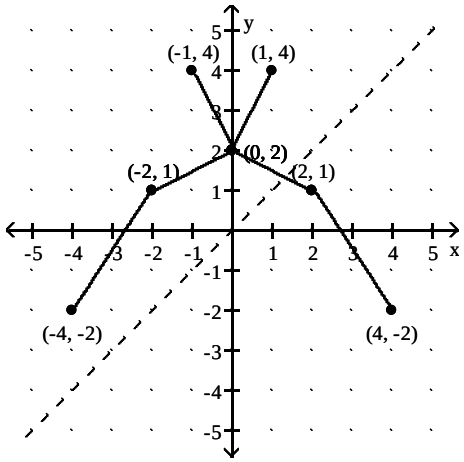


Determine whether the given function is one–to–one. If it is one–to–one, find its inverse.

454) $f(x) = 2 - x$ 454) _____

A) $f^{-1}(x) = 2 - x$ B) $f^{-1}(x) = \frac{x}{2}$ C) $f^{-1}(x) = x - 2$ D) $f^{-1}(x) = x + 2$

455) $f(x) = 4x - 24$ 455) _____

A) $f^{-1}(x) = \frac{1}{6}x + 4$ B) $f^{-1}(x) = \frac{1}{4}x + 6$ C) $f^{-1}(x) = 4x + 24$ D) $f^{-1}(x) = \frac{1}{4}x - 6$

456) $f(x) = 8x + 6$ 456) _____

A) $f^{-1}(x) = \frac{x - 6}{8}$ B) Not one–to–one

C) $f^{-1}(x) = \frac{x}{8} - 6$ D) $f^{-1}(x) = \frac{x + 6}{8}$

457) $f(x) = -\frac{6}{x}, x \neq 0$ 457) _____

A) $f^{-1}(x) = -6x$ B) $f^{-1}(x) = -\frac{6}{x}$ C) $f^{-1}(x) = \frac{6}{x}$ D) $f^{-1}(x) = -\frac{x}{6}$

458) $f(x) = \frac{5}{x + 9}$ 458) _____

A) $f^{-1}(x) = \frac{x}{9 + 5x}$

B) $f^{-1}(x) = \frac{9 + 5x}{x}$

C) Not one-to-one

D) $f^{-1}(x) = \frac{-9x + 5}{x}$

459) $f(x) = \sqrt{x - 7}$ 459) _____

A) $f^{-1}(x) = (x - 7)^2$

B) $f^{-1}(x) = x^2 + 7, x \geq 0$

C) $f^{-1}(x) = \sqrt{x + 7}$

D) Not one-to-one

460) $f(x) = x\sqrt{3 - x^2}$ 460) _____

A) $f^{-1}(x) = x^3 - 3$

B) Not one-to-one

C) $f^{-1}(x) = x\sqrt{3 - x^2}$

D) $f^{-1}(x) = x^2 + 3$

461) $f(x) = \sqrt[3]{x} - 2$ 461) _____

A) $f^{-1}(x) = (x - 2)^3$ B) $f^{-1}(x) = \sqrt[3]{x} + 2$ C) $f^{-1}(x) = x^3 + 2$ D) $f^{-1}(x) = (x + 2)^3$

462) $f(x) = \sqrt[3]{x + 6}$ 462) _____

A) $f^{-1}(x) = (x - 6)^3$ B) $f^{-1}(x) = (x + 6)^3$ C) $f^{-1}(x) = \sqrt[3]{x} + 6$ D) $f^{-1}(x) = x^3 - 6$

463) $f(x) = 6x^2 + 2, x \geq 0$ 463) _____

A) $f^{-1}(x) = \frac{6}{\sqrt{x - 2}}$

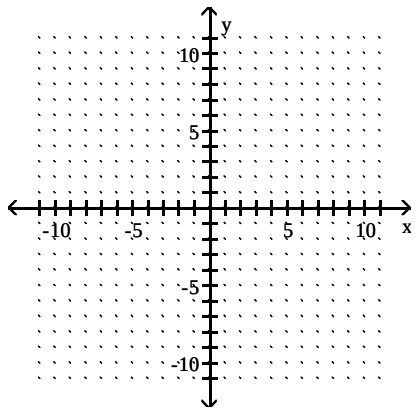
B) $f^{-1}(x) = \sqrt{\frac{x - 2}{6}}$

C) $f^{-1}(x) = \sqrt{\frac{6}{x - 2}}$

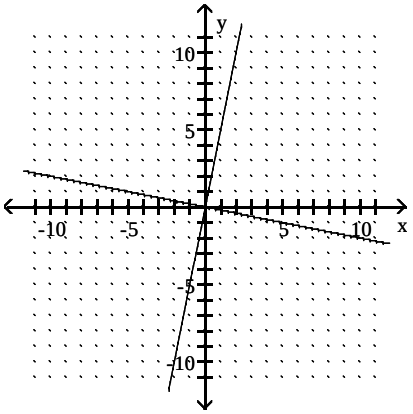
D) Not one-to-one

Sketch the graph of the function and its inverse on the same coordinate axes.

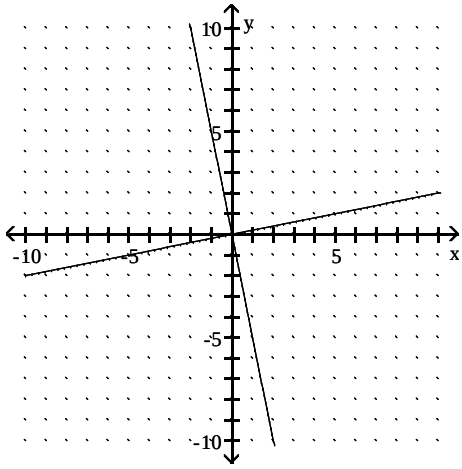
464) $f(x) = 5x$ 464) _____



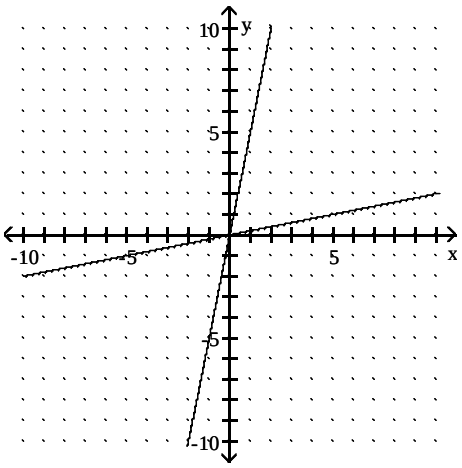
A)



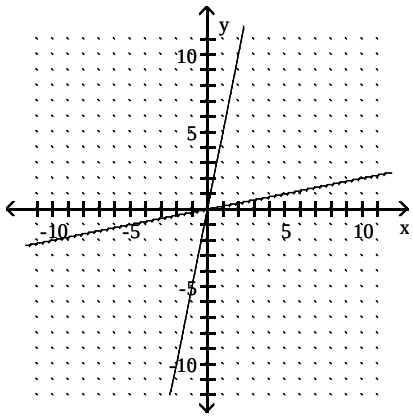
B)



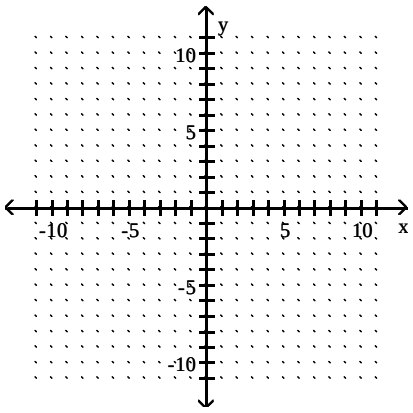
C)



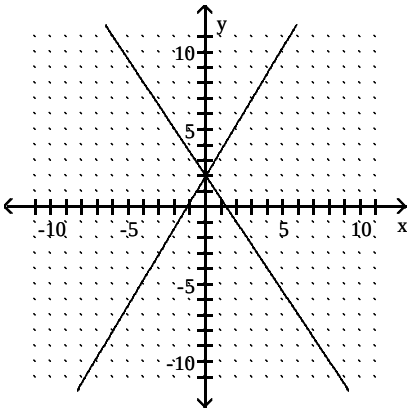
D)



465) $f(x) = \frac{5}{3}x + 2$ 465) _____



A)



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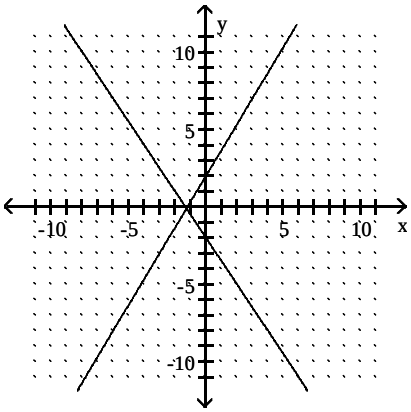

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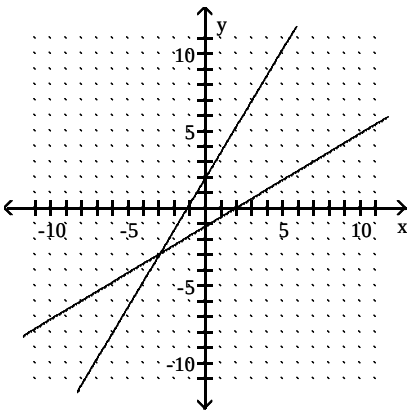

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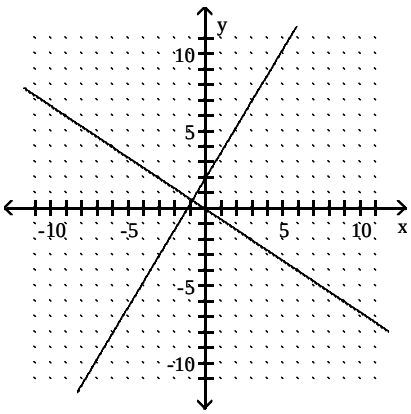
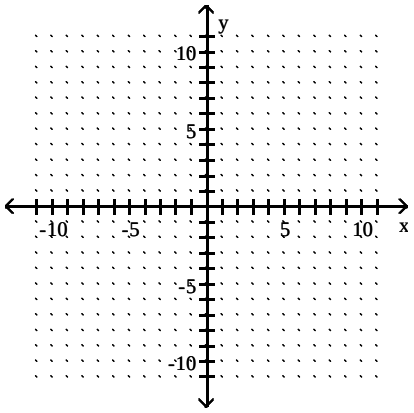
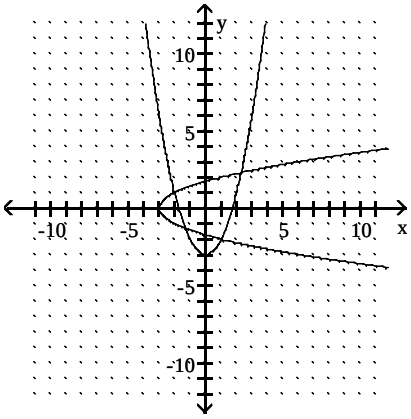


466) $y = \sqrt{x + 3}$

466) _____



A)



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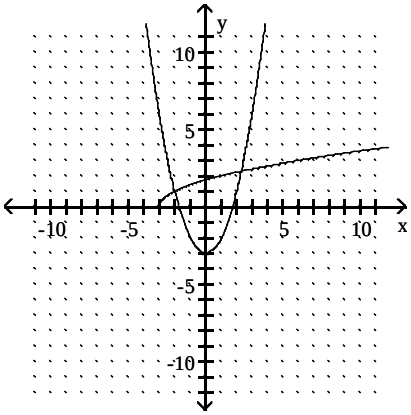

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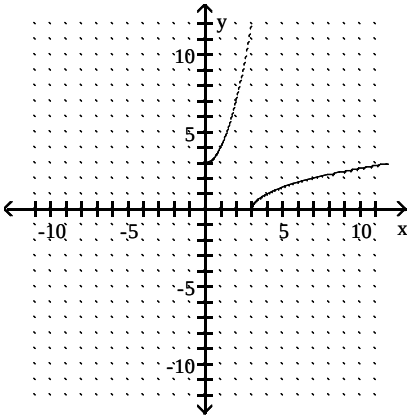

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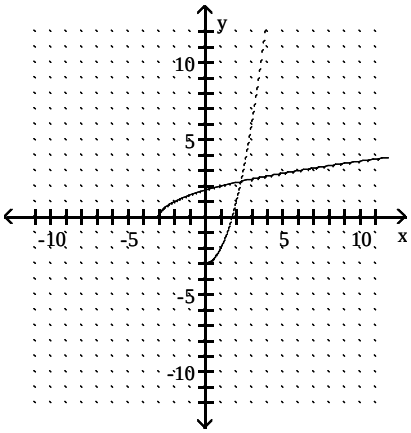
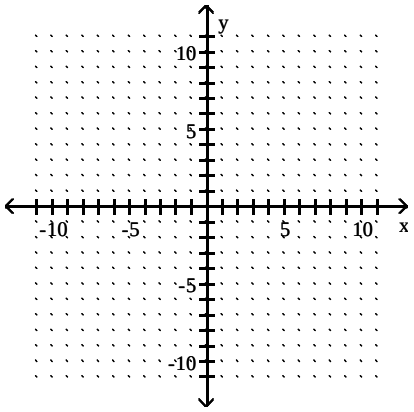
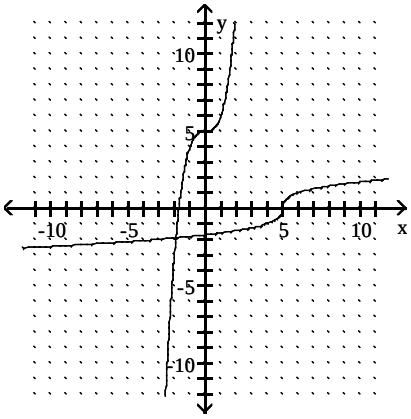


467) $y = x^3 + 5$

467) _____



A)



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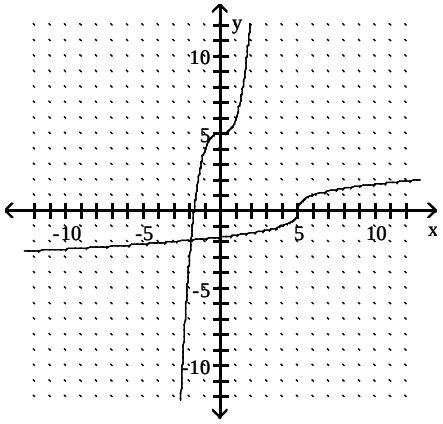

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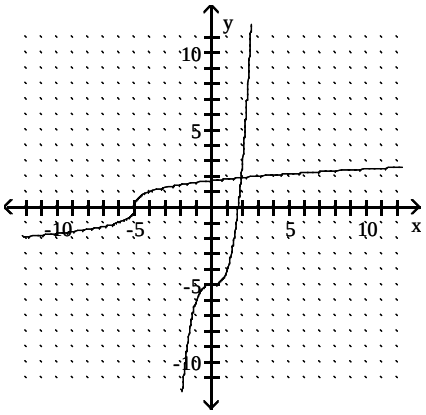
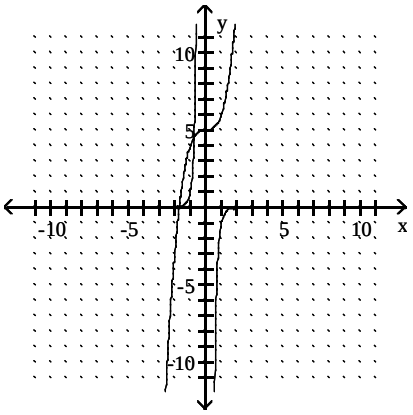
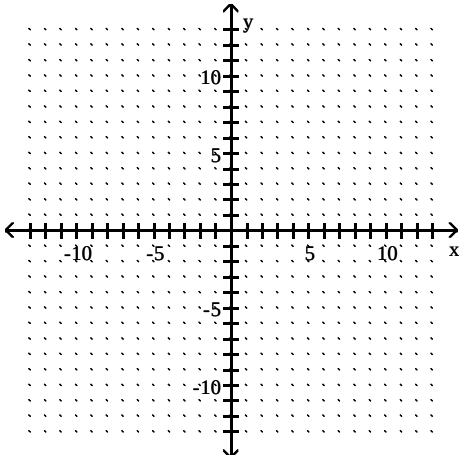


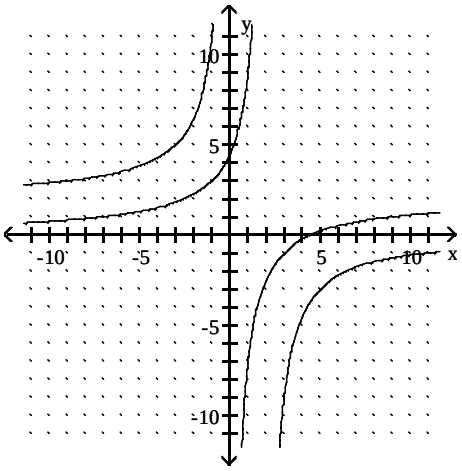
D)



468) $f(x) = \frac{2}{x - 9}$ 468) _____



A)



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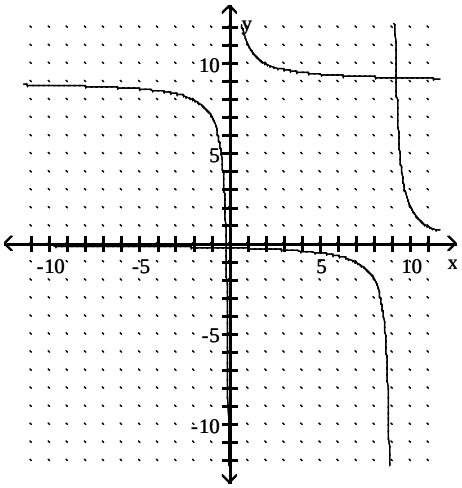

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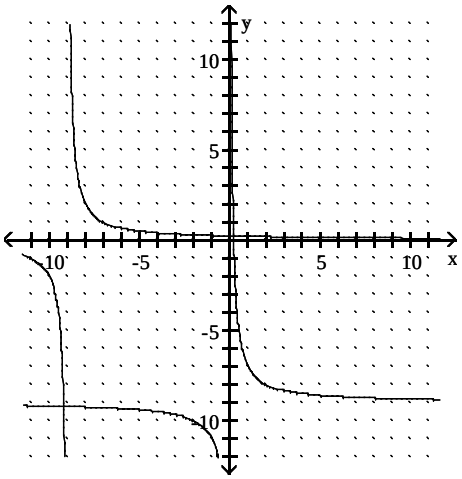
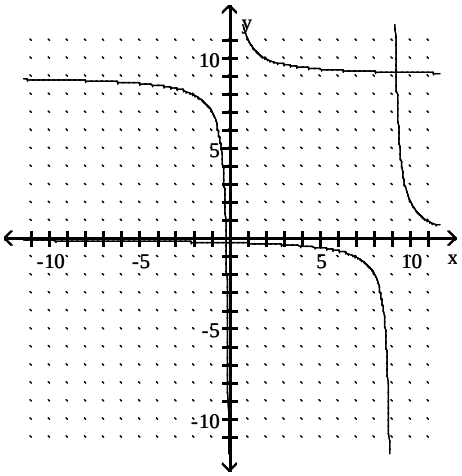
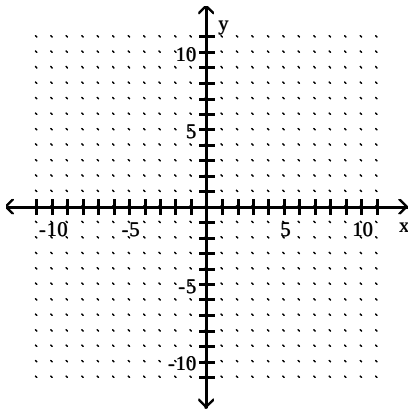


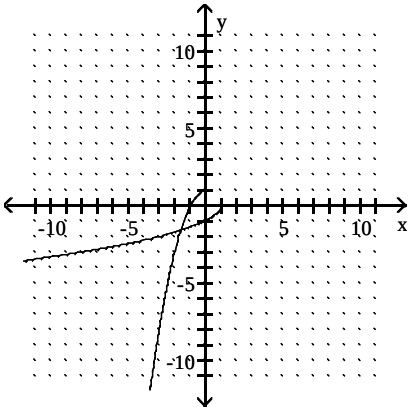
D)



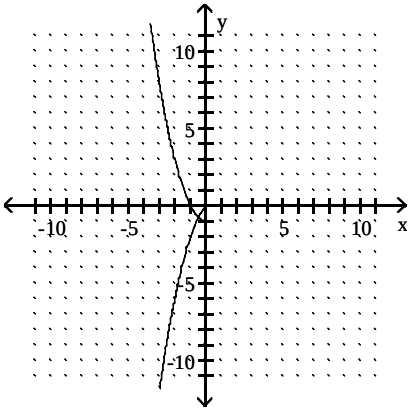
469) $f(x) = 1 - x^2$ for $x \leq 0$ 469) _____



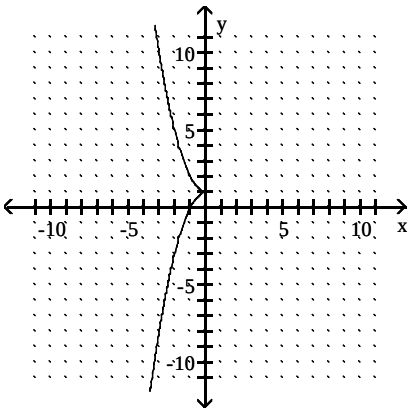
A)



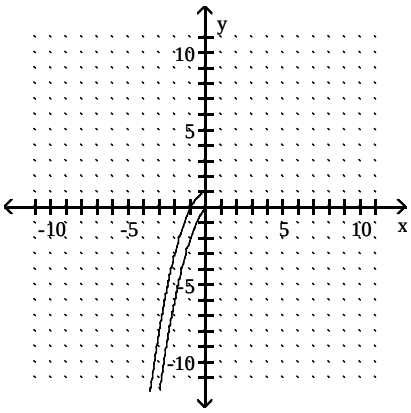
B)



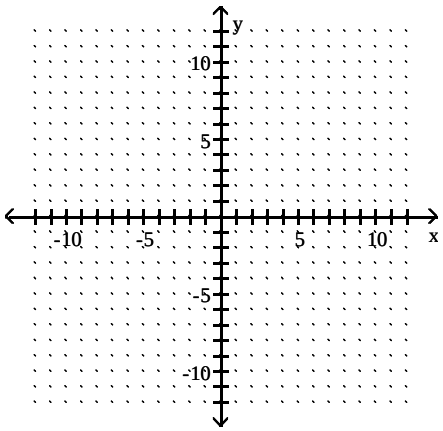
C)



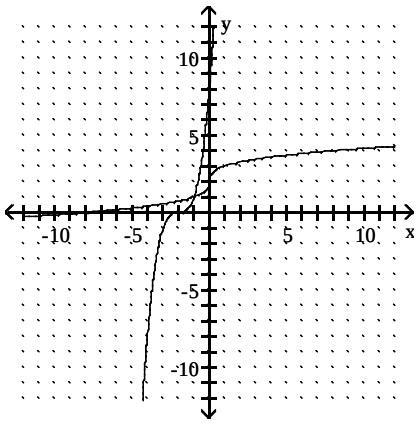
D)



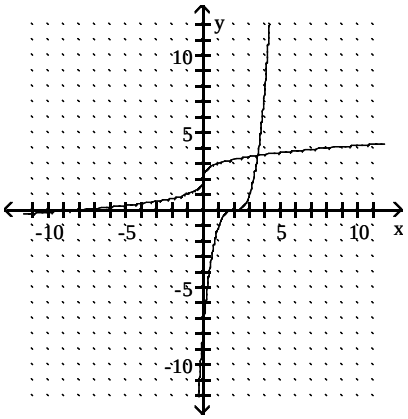
470) $f(x) = (x + 2)^3$ 470) _____



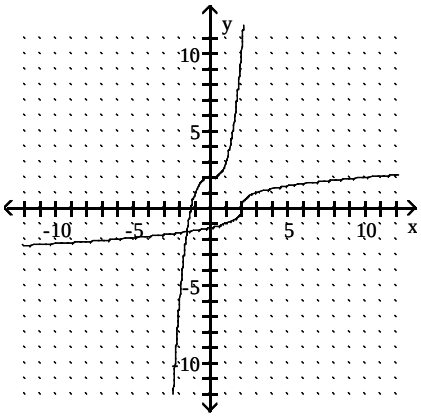
A)



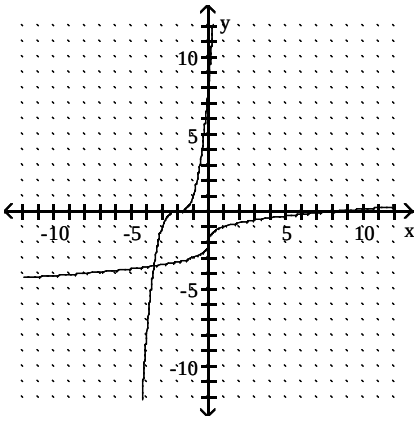
B)



C)



D)



Solve the problem.

471) A size 10 dress in Country C is size 32 in Country D. A function that converts dress sizes in Country C to those in Country D is $f(x) = x + 22$. Find the inverse of the function. 471) _____

A) $f^{-1}(x) = \frac{x}{-22}$ B) $f^{-1}(x) = x + 22$ C) $f^{-1}(x) = x - 22$ D) $f^{-1}(x) = \frac{x}{22}$

472) A size 42 dress in Country C is size 9 in Country D. A function that converts dress sizes in Country C to those in Country D is $f(x) = \frac{x}{2} - 12$. Find the inverse of the function. 472) _____

A) $f^{-1}(x) = 2(x - 12)$
B) $f^{-1}(x) = 2(x + 12)$
C) $f^{-1}(x) = 2x + 12$
D) $f^{-1}(x) = x + 12$

473) A size 8 dress in Country C is size 40 in Country D. A function that converts dress sizes in Country C to those in Country D is $f(x) = 2(x + 12)$. Find the inverse of the function. 473) _____

A) $f^{-1}(x) = \frac{x}{2} + 12$
B) $f^{-1}(x) = \frac{x}{2} - 12$
C) $f^{-1}(x) = x - 12$
D) $f^{-1}(x) = \frac{x - 12}{2}$

474) 32° Fahrenheit = 0° Celsius. A function that converts temperatures in Fahrenheit to those in Celsius is $f(x) = \frac{5}{9}(x - 32)$. Find the inverse of the function. 474) _____

A) $f^{-1}(x) = \frac{5}{9}(x - 32)$
B) $f^{-1}(x) = \frac{9}{5}x - 32$
C) $f^{-1}(x) = x + 32$
D) $f^{-1}(x) = \frac{9}{5}x + 32$

475) An organization determines that the cost per person of chartering a bus is given by the formula 475) _____

$$C(x) = \frac{250 + 6x}{x},$$

where x is the number of people in the group and C(x) is in dollars. Find the inverse of the function.

A) $C^{-1}(x) = \frac{250}{x - 6}$
B) $C^{-1}(x) = \frac{250 + x}{6}$
C) $C^{-1}(x) = \frac{6}{x - 250}$
D) $C^{-1}(x) = \frac{250}{x + 6}$

476) Let f(x) compute the time in hours to travel x miles at 46 miles per hour. What does $f^{-1}(x)$ compute? 476) _____

A) The miles traveled in 46 hours
B) The hours taken to travel 46 miles
C) The hours taken to travel x miles
D) The miles traveled in x hours

477) Let f(x) compute the time in hours to travel x miles at 46 miles per hour. What is the interpretation of $f^{-1}(7)$? 477) _____

A) The hours taken to travel 46 miles
B) The hours taken to travel 7 miles
C) The miles traveled in 46 hours
D) The miles traveled in 7 hours

478) Let f(x) compute the cost of a rental car after x days of use at $36 per day. What does $f^{-1}(x)$ compute? 478) _____

A) The number of days rented for 36 dollars
B) The cost of rental for 36 days
C) The number of days rented for x dollars
D) The cost of rental for x days

479) Let f(x) compute the cost of a rental car after x days of use at $22 per day. What is the interpretation of the solution of $f^{-1}(x) = 154$? 479) _____

A) The cost of rental for 22 days
B) The number of days rented for $154
C) The number of days rented for $22
D) The cost of rental for 154 days

480) To remodel a bathroom, a contractor charges $25 per hour plus material costs, which amount to $3625. Therefore, the total cost to remodel the bathroom is given by $f(x) = 25x + 3625$ where x is the number of hours the contractor works. Find $f^{-1}(x)$. What does $f^{-1}(x)$ compute? 480) _____

A) $f^{-1}(x) = \frac{x}{25} - 3625$; This computes the number of hours worked if the total cost is x dollars.

B) $f^{-1}(x) = \frac{x}{25} - 145$; This computes the total cost if the contractor works x hours.

C) $f^{-1}(x) = \frac{x}{25} - 3625$; This computes the total cost if the contractor works x hours.

D) $f^{-1}(x) = \frac{x}{25} - 145$; This computes the number of hours worked if the total cost is x dollars.

Answer Key
Testname: UNTITLED1

1) B
2) A
3) D
4) B
5) C
6) B
7) C
8) C
9) C
10) A
11) A
12) A
13) B
14) B
15) A
16) B
17) D
18) A
19) B
20) A
21) B
22) C
23) A
24) C
25) B
26) C
27) C
28) D
29) B
30) C
31) D
32) A
33) B
34) A
35) B
36) A
37) B
38) A
39) A
40) B
41) A
42) C
43) B
44) D
45) C
46) B
47) D
48) D
49) A
50) C

51) B
52) B
53) A
54) D
55) D
56) A
57) B
58) C
59) C
60) D
61) A
62) A
63) A
64) A
65) B
66) C
67) C
68) C
69) C
70) C
71) B
72) C
73) D
74) C
75) D
76) A
77) C
78) D
79) D
80) A
81) A
82) D
83) C
84) C
85) B
86) C
87) A
88) A
89) C
90) D
91) C
92) B
93) A
94) D
95) B
96) B
97) C
98) C
99) A
100) C

Answer Key
Testname: UNTITLED1

101) D
102) A
103) C
104) B
105) A
106) D
107) C
108) B
109) B
110) D
111) C
112) D
113) C
114) C
115) A
116) B
117) B
118) D
119) A
120) C
121) A
122) A
123) B
124) B
125) D
126) C
127) D
128) B
129) D
130) A
131) D
132) B
133) B
134) C
135) A
136) D
137) C
138) D
139) B
140) A
141) D
142) C
143) C
144) A
145) C
146) C
147) D
148) A
149) B
150) D

151) B
152) C
153) D
154) A
155) A
156) B
157) B
158) B
159) A
160) A
161) C
162) C
163) B
164) A
165) B
166) A
167) B
168) A
169) B
170) C
171) D
172) D
173) B
174) A
175) A
176) D
177) C
178) D
179) D
180) A
181) C
182) B
183) B
184) B
185) D
186) B
187) A
188) C
189) A
190) D
191) No. In the slope–intercept form of the equation of a line, x is multiplied by slope; however, the slope of a vertical line is undefined. (Explanations will vary.)
192) B
193) C
194) C
195) A
196) A
197) A
198) A
199) A

200) A
201) A
202) B
203) B
204) B
205) A
206) A
207) A
208) C
209) B
210) B
211) A
212) A
213) C
214) B
215) B
216) A
217) B
218) D
219) D
220) A
221) B
222) A
223) A
224) A
225) A
226) A
227) A
228) B
229) B
230) B
231) B
232) A
233) D
234) B
235) D
236) C
237) C
238) C
239) B
240) C
241) a. Domain: (-∞, ∞); Range: [–3:3]
b. x–intercept: 0; y–intercept: 0
c. f(–4) = –1, f(–2) = –3, f(2) = 3
d. [2, ∞)
242) a. Domain: (-∞, ∞); Range: [0:4]
b. x–intercept: 0; y–intercept: 0
c. f(–4) = 1, f(0) = 0, f(4) = 4
d. ∅

243) a. Domain: (-∞, ∞); Range: [–2, ∞)
b. x–intercepts: 0, 6; y–intercept: 0
c. f(0) = 0, f(6) = 0
d. ∅

244) a. Domain: [–2, ∞); Range: [–2, ∞)
b. x–intercepts: $-\frac{3}{2}$, 2, 4; y–intercept: 2
c. f(–2) = –2, f(1) = 2, f(3) = –1
d. [–1, 1]

245) a. Domain: [0, 12]; Range: [1:6]
b. x–intercept: none; y–intercept: 1
c. f(0) = 1, f(1) = 2, f(12) = 1
d. {5}

246) A
247) B
248) B
249) C
250) A
251) C
252) D
253) B
254) B
255) A
256) D

257) a. Domain: (-∞, ∞); Range: [–3:3]
b. x–intercept: 0; y–intercept: 0
c. constant on (-∞, –3), decreasing on (–3,–2), increasing on (–2,2), constant on (2, ∞)
d. Neither even nor odd.

258) a. Domain: (-∞, ∞); Range: [0:4]
b. x–intercept: 0; y–intercept: 0
c. constant on (-∞, –1), decreasing on (–1, 0), increasing on (0, 3), constant on (3, ∞)
d. Neither even nor odd.

259) a. Domain: (-∞, ∞); Range: [–2, ∞)
b. x–intercepts: 0, 6; y–intercept: 0
c. decreasing on (-∞, 3), increasing on (3, ∞)
d. Neither even nor odd.

260) a. Domain: [–2, ∞); Range: [–2, ∞)
b. x–intercepts: $-\frac{3}{2}$, 2, 4; y–intercept: 2
c. increasing on (–2, –1), constant on (–1, 1), decreasing on (1, 3), increasing on (3, ∞)
d. Neither even nor odd.

261) a. Domain: [0, 12]; Range: [1:6]
b. x–intercept: none; y–intercept: 1
c. increasing on (0, 5), decreasing on (5, 12)
d. Neither even nor odd.

262) A
263) D
264) A
265) C

266) C
267) B
268) A
269) D
270) A
271) B
272) C
273) A
274) A
275) B
276) B
277) A
278) C
279) D
280) A
281) D
282) D
283) B
284) B
285) C
286) A
287) C
288) A
289) A
290) A
291) A
292) D
293) A
294) A
295) B
296) C
297) D
298) D
299) A
300) B
301) C
302) A
303) C
304) A
305) D
306) D
307) A
308) D
309) C
310) C
311) A
312) A
313) A
314) B
315) A

316) A
317) C
318) C
319) B
320) A
321) A
322) A
323) A
324) B
325) B
326) A
327) A
328) C
329) A
330) D
331) A
332) A
333) A
334) C
335) D
336) C
337) D
338) D
339) B
340) A
341) D
342) D
343) D
344) C
345) C
346) D
347) B
348) A
349) A
350) D
351) D
352) C
353) C
354) C
355) C
356) B
357) C
358) D
359) A
360) D
361) A
362) C
363) B
364) B
365) D

366) C
367) D
368) D
369) D
370) B
371) A
372) C
373) D
374) D
375) B
376) C
377) A
378) D
379) C
380) B
381) A
382) D
383) D
384) D
385) C
386) C
387) B
388) B
389) A
390) D
391) D
392) D
393) C
394) C
395) A
396) A
397) B
398) B
399) D
400) B
401) C
402) B
403) D
404) B
405) C
406) B
407) C
408) D
409) D
410) A
411) C
412) B
413) B
414) C
415) B

416) D
417) D
418) B
419) C
420) A
421) D
422) B
423) B
424) D
425) B
426) A
427) B
428) B
429) A
430) B
431) B
432) B
433) A
434) A
435) A
436) C
437) A
438) D
439) $f(g(x)) = f\left(\frac{x}{9}\right) = 9 \cdot \frac{x}{9} = x$

$g(f(x)) = g(9x) = \frac{9x}{9} = x$

440) $f(g(x)) = f(7x - 4) = ((7x - 4) + 4)/7 = 7x/7 = x$

$g(f(x)) = g((x + 4)/7) = 7((x + 4)/7) - 4 = (x + 4) - 4 = x$

441) $f(g(x)) = f(x^2) = \sqrt{x^2} = x$

$g(f(x)) = g(\sqrt{x}) = (\sqrt{x})^2 = x$

442) $f(g(x)) = f(9 - x^2) = \sqrt{9 - (9 - x^2)} = \sqrt{9 - 9 + x^2} = \sqrt{x^2} = x$

$g(f(x)) = g(\sqrt{9 - x}) = 9 - (\sqrt{9 - x})^2 = 9 - (9 - x) = 9 - 9 + x = x$

443) $f(gx)) = f\left(\sqrt[3]{x + 3}\right) = \left(\sqrt[3]{x + 3}\right)^3 - 3 = x + 3 - 3 = x$

$g(f(x)) = g(x^3 - 3) = \sqrt[3]{(x^3 - 3) + 3} = \sqrt[3]{x^3} = x$

444) $f(g(x)) = f(x^3 - 9) = \sqrt[3]{(x^3 - 9) + 9} = \sqrt[3]{x^3} = x$

$g(f(x)) = g\left(\sqrt[3]{x + 9}\right) = \left(\sqrt[3]{x + 9}\right)^3 - 9 = x + 9 - 9 = x$

Answer Key
Testname: UNTITLED1

445) $f(g(x)) = f\left(\frac{9}{x-1}\right) = \frac{9 + \frac{9}{x-1}}{\frac{9}{x-1}} = \frac{\frac{9(x-1)+9}{x-1}}{\frac{9}{x-1}} = \frac{\frac{9x-9+9}{x-1}}{\frac{9}{x-1}} = \frac{9x-9+9}{9} = \frac{9x}{9} = x$

$g(f(x)) = g\left(\frac{9+x}{x}\right) = \frac{9}{\frac{9+x}{x} - 1} = \frac{9}{\frac{9+x-x}{x}} = \frac{9}{\frac{9}{x}} = 9 \cdot \frac{x}{9} = x$

446) A
447) A
448) B
449) A
450) A
451) A
452) B
453) A
454) A
455) B
456) A
457) B
458) D
459) B
460) B
461) D
462) D
463) B
464) D
465) C
466) D
467) A
468) B
469) A
470) D
471) C
472) B
473) B
474) D
475) A
476) D
477) D
478) C
479) D
480) D