Test Bank for College Algebra Graphs and Models 5th Edition by Bittinger ISBN 0321783956 9780321783950
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Test Bank:

Solution Manual:

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
**Determine the intervals on which the function is increasing, decreasing, and constant.**
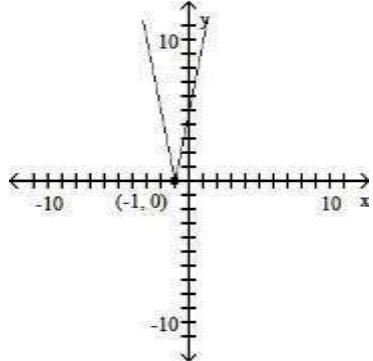
1)

A) Increasing on $(1, \infty)$; Decreasing on $(-\infty, 1)$
B) Increasing on $(-1, \infty)$; Decreasing on $(-\infty, -1)$
C) Increasing on $(-\infty, -1)$; Decreasing on $(-1, \infty)$
D) Increasing on $(-\infty, 1)$; Decreasing on $(1, \infty)$

1) _____
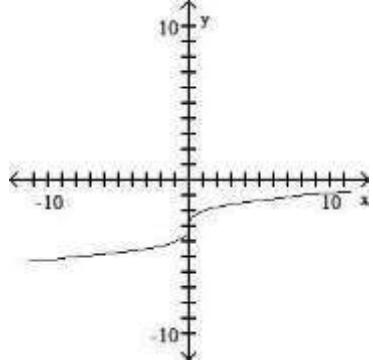
2)

A) Increasing on $(-\infty, \infty)$

B) Increasing on $(-\infty, 0)$; Decreasing on $(0, \infty)$

C) Increasing on $(0, \infty)$; Decreasing on $(-\infty, 0)$

D) Decreasing on $(-\infty, \infty)$

2) _____

3)

3) _____

A) Increasing on (4, ∞); Decreasing on (-4, ∞); Constant on (-4, 4)
B) Increasing on (-∞, 4); Decreasing on (-∞, -4); Constant on (4, ∞)
C) Increasing on (4, ∞); Decreasing on (-∞, -4); Constant on (-4, 4)
D) Increasing on (-∞, 4); Decreasing on (-4, ∞); Constant on (4, ∞)

4)

4)
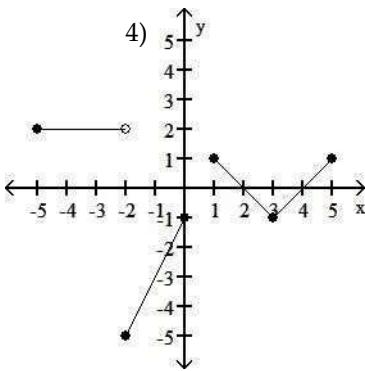

A) Increasing on (-1, 0) and (3, 5); Decreasing on (0, 3); Constant on (-5, -3)
B) Increasing on (1, 3); Decreasing on (-2, 0) and (3, 5); Constant on (2, 5)
C) Increasing on (-2, 0) and (3, 5); Decreasing on (1, 3); Constant on (-5, -2)
D) Increasing on (-2, 0) and (3, 4); Decreasing on (-5, -2) and (1, 3)

5)

5) _____
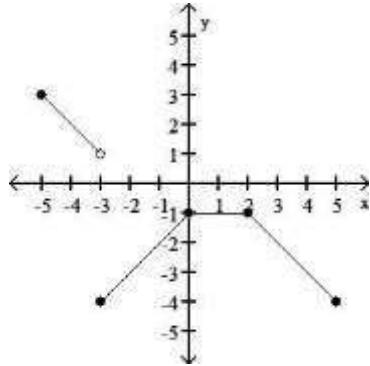
A) Increasing on (-3, -1); Decreasing on (-5, -2) and (2, 4); Constant on (-1, 2)
B) Increasing on (-3, 0); Decreasing on (-5, -3) and (2, 5); Constant on (0, 2)
C) Increasing on (-3, 1); Decreasing on (-5, -3) and (0, 5); Constant on (1, 2)
D) Increasing on (-5, -3) and (2, 5); Decreasing on (-3, 0); Constant on (0, 2)

Determine the domain and range of the function.

6)

6) _____
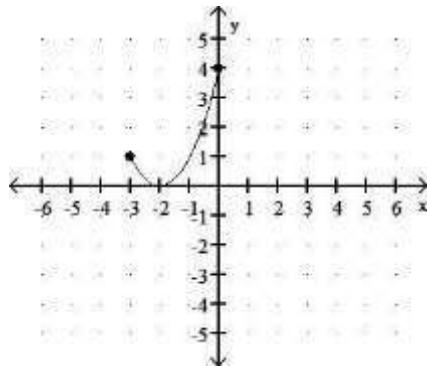
A) domain: [0, 4];   range: [-3, 0]   B) domain: [0, 3];   range: (-∞, 4]
C) domain: [-3, 0];   range: [0, 4]   D) domain: (-∞, 4];   range: [0, 3]

7)
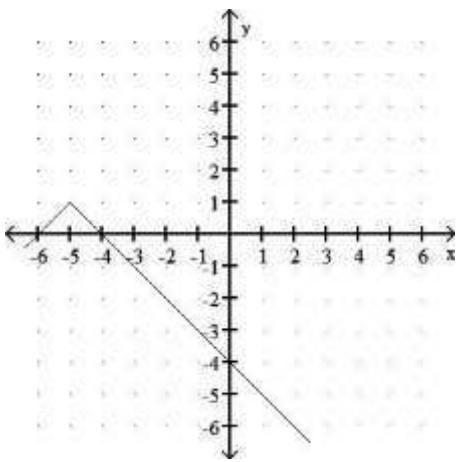
A) domain: (-∞, -5]; range: (-∞, 1]
B) domain: (-∞, -5) U (-5, ∞); range: (-∞, 1) U (1, ∞)
C) domain: (-∞, ∞); range: (-∞, ∞)
D) domain: (-∞, ∞); range: (-∞, 1]

8)
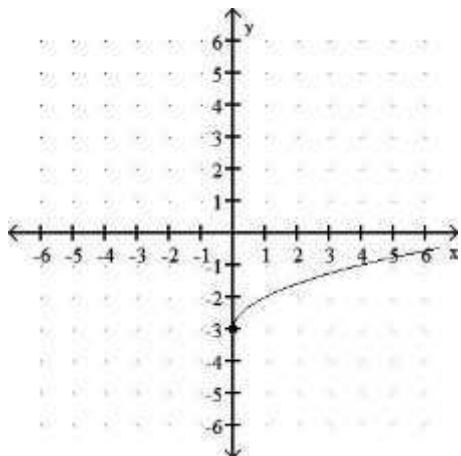
A) domain: (-∞, ∞);   range: [-3, ∞)   B) domain: [0, ∞); range: [0, ∞)
C) domain: [0, ∞);   range: [-3, ∞)   D) domain: [0, ∞); range: (-∞, ∞)

9)
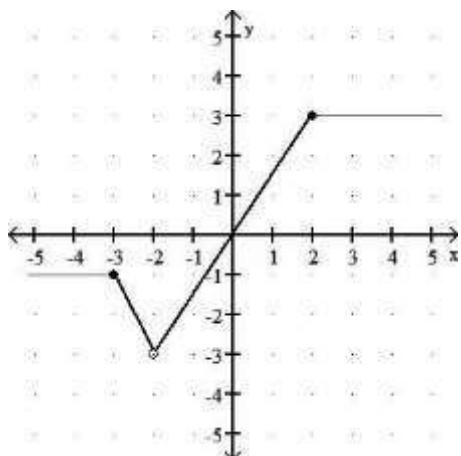
A) domain: (-∞, ∞);   range: [-3, 3]   B) domain: (-3, 3];   range: (-∞, ∞)
C) domain: (-∞, ∞);   range: [-3, 3)   D) domain: (-∞, ∞);   range: (-3, 3]

10)

10)
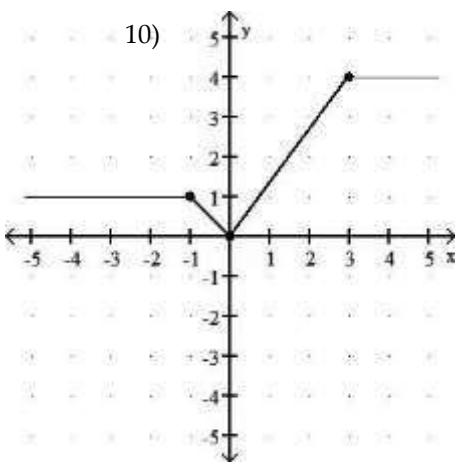
A) domain: $(-\infty, \infty)$; range: $[0, 4]$
C) domain: $[0, 4]$; range: $(-\infty, \infty)$

B) domain: $(0, 4)$; range: $(-\infty, \infty)$
D) domain: $(-\infty, \infty)$; range: $(0, 4)$

11)
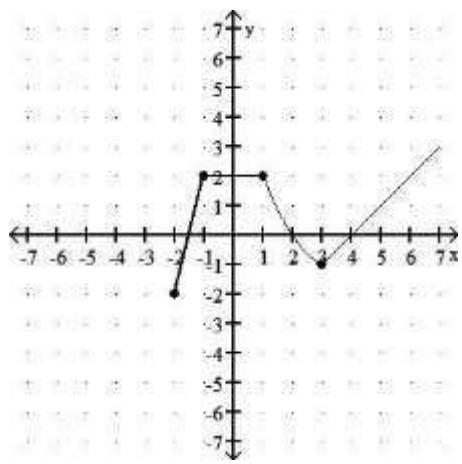

A) domain: $(-2, \infty)$; range: $(-2, \infty)$
C) domain: $[-2, \infty)$; range: $[-2, \infty)$

B) domain: $[-2, \infty)$; range: $[-2, 2]$
D) domain: $[-2, 2]$; range: $[-2, \infty)$

11) _____

12)
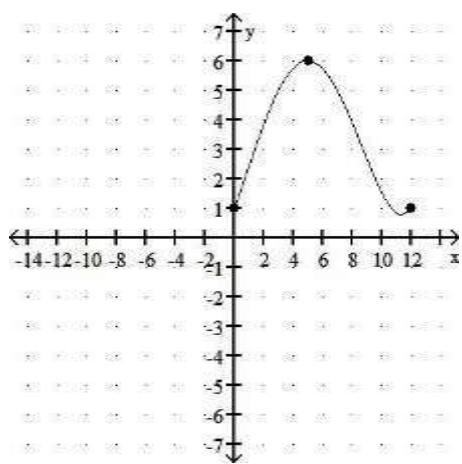
A) domain: $(0, 12)$; range: $(1, 6)$
C) domain: $(1, 6)$; range: $(0, 12)$

B) domain: $[1, 6]$; range: $[0, 12]$
D) domain: $[0, 12]$; range: $[1, 6]$

12) _____

Using the graph, determine any relative maxima or minima of the function and the intervals on which the function is increasing or decreasing. Round to three decimal places when necessary.

13) $f(x) = x^2 - 6x + 7$

13)
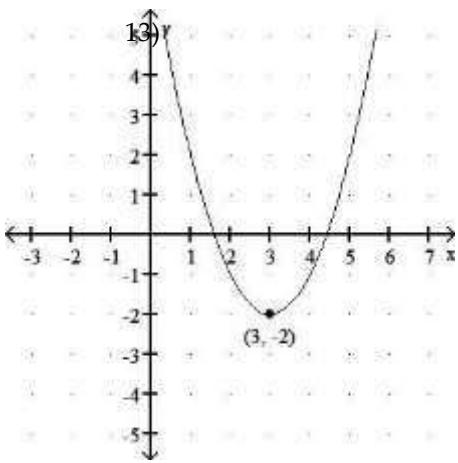
A) relative maximum: -2 at x = 3; increasing (3, ∞); decreasing (-∞, 3)
B) relative minimum: 3 at y = -2; increasing (-∞, 3); decreasing (3, ∞)
C) relative maximum: 3 at y = -2; increasing (-∞, 3); decreasing (3, ∞)
D) relative minimum: -2 at x = 3; increasing (3, ∞); decreasing (-∞, 3)

14) $f(x) = x^3 - 3x^2 + 1$

14) _____
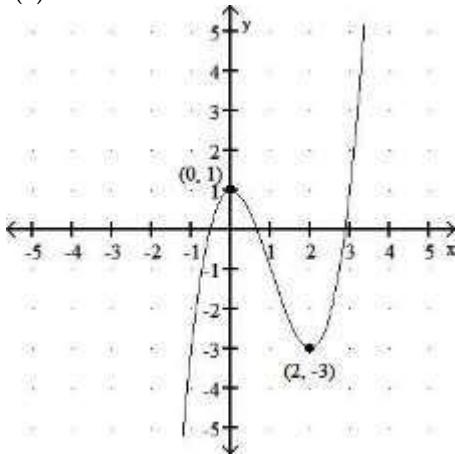
A) relative maximum: 1 at x = 0; relative minimum: -3 at x = 2; increasing $(-\infty, 0), (2, \infty)$; decreasing $(0, 2)$

B) relative maximum: -3 at x = 2; relative minimum: 1 at x = 0; increasing (0, 2); decreasing $(-\infty, 0), (2, \infty)$

C) no relative maxima; relative minimum: -3 at x = 2; increasing $(-\infty, 0), (2, \infty)$; decreasing (0, 2)

D) relative maximum: 1 at x = 0; no relative minima; increasing $(-\infty, 0), (2, \infty)$; decreasing (0, 2)

15) $f(x) = x^3 - 12x + 2$

(15)(18)
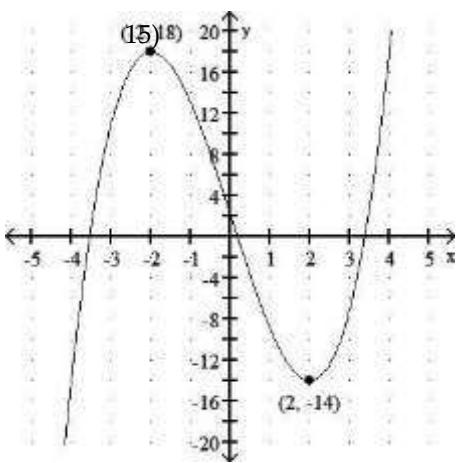
A) relative maximum: 18 at x = -2; relative minimum: -14 at x = 2; increasing $(-\infty, -2), (2, \infty)$; decreasing $(-2, 2)$

B) relative maxima: 18 at x = -2 and 0 at x = 0; relative minimum: -14 at x = 2; increasing $(-\infty, -2), (2, \infty)$; decreasing $(-2, 2)$

C) no relative maxima or minima; increasing $(-\infty, -2), (2, \infty)$; decreasing $(-2, 2)$

D) relative maximum: -14 at x = 2; relative minimum: 18 at x = -2; increasing $(-2, 2)$; decreasing $(-\infty, -2), (2, \infty)$

16) $f(x) = \frac{1}{2}x^3 + \frac{1}{2}x^2 - x + 1$ 16) _____
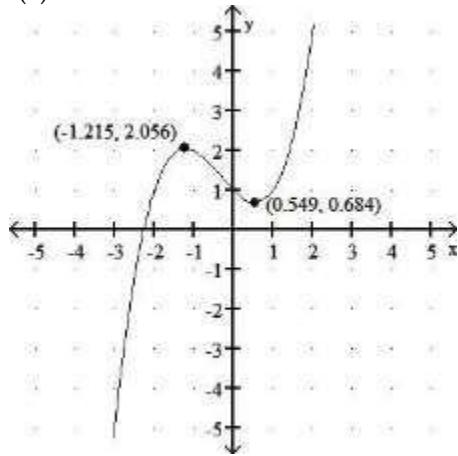
A) no relative maxima or minima; increasing $(-\infty, -1.215), (0.549, \infty)$; decreasing $(-1.215, 0.549)$

B) relative maximum: 0.684 at x = 0.549; relative minimum: 2.056 at x = -1.215; increasing $(-1.215, 0.549)$ decreasing $(-\infty, -1.215), (0.549, \infty)$

C) relative maximum: 2.056 at x = -1.215; relative minima: 0.684 at x = 0.549 and 1 at x = 0; increasing $(-1.215, 0.549)$ decreasing $(-\infty, -1.215), (0.549, \infty)$

D) relative maximum: 2.056 at x = -1.215; relative minimum: 0.684 at x = 0.549; increasing $(-\infty, -1.215), (0.549, \infty)$; decreasing $(-1.215, 0.549)$

17) $f(x) = -0.06x^3 - 0.3x^2 + 0.1x + 3$

17)

(0.159, 3.008)

(-3.492, 1.547)
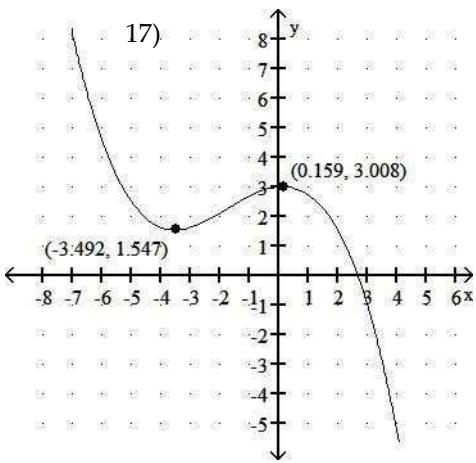
A) relative maxima: 3 at x = 0 and 3.008 at x = 0.159; relative minimum: 1.547 at x = -3.492; increasing $(-\infty, -3.492), (0.159, \infty)$; decreasing $(-3.492, 0.159)$

B) relative maximum: 1.547 at x = -3.492; relative minimum: 3.008 at x = 0.159; increasing $(-3.492, 0.159)$ decreasing $(-\infty, -3.492), (0.159, \infty)$

C) relative maximum: 3.008 at x = 0.159; relative minimum: 1.547 at x = -3.492; increasing $(-3.492, 0.159)$ decreasing $(-\infty, -3.492), (0.159, \infty)$

D) no relative maxima or minima; increasing $(-\infty, -3.492), (0.159, \infty)$; decreasing $(-3.492, 0.159)$

Graph the function. Use the graph to find any relative maxima or minima.

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

18) _____
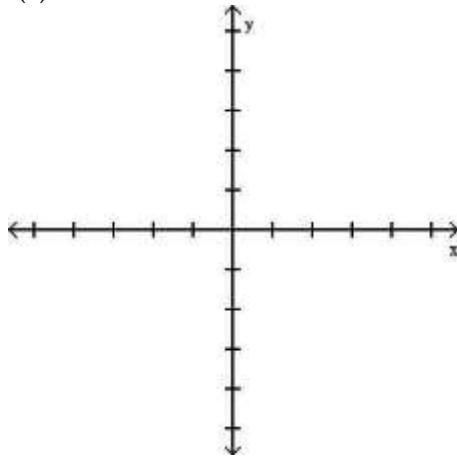
A) No relative extrema   B) Relative minimum of - 4 at x = 1
C) Relative minimum of - 4 at x = 0   D) Relative maximum of - 4 at x = 0

19) $f(x) = -x^2 + 3$

19)
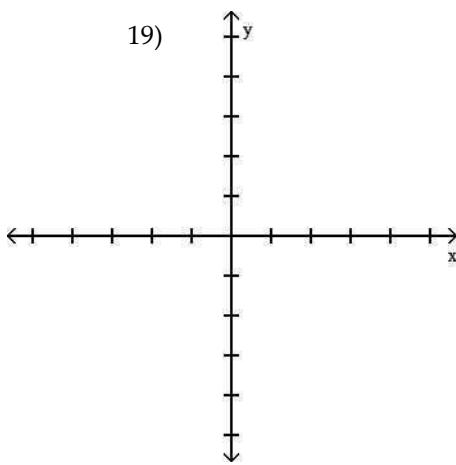
A) Relative maximum of 3 at x = 0 and relative minimum at x = 3
B) Relative maximum of 3 at x = 0
C) No relative extrema
D) Relative minimum of 3 at x = 0

20) $f(x) = -x^2 + 8x - 15$
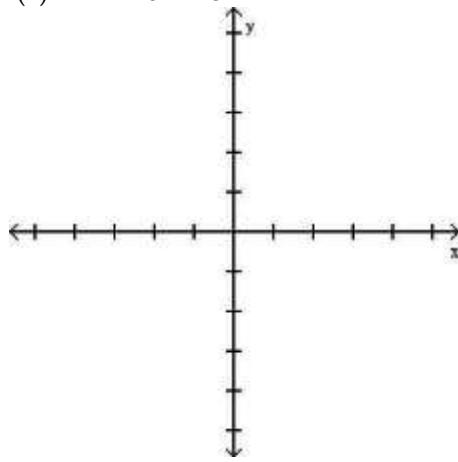
20) _____

A) Relative minimum of 1 at x = 4   B) Relative maximum of 4 at x = 1
C) Relative maximum of 1 at x = 4   D) No relative extrema

21) $f(x) = x^2 + 8x + 14$
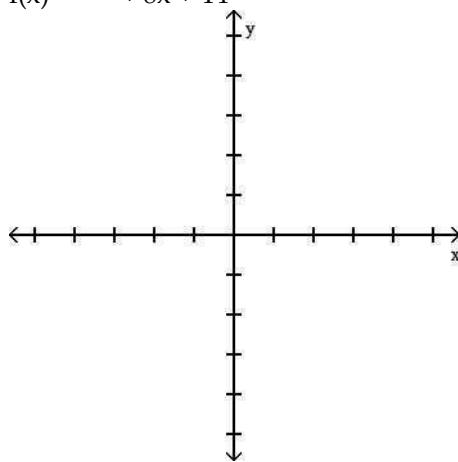
21) _____

A) Relative minimum of - 2 at x = - 4   B) Relative maximum of - 2.2 at x = - 4.1
C) Relative maximum of - 2 at x = - 4   D) Relative minimum of - 2.2 at x = - 4.1

22) $f(x) = 2 - |x|$

22) _____
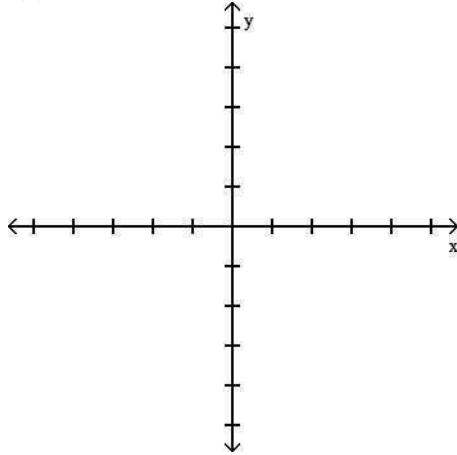
A) Relative maximum of 2 at x = 0

B) No relative extrema

C) Relative maximum of 2.5 at x = 0

D) Relative minimum of 2 at x = 0

23) $f(x) = |x + 4| - 1$

23) _____
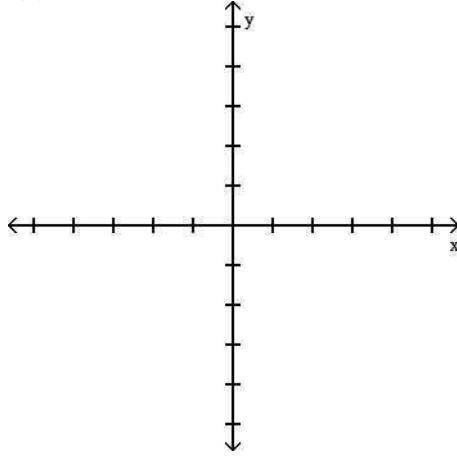
A) Relative maximum of 1 at x = - 4

B) Relative minimum of 0.7 at x = - 4

C) Relative minimum of - 1 at x = - 4

D) Relative minimum of 1.2 at x = - 4

Solve.

24) Elissa wants to set up a rectangular dog run in her backyard. She has 36 feet of fencing to work with and wants to use it all. If the dog run is to be x feet long, express the area of the dog run as a function of x.

24) _____

A) $A(x) = 20x^2 - x$

B) $A(x) = 19x - x^2$

C) $A(x) = 17x - x^2$

D) $A(x) = 18x - x^2$

25) Bob wants to fence in a rectangular garden in his yard. He has 74 feet of fencing to work with and wants to use it all. If the garden is to be x feet wide, express the area of the garden as a function of x.

25) _____

A) $A(x) = 39x^2 - x$

B) $A(x) = 38x - x^2$

C) $A(x) = 37x - x^2$

D) $A(x) = 36x - x^2$

26) A rocket is shot straight up in the air from the ground at a rate of 67 feet per second. The rocket is tracked by a rangefinder that is 430 feet from the launch pad. Let d represent the distance from the rocket to the rangefinder and t represent the time, in seconds, since "blastoff". Express d as a function of t.

26) _____

A) $d(t) = 430 + 67t^2$

B) $d(t) = \sqrt{430^2 + (67t)^2}$

C) $d(t) = \sqrt{67^2 + (430t)^2}$

D) $d(t) = 430^2 + (67t)^2$

27) Sue wants to put a rectangular garden on her property using 66 meters of fencing. There is a 27) _____
river that runs through her property so she decides to increase the size of the garden by using
the river as one side of the rectangle. (Fencing is then needed only on the other three sides.) Let x
represent the length of the side of the rectangle along the river. Express the garden's area as a
function of x.

A) $A(x) = 33x - \frac{1}{2}x^2$

B) $A(x) = 34x - 2x^2$

C) $A(x) = 32x - \frac{1}{4}x^2$

D) $A(x) = 33x^2 - x$

28) A farmer's silo is the shape of a cylinder with a hemisphere as the roof. If the height of the silo is 28) _____
118 feet and the radius of the hemisphere is r feet, express the volume of the silo as a function of
r.

A) $V(r) = \pi(118 - r)r^3 + \frac{4}{3}\pi r^2$

B) $V(r) = 118\pi r^2 + \frac{8}{3}\pi r^3$

C) $V(r) = \pi(118 - r) + \frac{4}{3}\pi r^2$

D) $V(r) = \pi(118 - r)r^2 + \frac{2}{3}\pi r^3$

29) A farmer's silo is the shape of a cylinder with a hemisphere as the roof. If the radius of the 29) _____
hemisphere is 10 feet and the height of the silo is h feet, express the volume of the silo as a
function of h.

A) $V(h) = 100 \pi h + \frac{4000}{3}\pi h^2$

B) $V(h) = 100 \pi(h - 10) + \frac{2000}{3}\pi$

C) $V(h) = 100 \pi(h^2 - 10) + \frac{5000}{\pi}$

D) $V(h) = 4100 \pi(h - 10) + \frac{500}{7}\pi$

30) A rectangular sign is being designed so that the length of its base, in feet, is 6 feet less than 4 30) _____
times the height, h. Express the area of the sign as a function of h.

A) $A(h) = 6h - 2h^2$

B) $A(h) = -6h + 4h^2$

C) $A(h) = -6h + h^2$

D) $A(h) = -6h^2 + 2h$

31) From a 16-inch by 16-inch piece of metal, squares are cut out of the four corners so that the sides 31) _____
can then be folded up to make a box. Let x represent the length of the sides of the squares, in
inches, that are cut out. Express the volume of the box as a function of x.

A) $V(x) = 2x^3 - 48x^2 + 16x$

B) $V(x) = 4x^3 - 64x^2$

C) $V(x) = 4x^3 - 64x^2 + 256x$

D) $V(x) = 2x^3 - 48x^2$

32) A rectangular box with volume 400 cubic feet is built with a square base and top. The cost is 32) _____
$1.50 per square foot for the top and the bottom and $2.00 per square foot for the sides. Let x
represent the length of a side of the base. Express the cost the box as a function of x.

A) $C(x) = 3x^2 + \frac{1600}{x}$

B) $C(x) = 3 + \frac{3200}{x^2}$

C) $x^2 \frac{3200}{x}$

B)

C(x) = 4x +

D)

$$C(x) = 2^{x^2} + \frac{3200}{}$$

33) A rectangle that is x feet wide is inscribed in a circle of radius 21 feet. Express the area of the rectangle as a function of x.

A) $A(x) = x\sqrt{1764 - x^2}$

B) $A(x) = x(1764 - x^2)$

33) _____

C) $A(x) = x^2\sqrt{882 - x^2}$ 　　　　　　　　　　D) $A(x) = x\sqrt{1323 - x}$

34) From a 15-inch by 15-inch piece of metal, squares are cut out of the four corners so that the sides can then be folded up to make a box. Let x represent the length of the sides of the squares, in inches, that are cut out. Express the volume of the box as a function of x. Graph the function and from the graph determine the value of x, to the nearest tenth of an inch, that will yield the maximum volume.

34) _____

   A) 3.1 inches　　　　　　B) 2.3 inches　　　　　　C) 2.5 inches　　　　　　D) 2.8 inches

35) From a 24-inch by 24-inch piece of metal, squares are cut out of the four corners so that the sides can then be folded up to make a box. Let x represent the length of the sides of the squares, in inches, that are cut out. Express the volume of the box as a function of x. Graph the function and from the graph determine the value of x, to the nearest tenth of an inch, that will yield the maximum volume.

35) _____

    A) 3.8 inches　　　　　　B) 3.7 inches　　　　　　C) 4.1 inches　　　　　　D) 4.0 inches

36) A rectangular box with volume 468 cubic feet is built with a square base and top. The cost is $1.50 per square foot for the top and the bottom and $2.00 per square foot for the sides. Let x represent the length of a side of the base in feet. Express the cost of the box as a function of x and then graph this function. From the graph find the value of x, to the nearest hundredth of a foot, which will minimize the cost of the box.

36) _____

    A) 8.55 feet　　　　　　B) 8.44 feet　　　　　　C) 8.63 feet　　　　　　D) 7.92 feet

37) A rectangular box with volume 517 cubic feet is built with a square base and top. The cost is $1.50 per square foot for the top and the bottom and $2.00 per square foot for the sides. Let x represent the length of a side of the base in feet. Express the cost of the box as a function of x and then graph this function. From the graph find the value of x, to the nearest hundredth of a foot, which will minimize the cost of the box.

37) _____

    A) 8.49 feet　　　　　　B) 8.83 feet　　　　　　C) 8.91 feet　　　　　　D) 8.79 feet

38) A rectangle that is x feet wide is inscribed in a circle of radius 20 feet. Express the area of the rectangle as a function of x. Graph the function and from the graph determine the value of x, to the nearest tenth of a foot, which will maximize the area of the rectangle.

38) _____

    A) 28.3 feet　　　　　　B) 29.1 feet　　　　　　C) 27.9 feet　　　　　　D) 28.7 feet

39) A rectangle that is x feet wide is inscribed in a circle of radius 32 feet. Express the area of the rectangle as a function of x. Graph the function and from the graph determine the value of x, to the nearest tenth of a foot, which will maximize the area of the rectangle.

39) _____

    A) 44.9 feet　　　　　　B) 44.5 feet　　　　　　C) 45.7 feet　　　　　　D) 45.3 feet

40) Elissa sells two breeds of dogs, Alaskan Malamutes and Great Pyrenees. She has 108 feet of fencing to enclose two adjacent rectangular dog kennels, one for each breed. An existing fence is to form one side of the kennels, as in the drawing below. Suppose the total length of the two kennels is x feet. Express the total area of the two kennels as a function of x. Graph the function and from the graph determine the value of x that will yield the maximum area.

40)

Existing Fence →

Alaskan Malamutes

Great Pyrenees

x
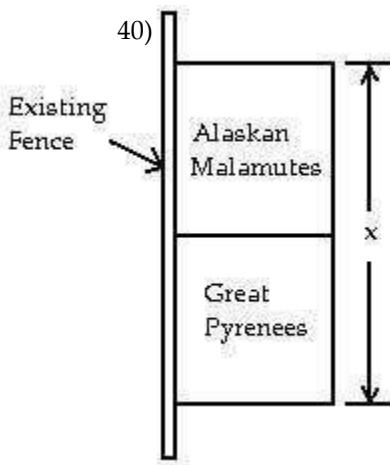
A) 56 feet   B) 54 feet   C) $54\frac{1}{2}$ feet   D) 53 feet

41) Elissa sells two breeds of dogs, Alaskan Malamutes and Great Pyrenees. She has 78 feet of fencing to enclose two adjacent rectangular dog kennels, one for each breed. An existing fence is to form one side of the kennels, as in the drawing below. Let x represent the measurement indicated. Express the total area of the two kennels as a function of x. Graph the function and from the graph determine the value of x, rounded to the hundredths place, that will yield the maximum area.

x

Existing Fence →

Alaskan Malamutes

Great Pyrenees
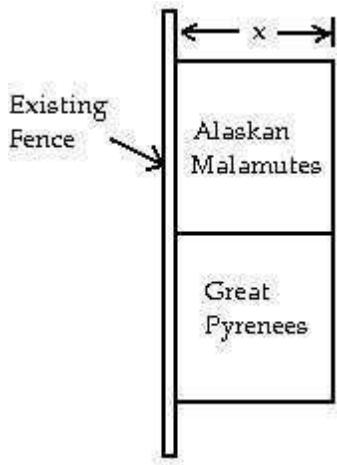
A) 13.00 feet   B) 13.17 feet   C) 13.33 feet   D) 19.50 feet

For the piecewise function, find the specified function value.

42) $f(x) = \begin{cases} 6x, & \text{for } x \le -1, \\ x - 5, & \text{for } x > -1 \end{cases}$

f(-7)

A) - 12   B) 2   C) 42   D) - 42

43) $f(x) = \begin{cases} x - 5, & \text{for } x < 5, \\ 7 - x, & \text{for } x \ge 5 \end{cases}$

f(0)

A) 0   B) 2   C) - 5   D) 7

44) $f(x) = \begin{cases} 5x + 6, & \text{for } x \le 0, \\ 4 - 4x, & \text{for } 0 < x < 4, \\ x, & \text{for } x \ge 4 \end{cases}$

A) -16   B) 5   C) 4   D) 31

45)
$$f(x) = \begin{cases} 6x + 1, & \text{for } x < 1, \\ 3x, & \text{for } 3 \le x \le 7, \\ 3 - 5x, & \text{for } x > 7 \end{cases}$$
f(3)

45) _____

A) 36   B) 9   C) -12   D) 7

46)
$$f(x) = \begin{cases} 5x + 1, & \text{for } x < 7, \\ 7x, & \text{for } 7 \le x \le 12, \\ 7 - 3x, & \text{for } x > 12 \end{cases}$$
f(-7)

46) _____

A) 28   B) - 20   C) 22   D) - 49

Graph the function.

47)
$$f(x) = \begin{cases} 5, & \text{for } x \ge 1, \\ -1 - x, & \text{for } x < 1 \end{cases}$$

47) _____

A)

B)

C)
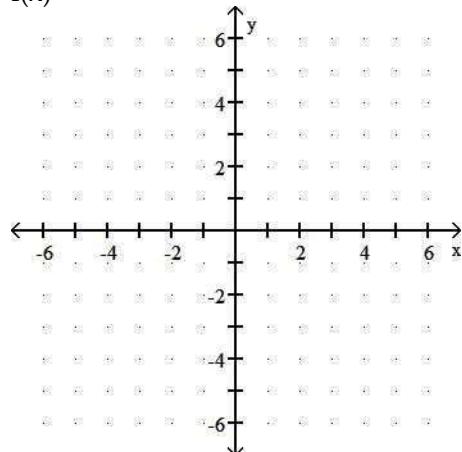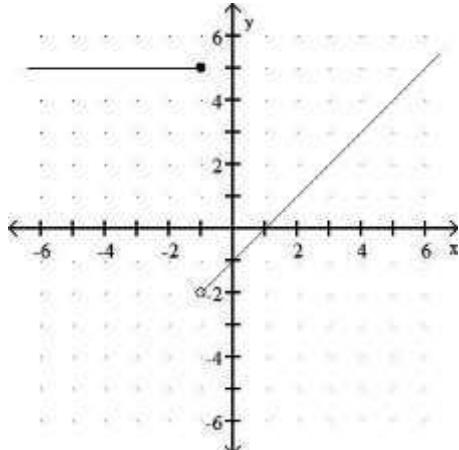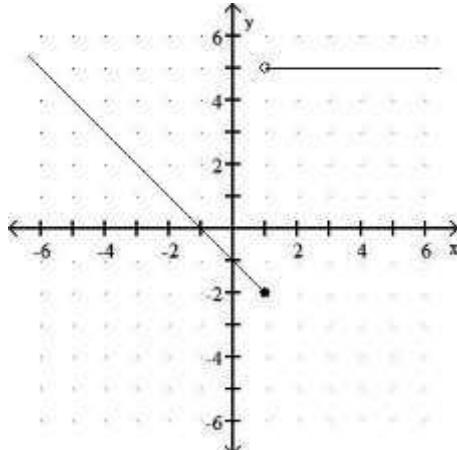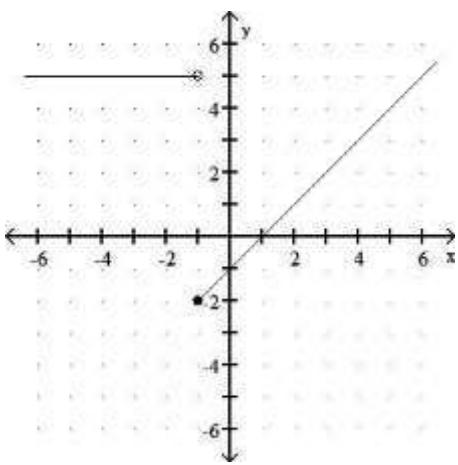
D)
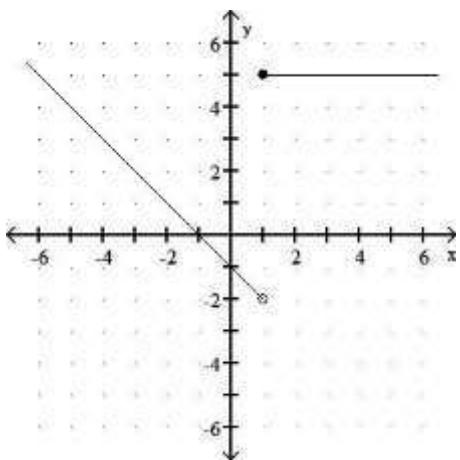
48) $f(x) = \begin{cases} x - 5, & \text{for } x > 0, \\ -3, & \text{for } x \le 0 \end{cases}$

48) _____

A)

B)

C)
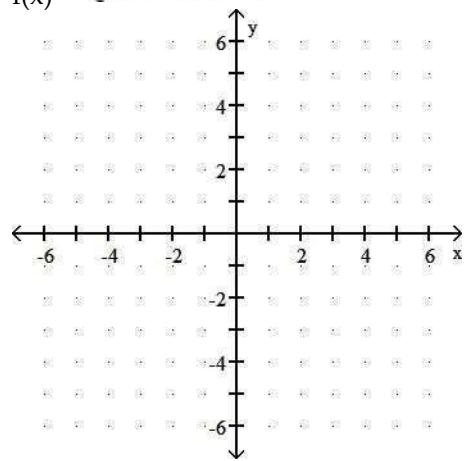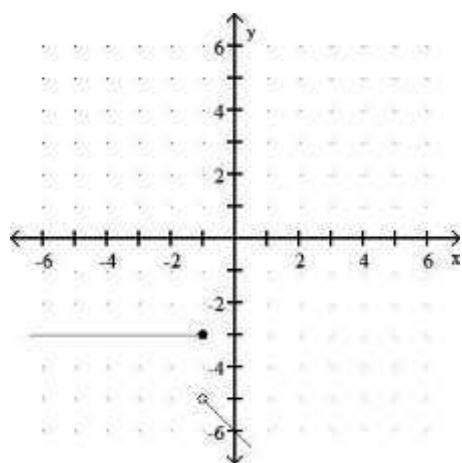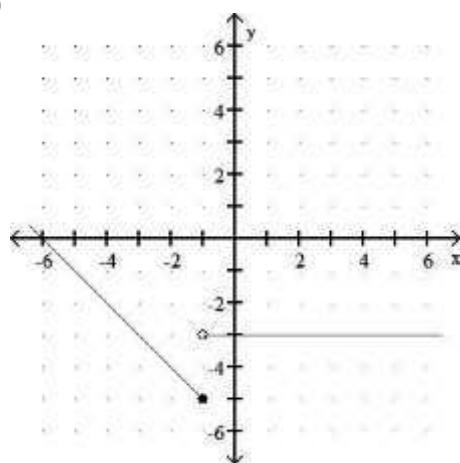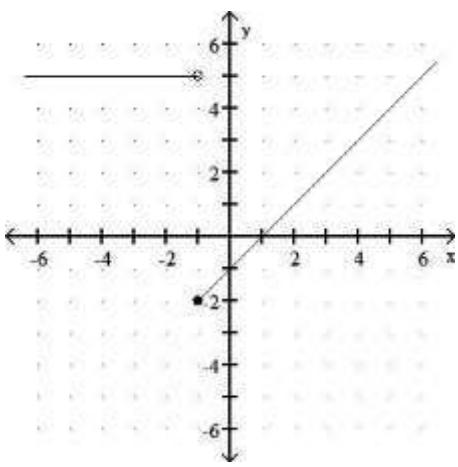
D)
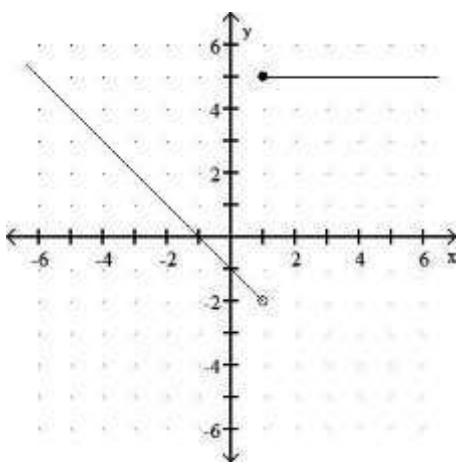
49) $f(x) = \begin{cases} 3 - x, & \text{for } x \le 2, \\ 1 + 2x, & \text{for } x > 2 \end{cases}$

49) _____

A)

B)

C)
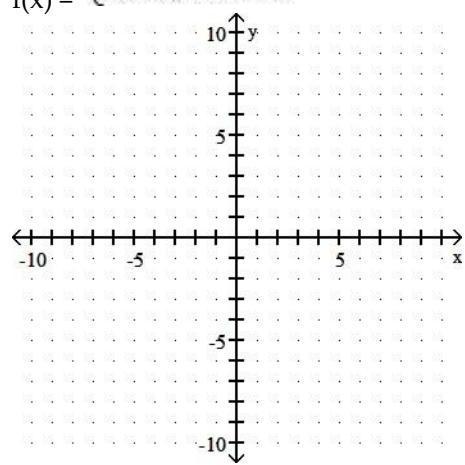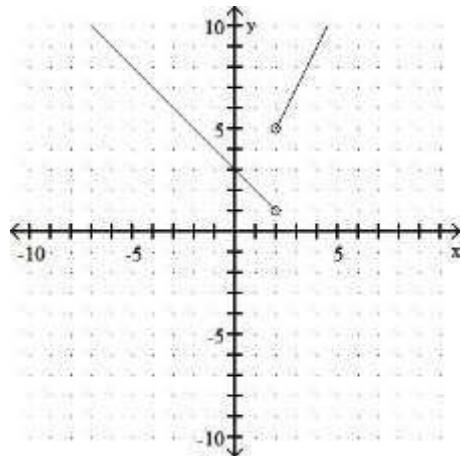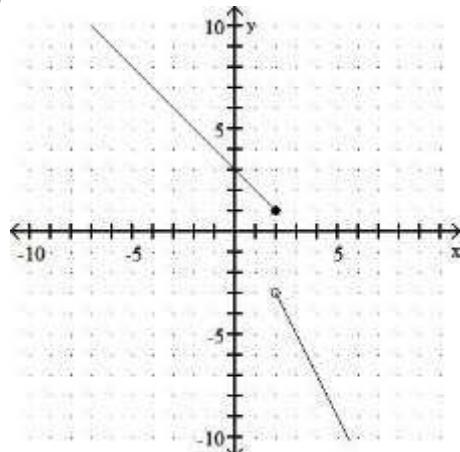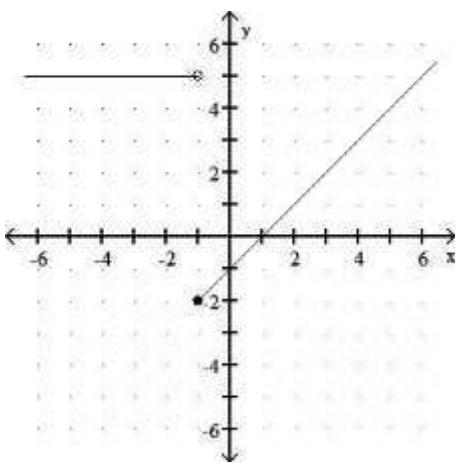
D)
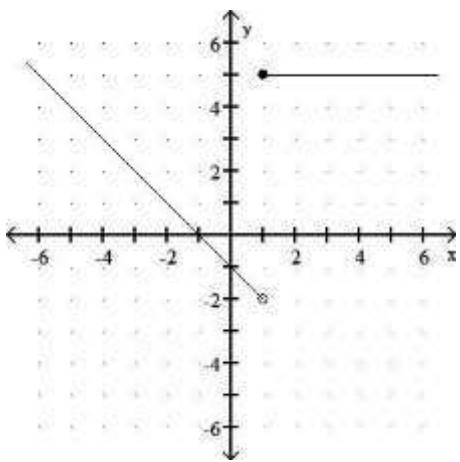
50)
$$f(x) = \begin{cases} x+2 & \text{for } -7 \le x < 3 \\ -9 & \text{for } x = 3 \\ -x+5 & \text{for } x > 3 \end{cases}$$

50) _____

A)

B)

C)
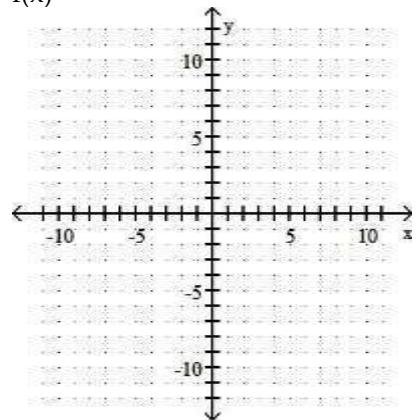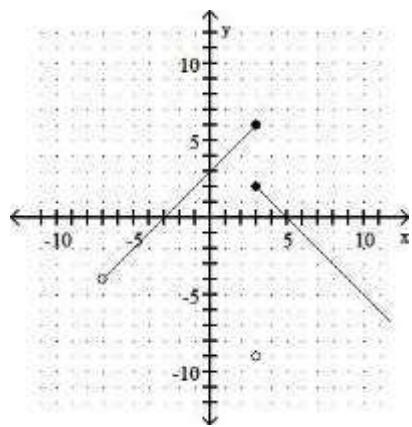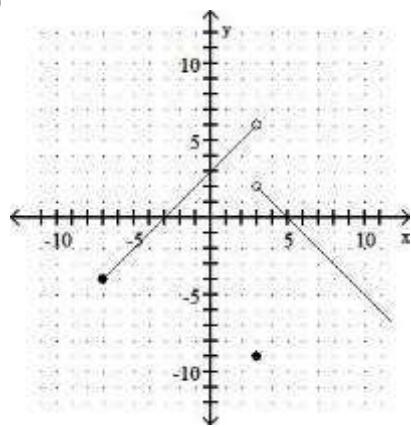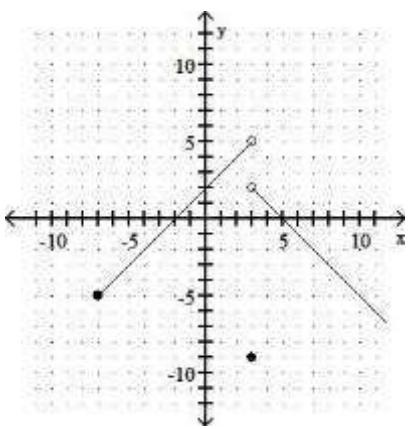
D)
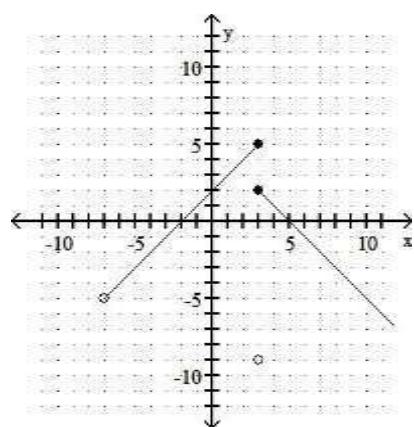
51)

$$f(x) = \begin{cases} 5x + 2 & \text{for } x < -2 \\ x & \text{for } -2 \le x \le 3 \\ 4x - 1 & \text{for } x > 3 \end{cases}$$

A)

B)

C)
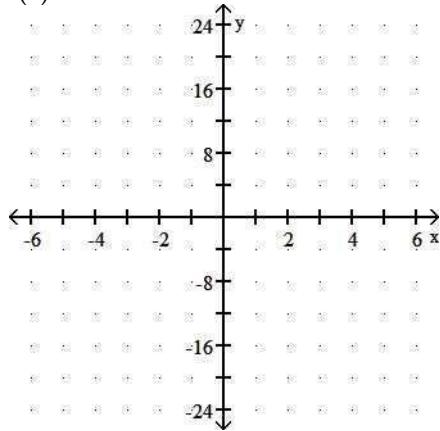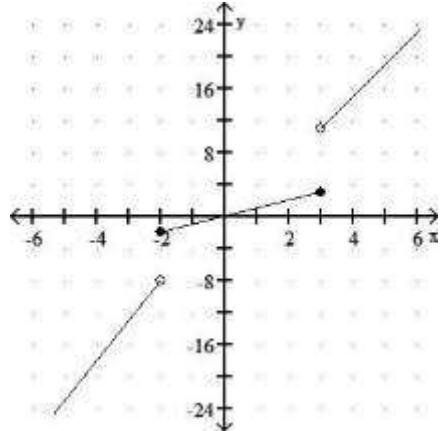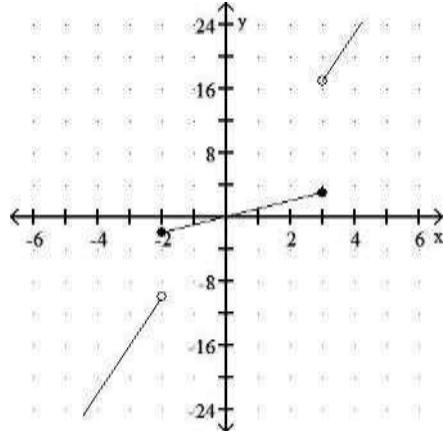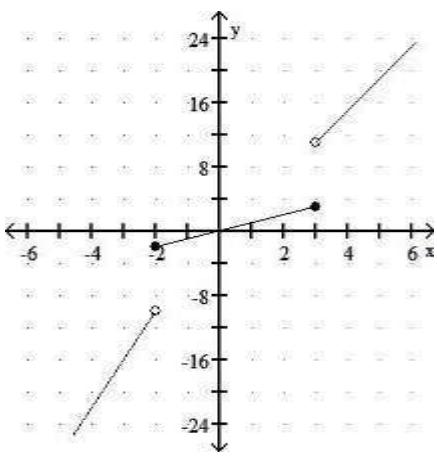
D)
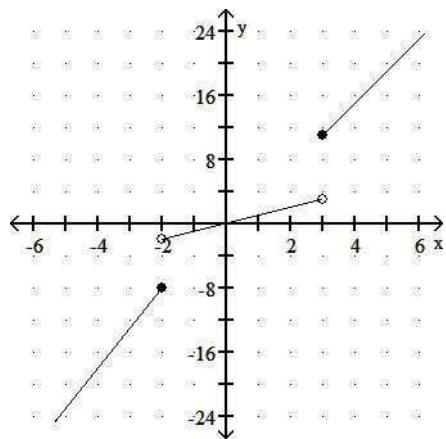
52)

$$f(x) = \begin{cases} \dfrac{1}{x+3}, & \text{for } x \neq -3, \\ 2, & \text{for } x = -3 \end{cases}$$

52) _____

A)

B)

C)
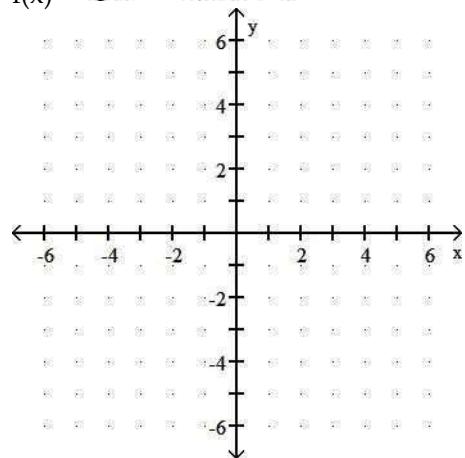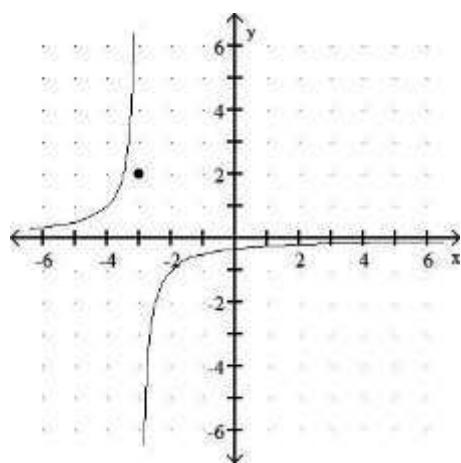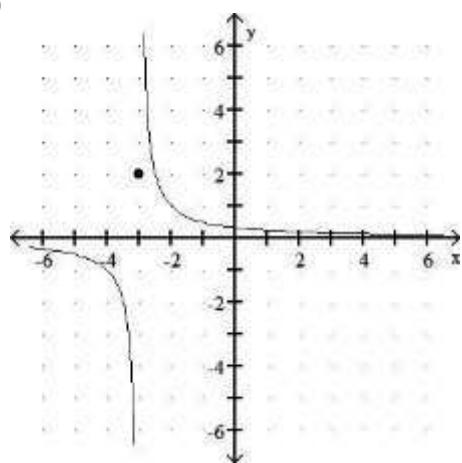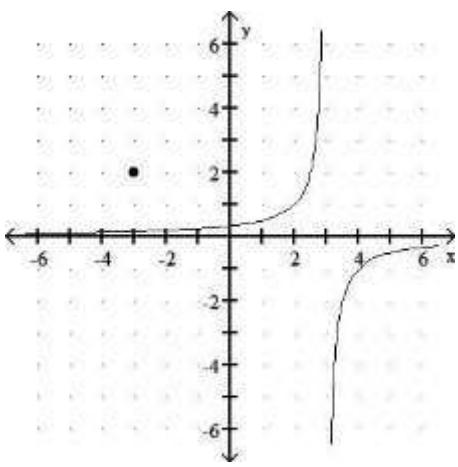
D)
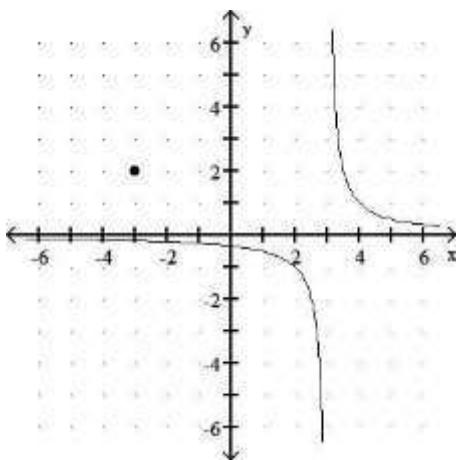
53)

$$f(x) = \begin{cases} \dfrac{x^2 - 1}{x + 1}, & \text{for } x \neq -1, \\ 2, & \text{for } x = -1 \end{cases}$$

53) _____

A)

B)

C)
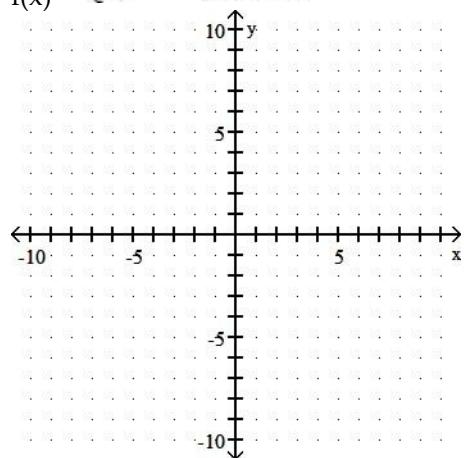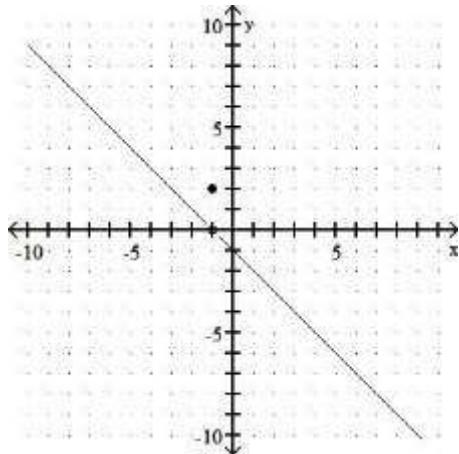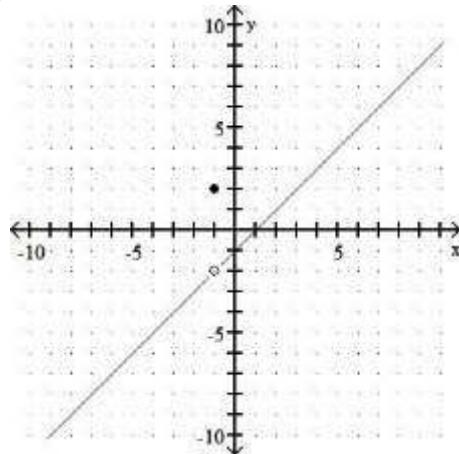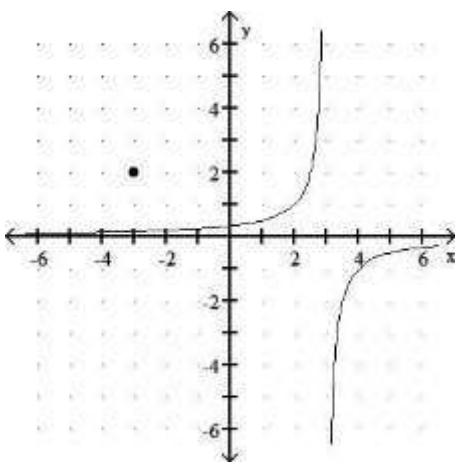
D)
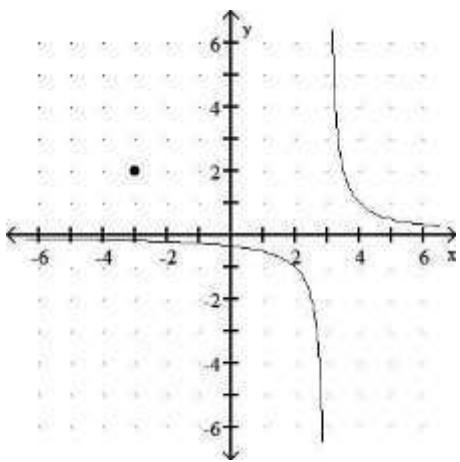
54)

$$f(x) = \begin{cases} \dfrac{x^2 - 4}{x - 2}, & \text{for } x \neq -2, \\ -9, & \text{for } x = 2 \end{cases}$$

54) _____

A)

B)

C)
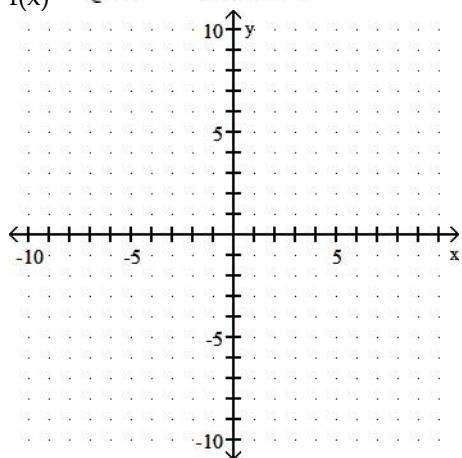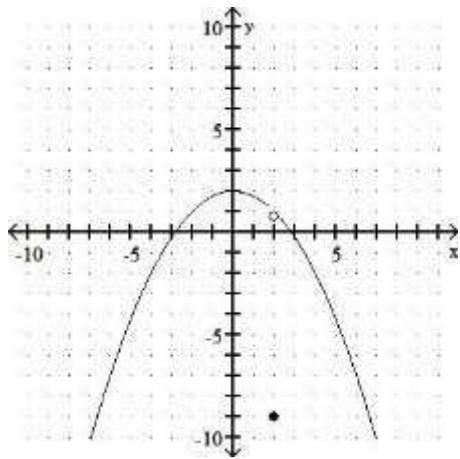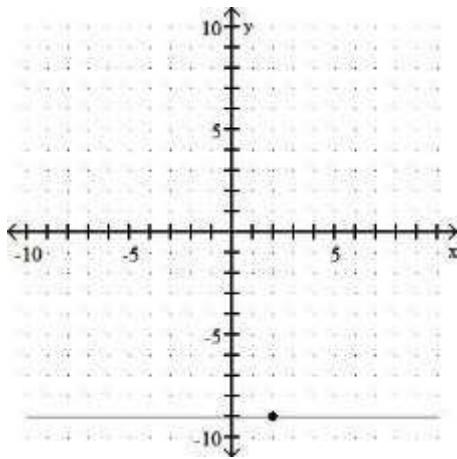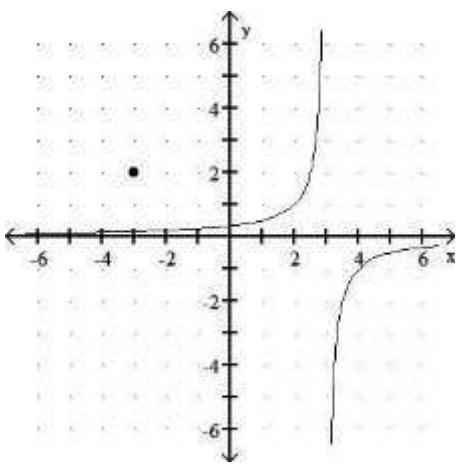
D)
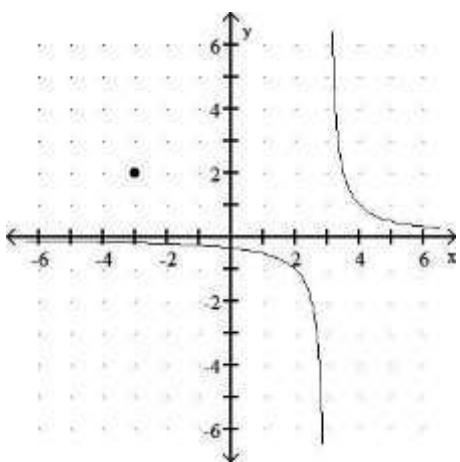
55)
$$f(x) = \begin{cases} \dfrac{x^2 + 8x + 12}{x + 2}, & \text{for } x \neq -2, \\ -7, & \text{for } x = -2 \end{cases}$$

55) _____

A)

B)

C)
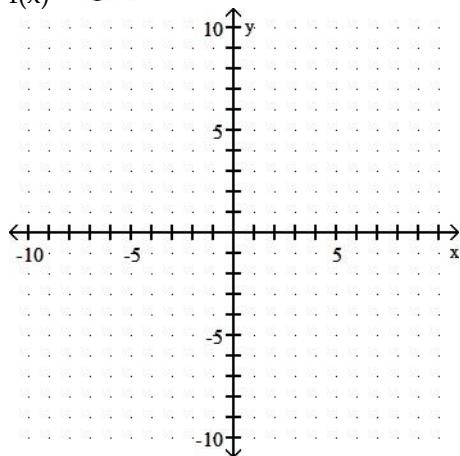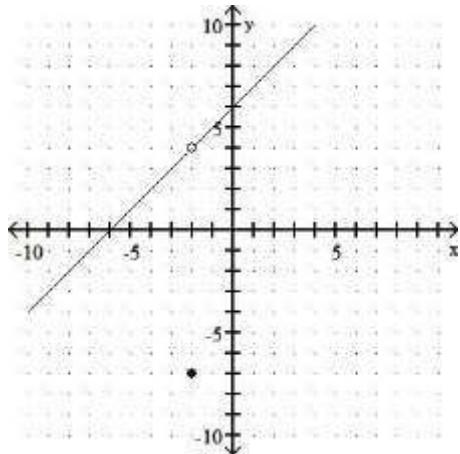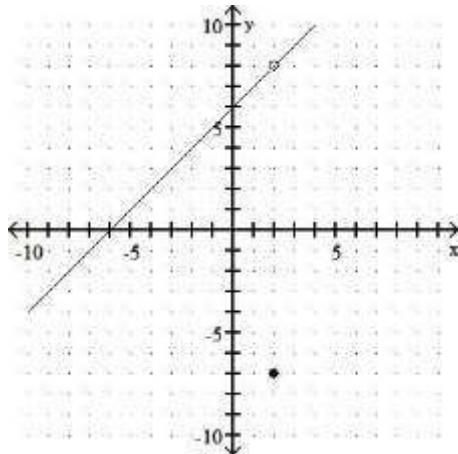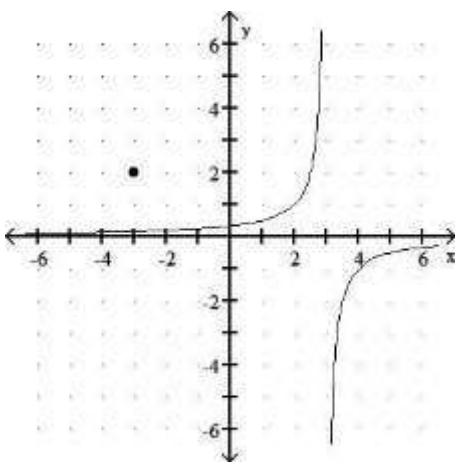
D)
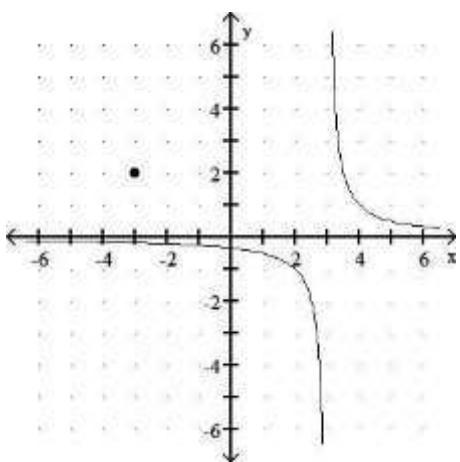
Graph the equation.

56) $y = [\![x]\!]$
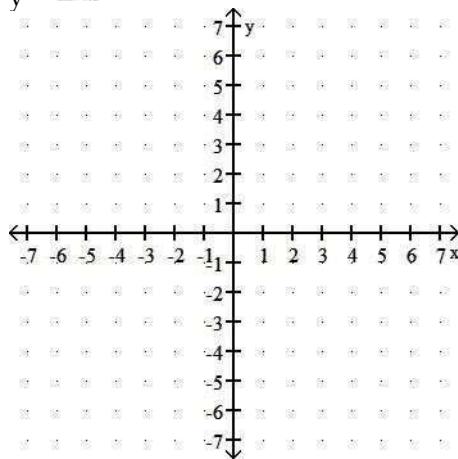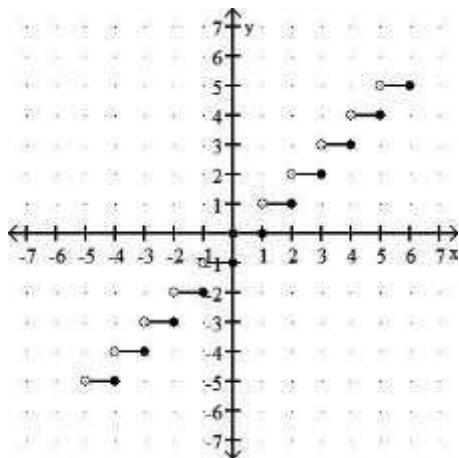
56) _____

A)

B)

C)

D)

57) $y = \dfrac{1}{2} [\![x]\!]$

A)

B)

C)

D)

58) $y = 3 \llbracket x \rrbracket$ 58) _____

A)

B)

C)

D)

59) $y = 2 [\![x]\!]$

59) _____

A)

B)

C)

D)

60) $y = 3 + [\![x]\!]$

60) _____

A)

B)

C)

D)

61) $y = \dfrac{1}{2} [\![x]\!] - 4$

61) _____

A)

B)

C)
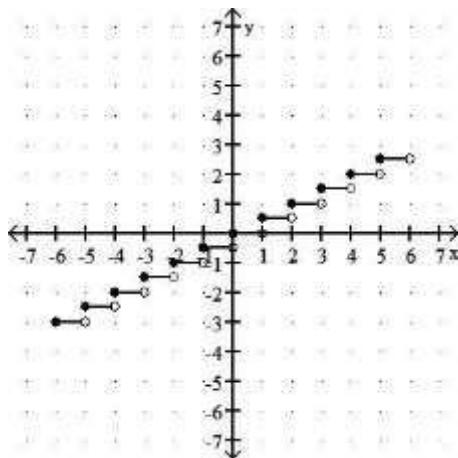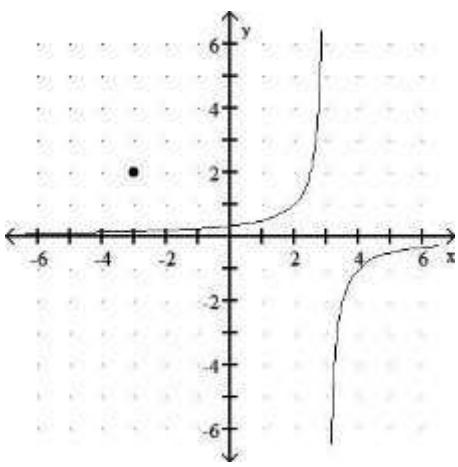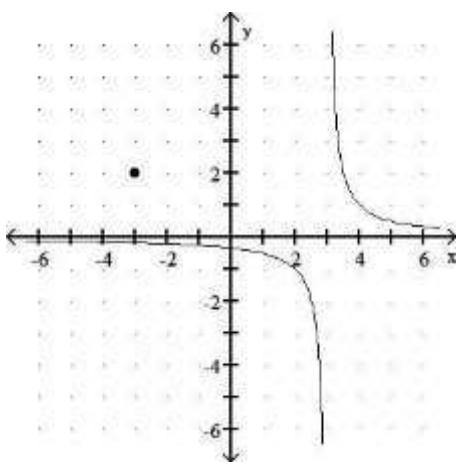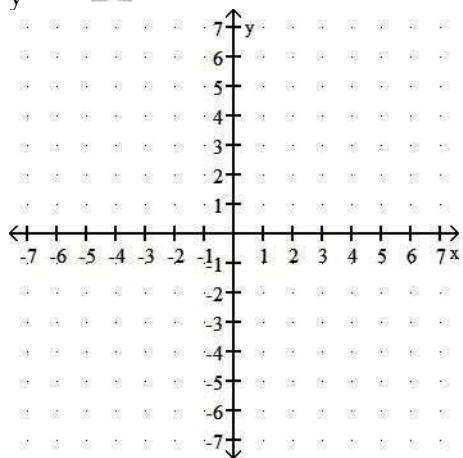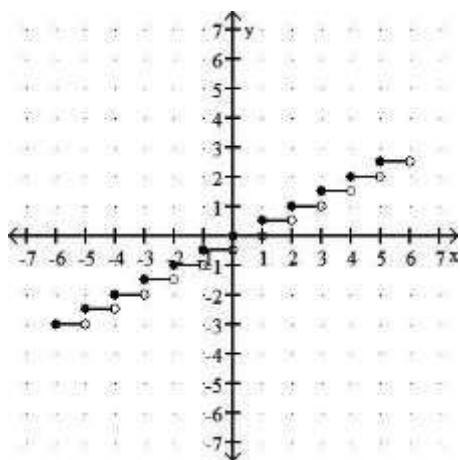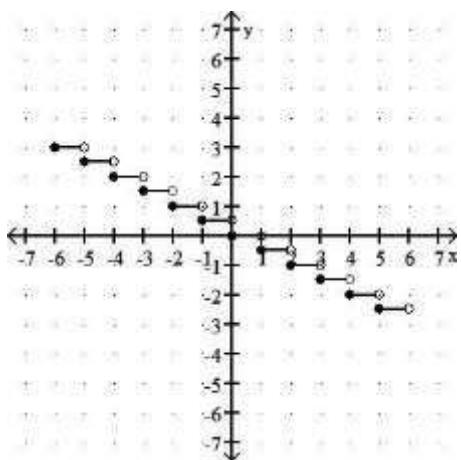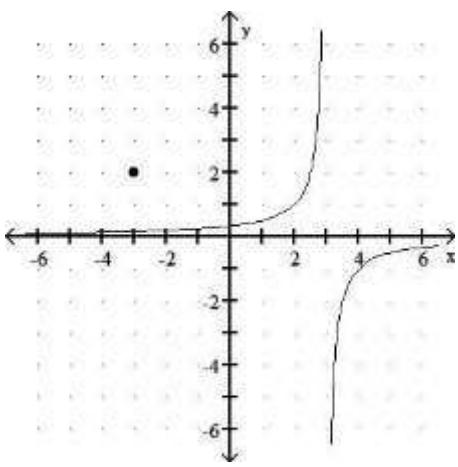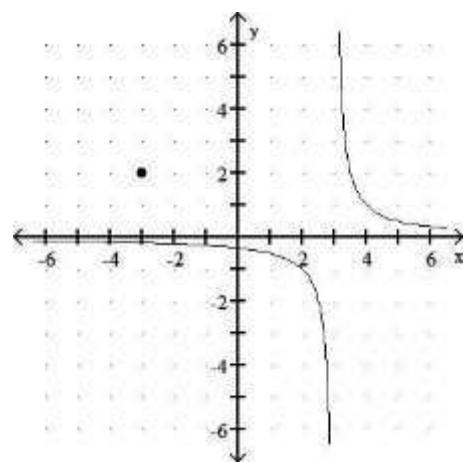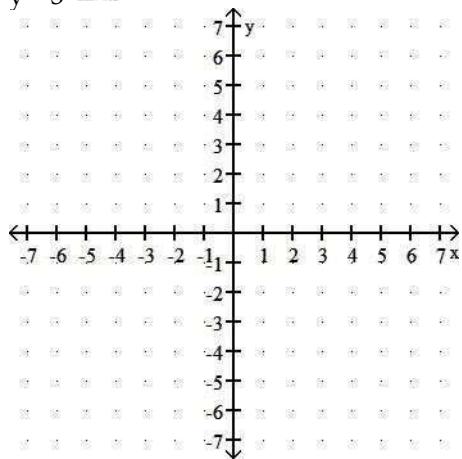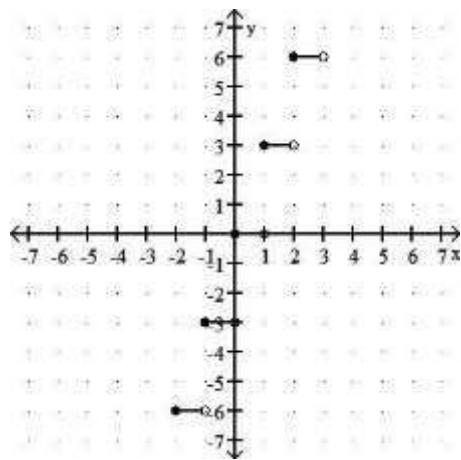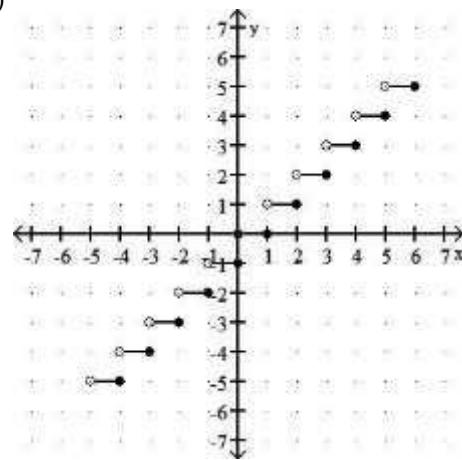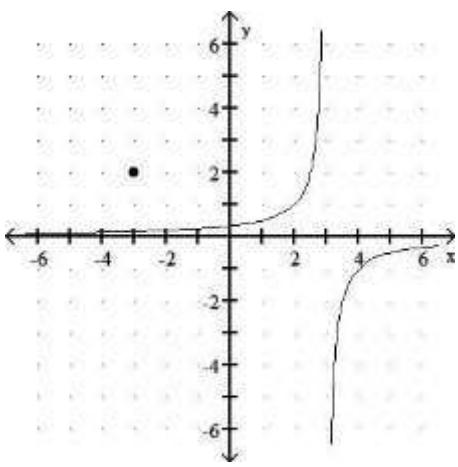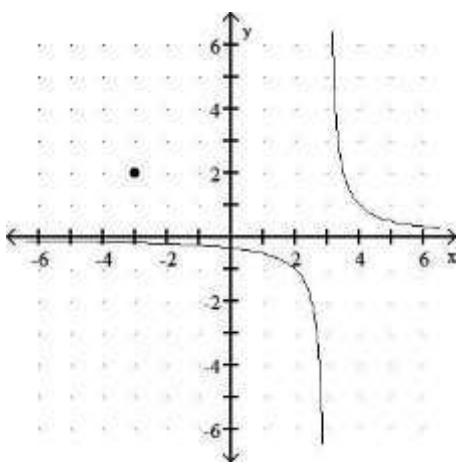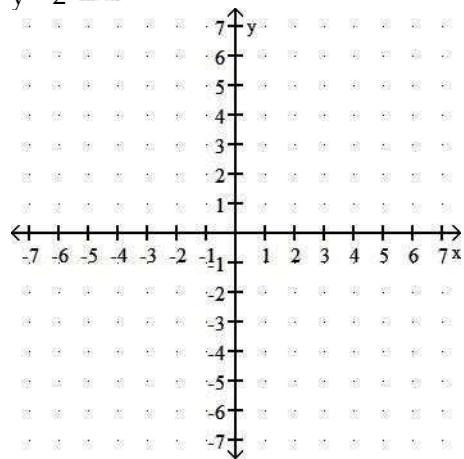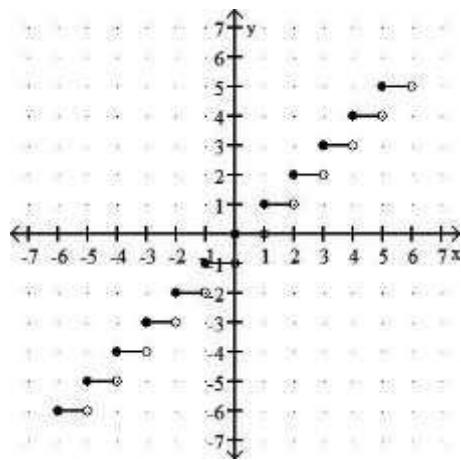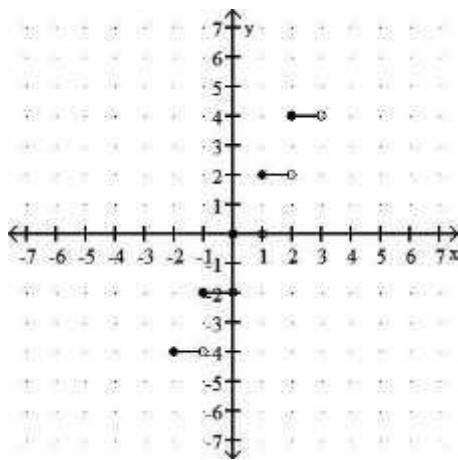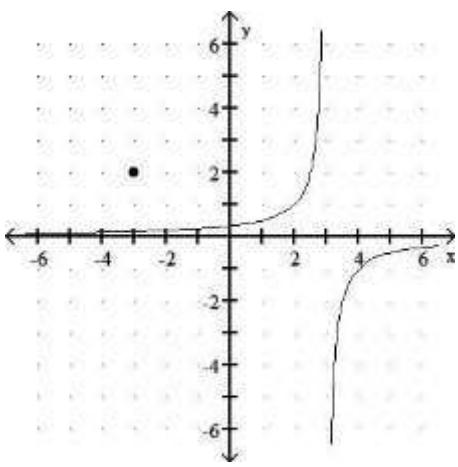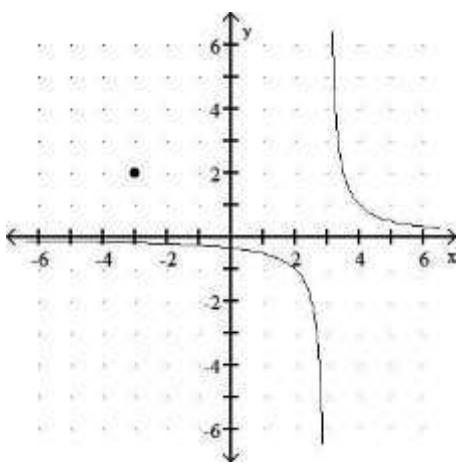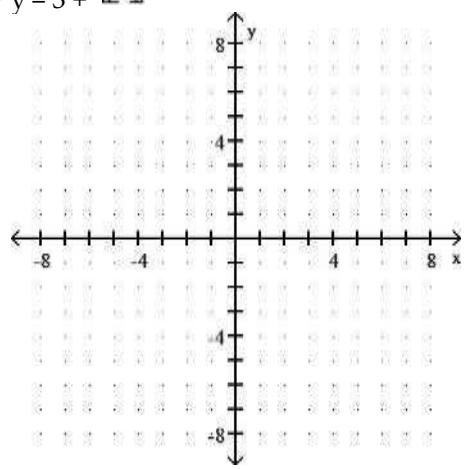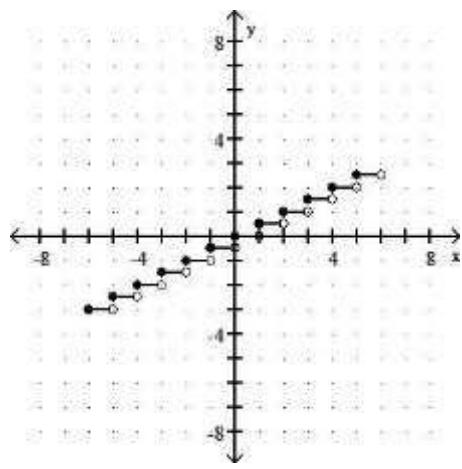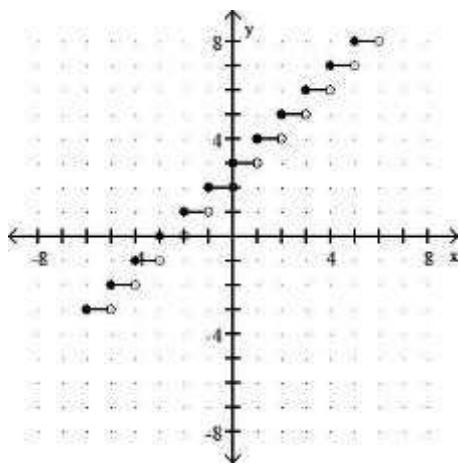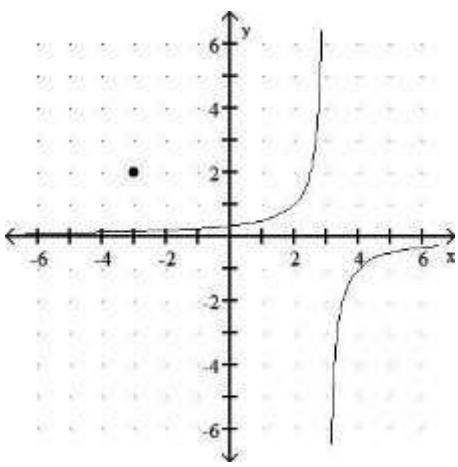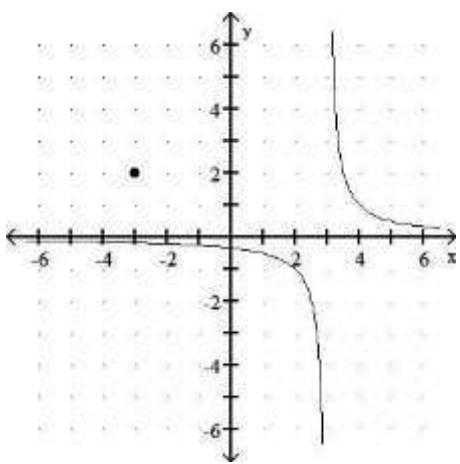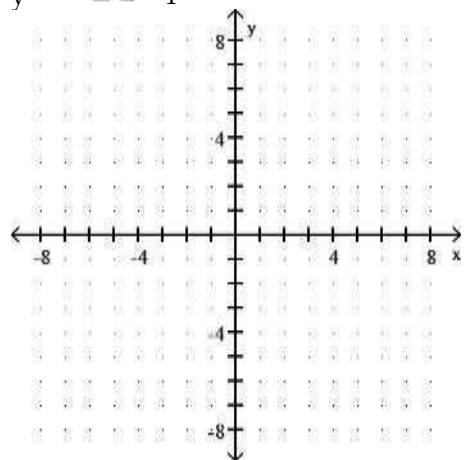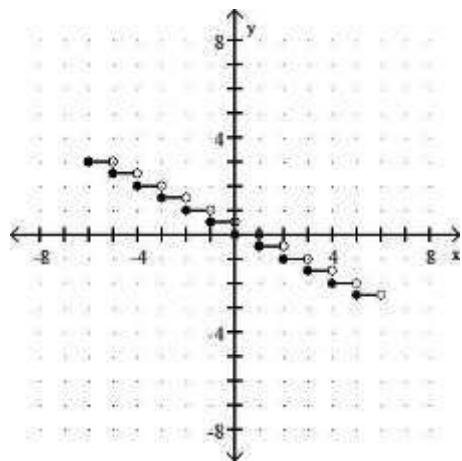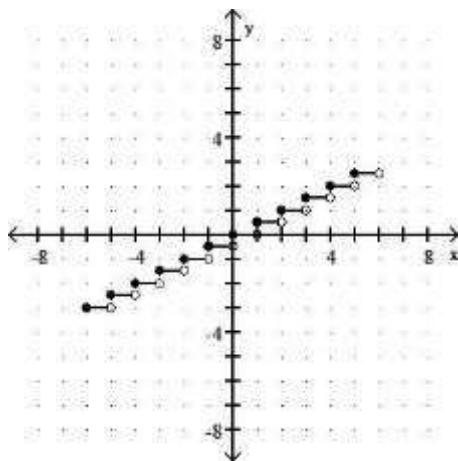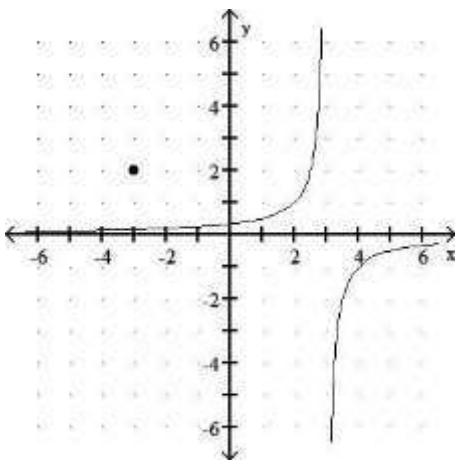
D)
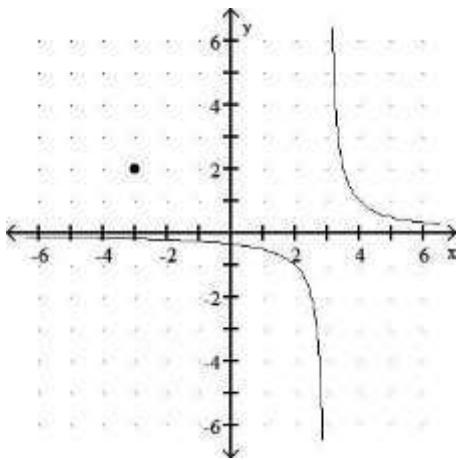
Write an equation for the piecewise function.

62)
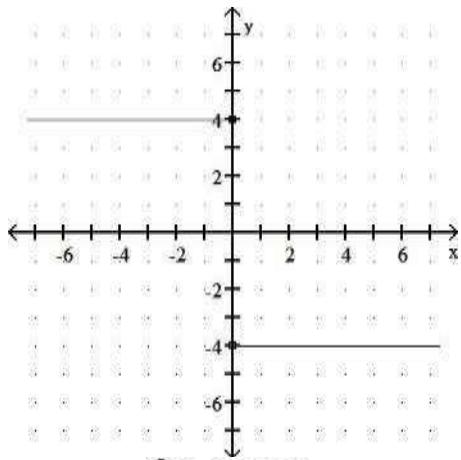
62) _____

A) $f(x) = \begin{cases} -4, & \text{for } x \le 0, \\ 4, & \text{for } x > 0 \end{cases}$

B) $f(x) = \begin{cases} 4, & \text{for } x < 0, \\ -4, & \text{for } x \ge 0 \end{cases}$

C) $f(x) = \begin{cases} 4, & \text{for } x \le 0, \\ -4, & \text{for } x > 0 \end{cases}$

D) $f(x) = \begin{cases} 4x, & \text{for } x \le 0, \\ -4x, & \text{for } x > 0 \end{cases}$

63)
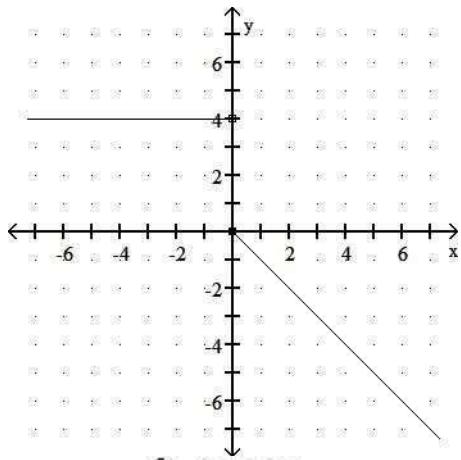
63) _____

A) $f(x) = \begin{cases} 4, & \text{for } x < 0, \\ x, & \text{for } x \ge 0 \end{cases}$

B) $f(x) = \begin{cases} 4, & \text{for } x \le 0, \\ -x, & \text{for } x > 0 \end{cases}$

C) $f(x) = \begin{cases} 4, & \text{for } x < 0, \\ -4x, & \text{for } x \ge 0 \end{cases}$

D) $f(x) = \begin{cases} 4, & \text{for } x < 0, \\ -x, & \text{for } x \ge 0 \end{cases}$

64)

64) _____
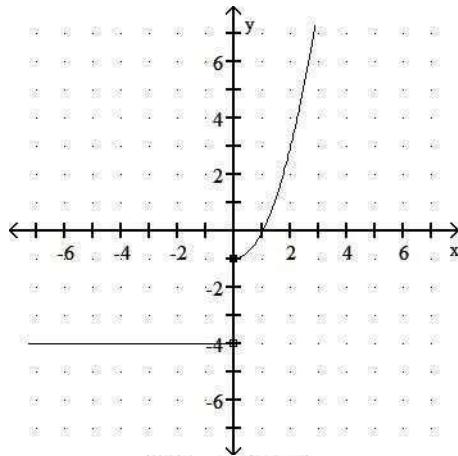
A)
$$f(x) = \begin{cases} 4, & \text{for } x < 0, \\ x^2, & \text{for } x \geq 0 \end{cases}$$

B)
$$f(x) = \begin{cases} -4, & \text{for } x < 0, \\ x^2 - 1, & \text{for } x \geq 0 \end{cases}$$

C)
$$f(x) = \begin{cases} 4, & \text{for } x \leq 0, \\ x^2 - 1, & \text{for } x > 0 \end{cases}$$

D)
$$f(x) = \begin{cases} 4, & \text{for } x < 0, \\ |x| - 1, & \text{for } x \geq 0 \end{cases}$$

65)

65) _____
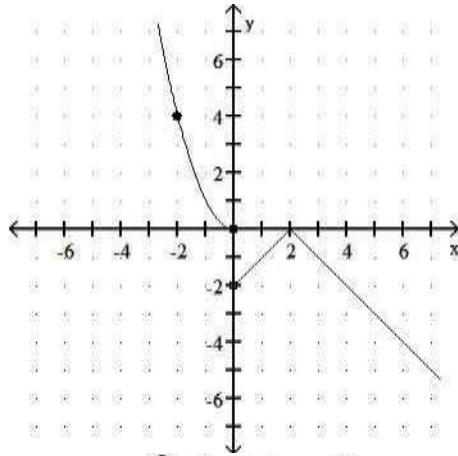
A)
$$f(x) = \begin{cases} -x^2, & \text{for } x \leq 0, \\ |x - 2|, & \text{for } x > 0 \end{cases}$$

B)
$$f(x) = \begin{cases} -|x - 2|, & \text{for } x < 0, \\ x^2, & \text{for } x \geq 0 \end{cases}$$

C)
$$f(x) = \begin{cases} x^2, & \text{for } x \leq 0, \\ -|x + 2|, & \text{for } x > 0 \end{cases}$$

D)
$$f(x) = \begin{cases} x^2, & \text{for } x \leq 0, \\ -|x - 2|, & \text{for } x > 0 \end{cases}$$

66)
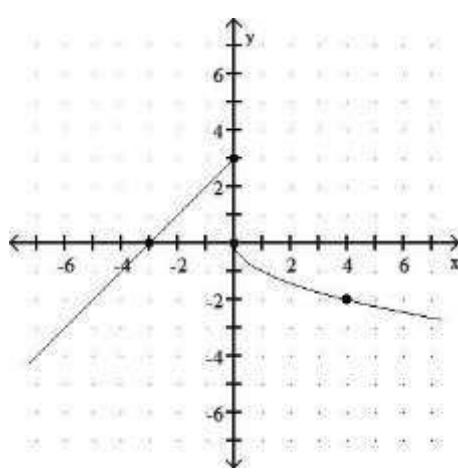
66) _____

A)
$$f(x) = \begin{cases} x + 3, & \text{for } x \le 0, \\ -\sqrt{x}, & \text{for } x > 0 \end{cases}$$

B)
$$f(x) = \begin{cases} x - 3, & \text{for } x \le 0, \\ -x^2, & \text{for } x > 0 \end{cases}$$

C)
$$f(x) = \begin{cases} x + 3, & \text{for } x \le 0, \\ \sqrt{x}, & \text{for } x > 0 \end{cases}$$

D)
$$f(x) = \begin{cases} -x + 3, & \text{for } x \le 0, \\ -\sqrt{x}, & \text{for } x > 0 \end{cases}$$

67)

67) _____
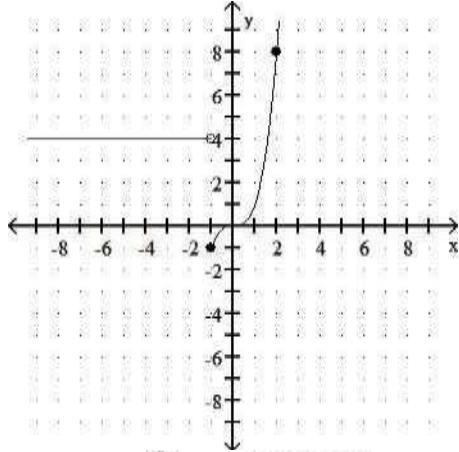
A)
$$f(x) = \begin{cases} 4, & \text{for } x < -1, \\ x^2 - 1, & \text{for } x \ge -1 \end{cases}$$

B)
$$f(x) = \begin{cases} 4, & \text{for } x < -1, \\ x^3 - 1, & \text{for } x \ge -1 \end{cases}$$

C)
$$f(x) = \begin{cases} 4, & \text{for } x < -1, \\ x^2, & \text{for } x \ge -1 \end{cases}$$

D)
$$f(x) = \begin{cases} 4, & \text{for } x < -1, \\ x^3, & \text{for } x \ge -1 \end{cases}$$

68)

68) _____
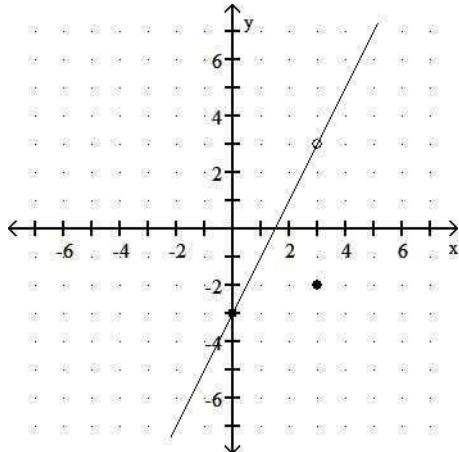
A)
$$f(x) = \begin{cases} 2x - 3, & \text{for } x \ne 3, \\ -3, & \text{for } x = 3 \end{cases}$$

B)
$$f(x) = \begin{cases} 2x - 3, & \text{for } x \ne 3, \\ -2, & \text{for } x = 3 \end{cases}$$

C)
$$f(x) = \begin{cases} 2x - 3, & \text{for } x < 3, \\ 2x + 3, & \text{for } x \ge 3 \end{cases}$$

D)
$$f(x) = \begin{cases} x - 3, & \text{for } x \ne 3, \\ -2, & \text{for } x = 3 \end{cases}$$

69)

69)
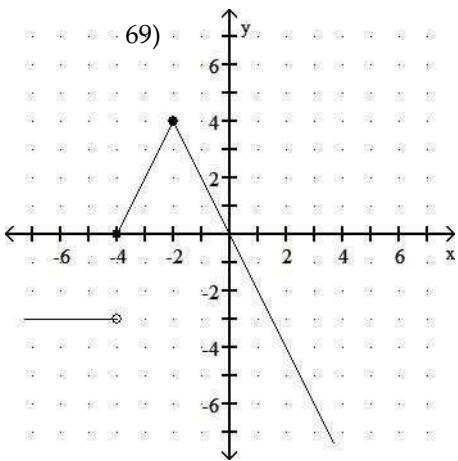
A)

$f(x) = \begin{cases} -3x, & \text{for } x < -4, \\ -2|x + 2| + 4, & \text{for } x \geq -4 \end{cases}$

C)

$f(x) = \begin{cases} -3, & \text{for } x \leq -4, \\ -2|x + 2| + 4, & \text{for } x > -4 \end{cases}$

B)

$f(x) = \begin{cases} -3, & \text{for } x < -4, \\ -2|x + 2| + 4, & \text{for } x \geq -4 \end{cases}$

D)

$f(x) = \begin{cases} -3x, & \text{for } x \leq -4, \\ -2|x + 2| + 4, & \text{for } x > -4 \end{cases}$

70) 70) _____
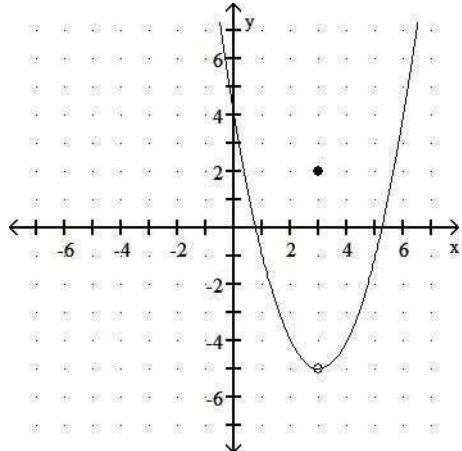
A)

$f(x) = \begin{cases} |x - 3| - 5, & \text{for } x \neq 3, \\ 2, & \text{for } x = 3 \end{cases}$

C)

$f(x) = \begin{cases} (x - 3)^2 - 5, & \text{for } x \neq 3, \\ 2, & \text{for } x = 3 \end{cases}$

B) $f(x) = (x - 3)^2 - 5$

D)

$f(x) = \begin{cases} (x + 3)^2 - 5, & \text{for } x \neq 3, \\ 2, & \text{for } x = 3 \end{cases}$

71) 71) _____
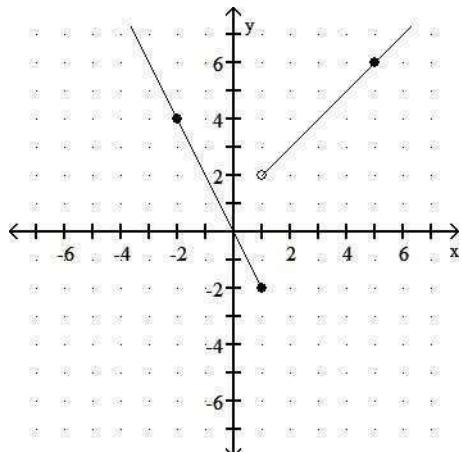
A)

$f(x) = \begin{cases} -2x, & \text{for } x \leq 1, \\ x + 1, & \text{for } x > 1 \end{cases}$

B)

$f(x) = \begin{cases} -x, & \text{for } x \leq 1, \\ 2x + 1, & \text{for } x > 1 \end{cases}$

C)
$$f(x) = \begin{cases} -2x, & \text{for } x \le 1, \\ x + 2, & \text{for } x > 1 \end{cases}$$

D)
$$f(x) = \begin{cases} 2x, & \text{for } x \le 1, \\ x + 1, & \text{for } x > 1 \end{cases}$$

For the pair of functions, find the indicated sum, difference, product, or quotient.

72) $f(x) = x + 5$, $g(x) = x - 4$ 72) _____
   Find $(f + g)(-4)$.
   A) -9   B) 1   C) -17   D) -7

73) $f(x) = x^2 + 9$, $g(x) = 5x + 4$ 73) _____
   Find $(f + g)(2)$.
   A) 25   B) 37   C) 27   D) 23

74) $f(x) = -2x^2 + 7$, $g(x) = x - 4$ 74) _____
   Find $(f - g)(-3)$.
   A) 14   B) -10   C) -12   D) -4

75) $f(x) = x - 4$, $g(x) = -4x^2 + 16x - 4$ 75) _____
   Find $(fg)(3)$.
   A) 56   B) -8   C) -53   D) -280

76) $f(x) = 4x - 5$, $g(x) = 3x^2 + 14x + 2$ 76) _____
   Find $(f/g)(-4)$.
   A) $\frac{7}{}$ B) $\frac{2}{}$ C) $\frac{3}{}$ D) $\frac{1}{2}$

77) $f(x) = x^2 - 1$, $g(x) = 9x + 1$ 77) _____
   $\left(-\dfrac{1}{9}\right)$

   Find (f/g) .
   A) $\frac{1}{}$ B) 0   C) $\frac{2}{3}$ D) does not exist

78) $f(x) = x^2 - 1$, $g(x) = 2x + 1$ 78) _____
   Find $(f/g)(\sqrt{3})$.
   A) $\dfrac{4 - \sqrt{3}}{13}$ B) $\dfrac{3\sqrt{3} + 2}{5}$ C) $\dfrac{4\sqrt{3} - 2}{11}$ D) $\dfrac{\sqrt{3} - 1}{2}$

79) $h(x) = x - 5$, $g(x) = \sqrt{x - 3}$ Find
   Find $(h + g)(28)$.   (hg)(
   A) 48   B) 22   C) 28   D) 33   -1).
                                                                                                   A)
80) $f(x) = x + 3$, $g(x) = \sqrt{x - 2}$ -3 -
   Find $(f - g)(-3)$. $\sqrt{5}$
   A) does not exist   B) 0   C) $\sqrt{2}$ D) $\sqrt{5}$ B)
   1
 $\sqrt{5}$
81) $h(x) = x - 2$, $g(x) = \sqrt{x + 6}$ C)

$-3\sqrt{5}$ D) does not exist   79) _____

80) _____

81) _____

82) $f(x) = 8x - 2$, $g(x) = 5x - 9$

Find $(f - g)(x)$.

  A) $-3x - 7$ B) $13x - 11$ C) $3x + 7$ D) $3x - 11$

82) _____

83) $f(x) = 4x^2 - 7x$, $g(x) = x^2 - 3x - 28$

Find $(f/g)(x)$.

  A) $\dfrac{4x - 7}{}$ B) $\dfrac{4 - x}{}$ C) $\dfrac{4x}{}$ D) $\dfrac{4x^2 - 7x}{x^2 - 3x - 28}$

83) _____

84) $f(x) = 2 - 9x$, $g(x) = -5x + 9$

Find $(f + g)(x)$.

  A) $-14x + 11$ B) $-4x + 11$ C) $-3x$ D) $-5x + 2$

84) _____

85) $f(x) = \sqrt{2x + 4}$, $g(x) = \sqrt{25x - 16}$

Find $(fg)(x)$.

  A) $(5x - 4)(\sqrt{2x + 4})$ B) $(\sqrt{2x + 4})(\sqrt{25x - 16})$
  C) $(2x + 4)(25x - 16)$ D) $(2x + 4)(5x - 4)$

85) _____

86) $f(x) = 2x + 5$, $g(x) = 6x + 8$

Find $(fg)(x)$.

  A) $8x^2 + 46x + 13$ B) $12x^2 + 40$ C) $12x^2 + 38x + 40$ D) $12x^2 + 46x + 40$

86) _____

87) $f(x) = 4x - 7$, $g(x) = 9x - 5$

Find $(f/g)(x)$.

  A) $\dfrac{4x + 7}{9x + 5}$ B) $\dfrac{4x - 7}{9x - 5}$ C) $\dfrac{9x + 5}{4x + 7}$ D) $\dfrac{9x - 5}{4x - 7}$

87) _____

88) $f(x) = 5 + x$, $g(x) = 4|x|$

Find $(g/f)(x)$.

  A) $\dfrac{4|x|}{} + x$ B) $\dfrac{5 + x}{4|x|}$ C) $\dfrac{4|x|}{5 + x}$ D) $4|x| - 5 + x$

88) _____

89) $f(x) = 16 - x^2$; $g(x) = 4 - x$

Find $(f + g)(x)$.

  A) $-x^2 + x + 12$ B) $4 + x$
  C) $x^3 - 4x^2 - 16x + 64$ D) $-x^2 - x + 20$

89) _____

90) $f(x) = \dfrac{7}{x - 2}$, $g(x) = \dfrac{1}{3 + x}$

Find $(ff)(x)$.

  A) $\dfrac{49}{(x - 2)^2}$ B) $\dfrac{49}{(x - 2)(3 + x)}$ C) $\dfrac{7}{(x - 2)^2}$ D) $\dfrac{49}{x - 2^2}$

90) _____

91) $f(x) = \dfrac{1}{x - 2}$, $g(x) = \dfrac{1}{5 + x}$

Find $(f/g)(x)$.

  A) $\dfrac{1(5 + x)}{x - 2}$ B) $\dfrac{1}{(x - 2)(5 + x)}$ C) $\dfrac{5 + x}{1(x - 2)}$ D) $\dfrac{x - 2}{1(5 + x)}$

91) _____

For the pair of functions, find the indicated domain.

92) $f(x) = 2x - 5$, $g(x) = \sqrt{x + 10}$

Find the domain of f + g.

   A) (-10, 10)   B) [-10, ∞)   C) [0, ∞)   D) [10, ∞)

92) _____

93) $f(x) = 2x - 5$, $g(x) = \sqrt{x + 6}$

Find the domain of f/g.

   A) (-6, ∞)   B) [6, ∞)   C) (-6, 6)   D) [0, ∞)

93) _____

94) $f(x) = x^2 - 9$, $g(x) = 2x + 3$

Find the domain of f - g.

   A) [0, ∞)   B) (-∞, ∞)   C) [3, ∞)   D) (-3, 3)

94) _____

95) $f(x) = x^2 - 64$, $g(x) = 2x + 3$

Find the domain of f/g.

   A) $\left[-\infty, -\dfrac{3}{2}\right) \cup \left(-\dfrac{3}{2}, \infty\right)$ B) $\left[-\dfrac{3}{2}, \infty\right)$

   C) (-∞, ∞)   D) (-8, 8)

95) _____

96) $f(x) = x^2 - 64$, $g(x) = 2x + 3$

Find the domain of g/f.

   A) $\left[-\dfrac{3}{2}, \infty\right)$ B) (-∞, -8) U (-8, 8) U (8, ∞)

   C) $\left[-\infty, -\dfrac{3}{2}\right) \cup \left(\dfrac{3}{2}, \infty\right)$ D) (-∞, ∞)

96) _____

97)

For $f(x) = \sqrt{x - 6}$ and $g(x) = \dfrac{1}{x - 8}$

Find the domain of fg.

   A) [0, 8) U (8, ∞)   B) (6, 8) U (8, ∞)   C) [6, 8) U (8, ∞)   D) [6, ∞)

97) _____

98) $f(x) = \sqrt{6 - x}$; $g(x) = \sqrt{x - 3}$

Find the domain of fg.

   A) (3, 6)   B) (-∞, 18) U (18, ∞)
   C) (-∞, 3) U (6, ∞)   D) [3, 6]

98) _____

99)

$f(x) = 3x - 2$, $g(x) = \dfrac{3}{x + 7}$

Find the domain of f + g.

   A) (-∞, -3) or (-3, ∞)   B) (-∞, ∞)
   C) (0, ∞)   D) (-∞, -7) or (-7, ∞)

99) _____

100)

$f(x) = \dfrac{2x}{x - 6}$, $g(x) = \dfrac{5}{x + 9}$

Find the domain of f + g.

   A) (-∞, -5) U (-5, -2) U (-2, ∞)   B) (-∞, -9) U (-9, 6) U (6, ∞)
   C) (-∞, -6) U (-6, 9) U (9, ∞)   D) (-∞, ∞)

100) _____

101) $f(x) = 3x^2 + 2$, $g(x) = 2x^3 + 7$

Find the domain of f + g.

A) (-∞, ∞)

B) (-∞, 0) U (0, ∞)

C) (-∞, -3) U (-3, -2) U (-2, ∞)

D) (0, ∞)

101) _____

Consider the functions F and G as shown in the graph. Provide an appropriate response.

102) Find the domain of F + G.

102) _____
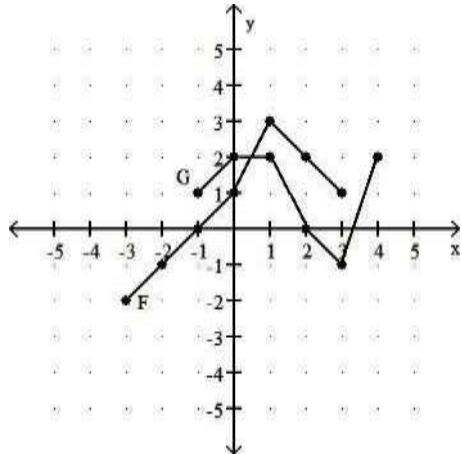
A) [-1,3]   B) [-1,4]   C) [-3,4]   D) [-3,3]

103) Find the domain of F - G.

103) _____
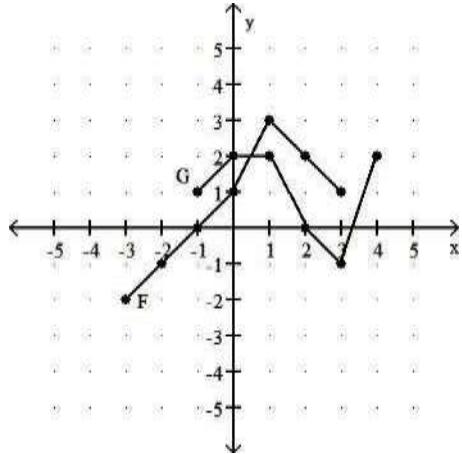
A) [-1,4]   B) [-3,4]   C) [-3,3]   D) [-1,3]

104) Find the domain of FG.

104) _____
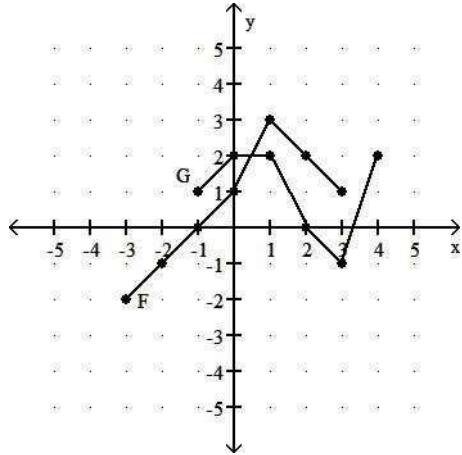
A) [-3,3]   B) [-1,4]   C) [-1,3]   D) [-3,4]

105) Find the domain of F/G.   105) _____
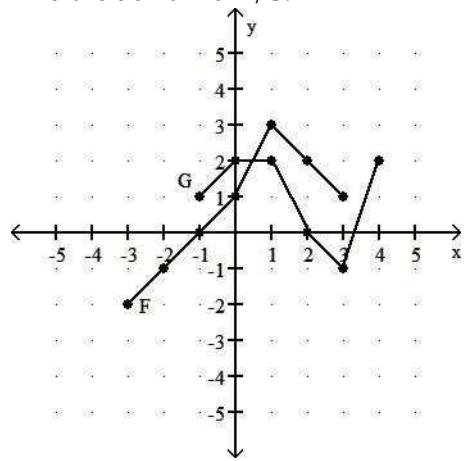
A) [-1,3]   B) [-3,-1) U (-1,4)   C) [-3,4]   D) [-1,2) U (2,3]

106) Find the domain of G/F.   106) _____
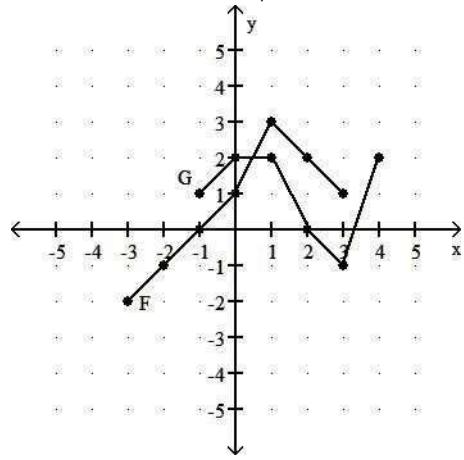
A) [-1,2) U (2,3)   B) [-3,4]   C) [-3,3]   D) (-1,3]

107) Graph F + G.   107) _____

A)

B)

C)

D)

108) Graph F - G.

108) _____

A)

B)

C)

D)

109) Graph G - F.

109) _____

A)
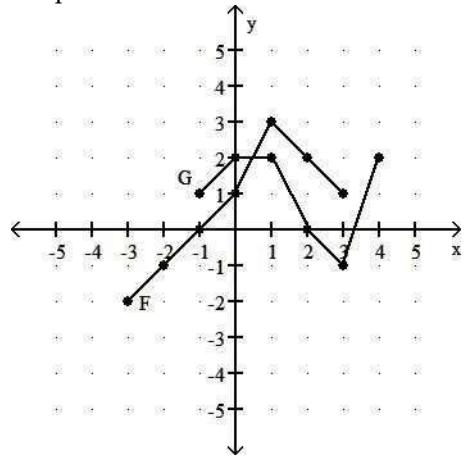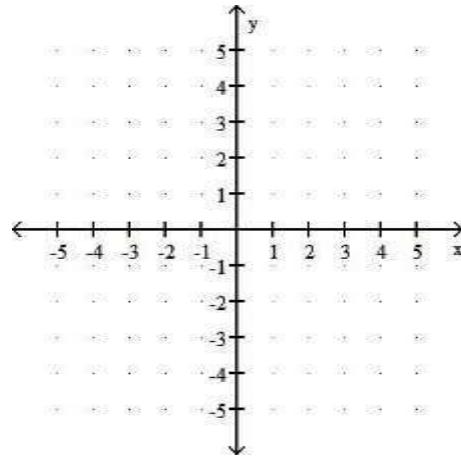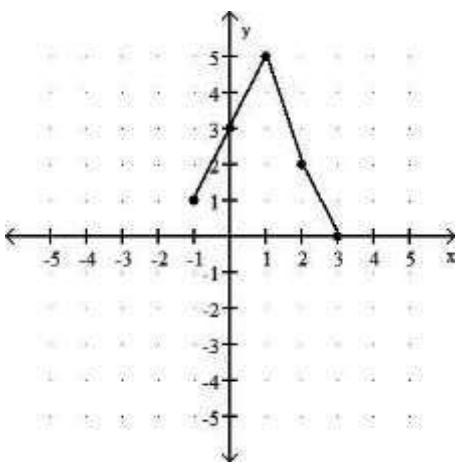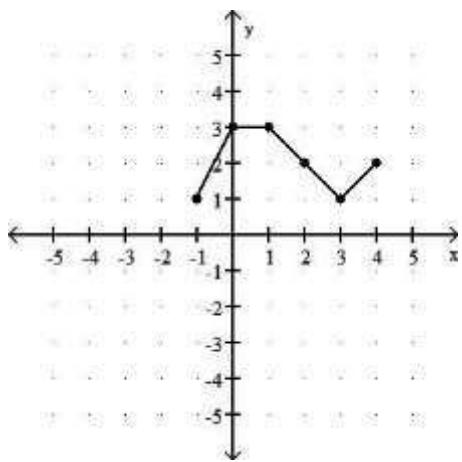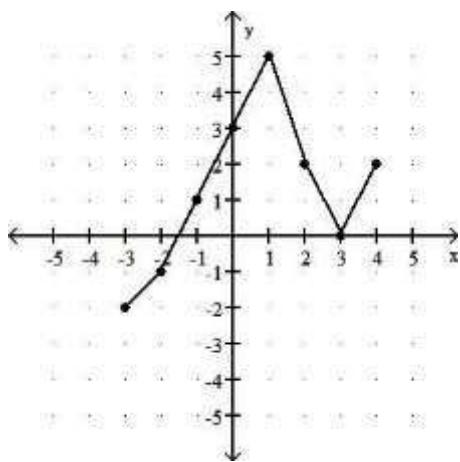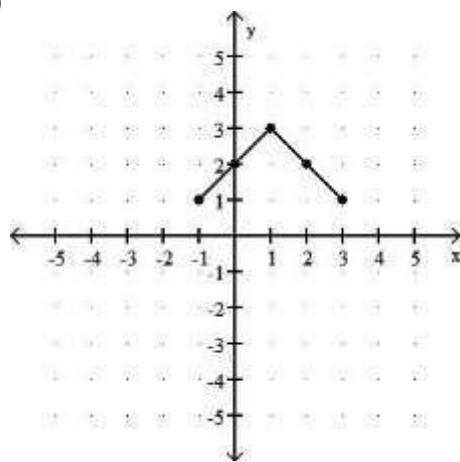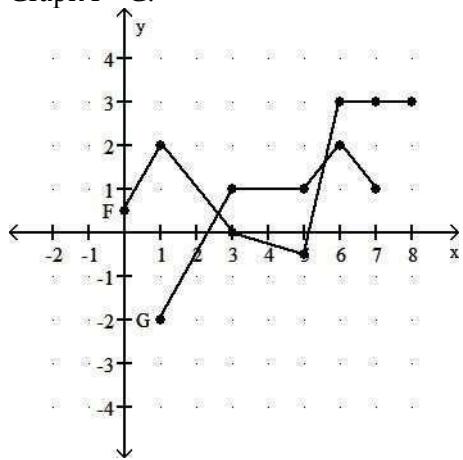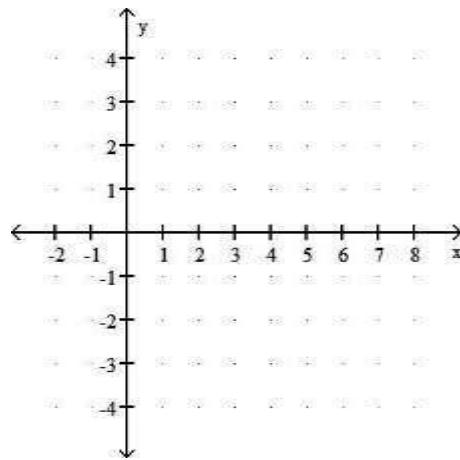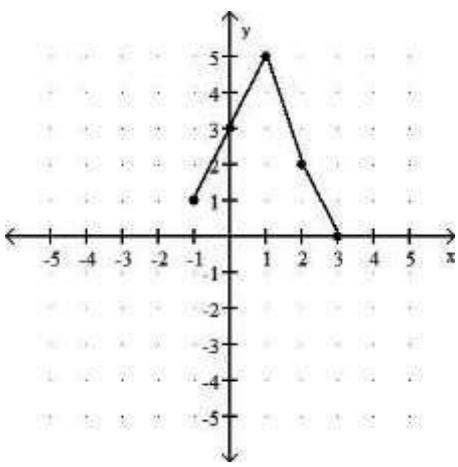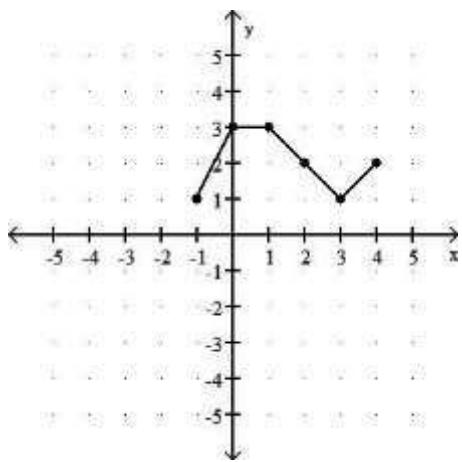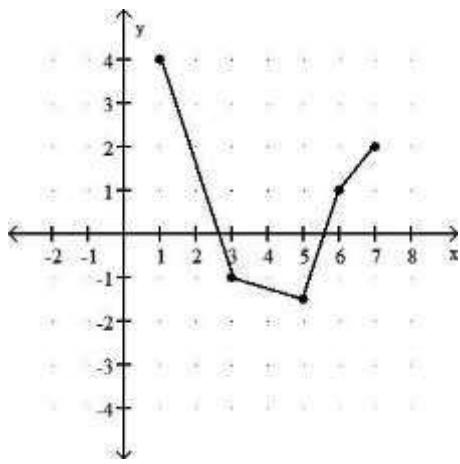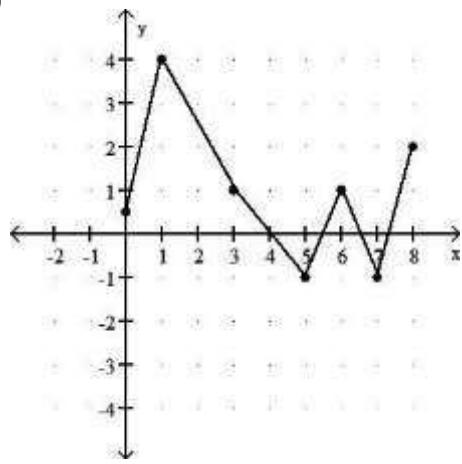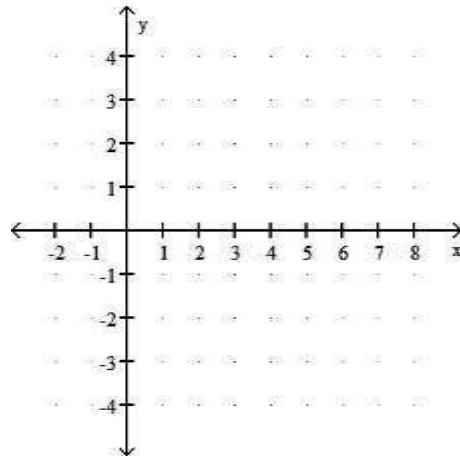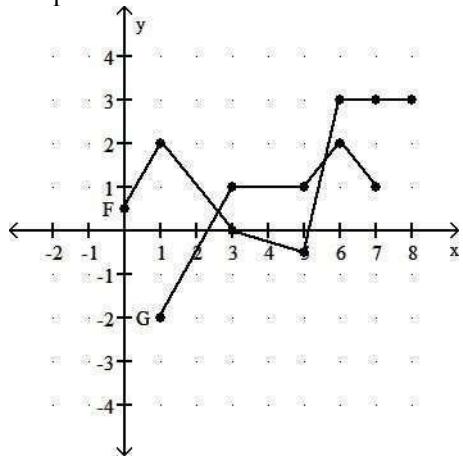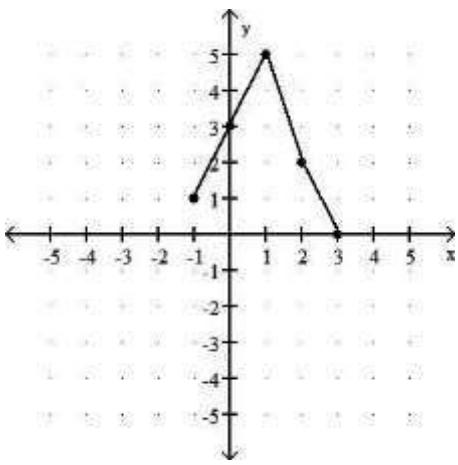
B)
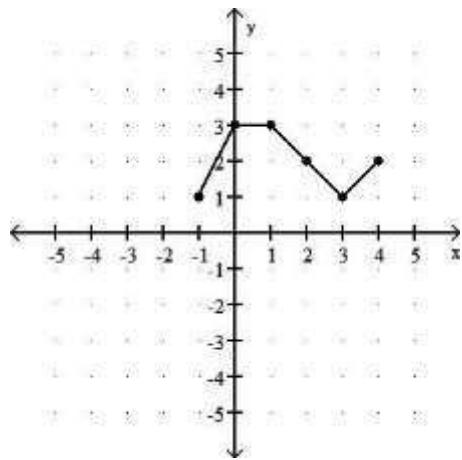
C)
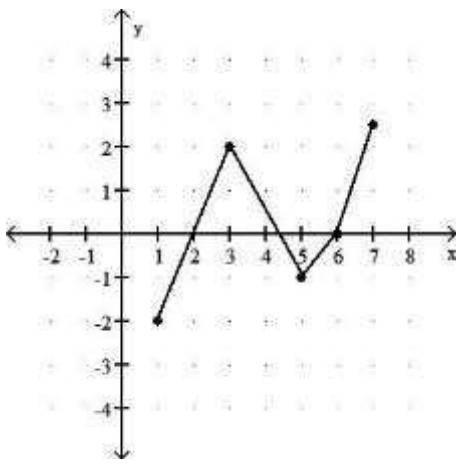
D)
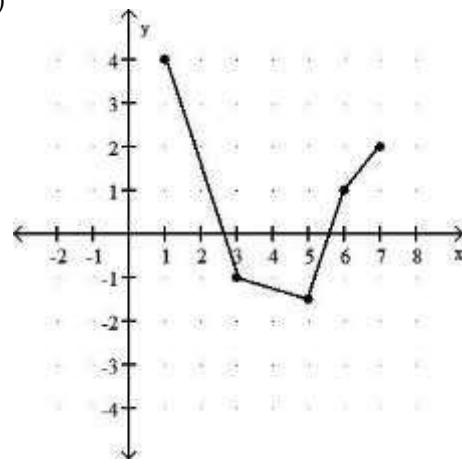
Solve.

110) At Allied Electronics, production has begun on the X-15 Computer Chip. The total revenue function is given by $R(x) = 47x - 0.3x^2$ and the total cost function is given by $C(x) = 6x + 13$, 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).

110) _____

A) $P(x) = -0.3x^2 + 35x + 13$

B) $P(x) = -0.3x^2 + 41x - 13$

C) $P(x) = 0.3x^2 + 41x - 26$

D) $P(x) = 0.3x^2 + 35x - 39$

111) At Allied Electronics, production has begun on the X-15 Computer Chip. The total revenue function is given by $R(x) = 47x - 0.3x^2$ and the total profit function is given by $P(x) = -0.3x^2 + 37x - 10$, 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).

111) _____

A) $C(x) = 12x + 6$

B) $C(x) = 10x + 10$

C) $C(x) = 11x + 15$

D) $C(x) = -0.3x^2 + 20x + 10$

112) At Allied Electronics, production has begun on the X-15 Computer Chip. The total cost function is given by $C(x) = 7x + 14$ and the total profit function is given by $P(x) = -0.3x^2 + 51x - 14$, 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).

112) _____

A) $R(x) = 57x - 0.6x^2$

B) $R(x) = 60x - 0.3x^2$

C)

R(

x) = 58x +
0.3x^2

D)   R(
x)
=
58
x -
0.
3
x^2

113) AAA Technology finds that the total revenue function associated with producing a new type of computer chip is $R(x) = 80 - 0.3x^2$, and the total cost function is $C(x) = 5x + 18$, where x represents the number of units of chips produced. Find the total profit function, P(x).

    113) _____

A) P(x) = -0.03x^2 + 5x - 62

B) P(x) = -0.03x^2 - 5x + 62

C) P(x) = -0.03x^2 + 5x + 98

D) P(x) = 0.03x^2 + 5x + 64

114) Acme Communication finds that the total revenue function associated with producing a new type of cellular phone is $R(x) = 206x - x^2$, and the total cost function is $C(x) = 6000 + 8x$, where x represents the number of units of cellular phones produced. Find the total profit function, P(x).

    114) _____

A) P(x) = -x^2 + 198x - 6000

B) P(x) = -2x^2 + 220x - 7000

C) P(x) = -x^2 + 214x + 6000

D) P(x) = x^4 - 198x^2 + 6000

For the function f, construct and simplify the difference quotient $\dfrac{f(x + h) - f(x)}{h}$.

115) f(x) = 3x + 5

    115) _____

A) 3 + $\dfrac{10}{h}$

B) 3 + $\dfrac{6(x + 5)}{h}$

C) 3

D) 0

116) f(x) = $\dfrac{1}{5x}$

    116) _____

A) $\dfrac{-1}{5x\,(x + h)}$

B) 0

C) $\dfrac{1}{5x}$

D) $\dfrac{-1}{x\,(x + h)}$

117) f(x) = $\dfrac{16}{x + 14}$

    117) _____

A) $-\dfrac{16}{(x + 16)^2}$

B) $\dfrac{16}{(x + h + 14)(x + 14)}$

C) $-\dfrac{224}{(x + h + 14)(x + 14)}$

D) $-\dfrac{16}{(x + h + 14)(x + 14)}$

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

    118) _____

A) $\dfrac{x}{(7 - x + h)(7 - x)}$

B) $\dfrac{7}{(7 - x - h)(7 - x)}$

C) $-\dfrac{7}{(7 - x + h)(7 - x)}$

D) $\dfrac{hx}{(7 - x - h)(7 + x)}$

119)   f(x) =

$\dfrac{x-19}{x+3}$ 119)

    A) $\dfrac{22}{x(x+3)}$ B) $\dfrac{22(x+h+3)}{(x+3)}$

    C) $\dfrac{22}{(x+h+3)(x+3)}$ D) $\dfrac{23}{(x+3)(x-3)}$

120) $f(x) = 7 - 7x^3$ 120) _____

    A) $-7(x^2 - xh - h^2)$ B) $-7(3x^2 - 3x - h)$

    C) $-7(3x^2 + 3xh + h^2)$ D) $-21x^2$

121) $f(x) = 6x^2 + 3x$ 121) _____

    A) $12x + 6h + 3$ B) $12x^2 + 6h + 3x$ C) $18x - 8h + 6$ D) $12x + 3$

122) $f(x) = 9|x| + 4x$ 122) _____

    A) $\dfrac{9|x+h| - 4h - 9|x|}{}$ B) $\dfrac{-9|x+h| - 5h + 9|x|}{}$

    C) $-5h$ D) $-3h$

Find the requested function value.

123)   123) _____

    $f(x) = \dfrac{x-7}{}$, $g(x) = 5x + 4$

    Find $(g \circ f)(-17)$.

    A) -16 B) $\dfrac{44}{}$ C) 324 D) -36

124) $f(x) = 5x + 1$, $g(x) = -2x^2 - 3x - 4$ 124) _____

    Find $(f \circ g)(-5)$.

    A) 106 B) 116 C) -194 D) -1084

125) $f(x) = 8x - 2$, $g(x) = -3x^2 - 5x - 4$ 125) _____

    Find $(g \circ f)(-9)$.

    A) -1618 B) $-16,062$ C) 542 D) 588

126)   126) _____

    $f(x) = \dfrac{x-9}{9}$, $g(x) = 4x + 6$

    Find $(g \circ f)(-9)$.

    A) 60 B) -2 C) $\dfrac{13}{3}$ D) -20

For the pair of functions, find the indicated composition.

127) $f(x) = 4x + 15$, $g(x) = 3x - 1$ 127) _____

    Find $(f \circ g)(x)$.

    A) $12x + 11$ B) $12x + 14$ C) $12x + 44$ D) $12x + 19$

128) $f(x) = -3x + 6$, $g(x) = 5x + 7$ 128) _____

    Find $(g \circ f)(x)$.

    A) $-15x + 37$ B) $-15x + 27$ C) $-15x - 23$ D) $15x + 37$

129)

$f(x) = \dfrac{6}{x-4}$, $g(x) = \dfrac{3}{4x}$

Find $(f \circ g)(x)$.

A) $\dfrac{6x}{}$ B) $\dfrac{24x}{}$ C) $\dfrac{24x}{}$ D) $\dfrac{3x-12}{}$

129) _____

130)

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

Find $(g \circ f)(x)$.

A) $10x + 27$ B) x C) $x + 6$ D) $x - \dfrac{3}{10}$

130) _____

131) $f(x) = \sqrt{x+7}$, $g(x) = 8x - 11$

Find $(f \circ g)(x)$.

A) $2\sqrt{2x+1}$ B) $2\sqrt{2x-1}$ C) $8\sqrt{x-4}$ D) $8\sqrt{x+7} - 11$

131) _____

132) $f(x) = 4x^2 + 3x + 8$, $g(x) = 3x - 6$

Find $(g \circ f)(x)$.

A) $12x^2 + 9x + 18$ B) $4x^2 + 3x + 2$ C) $12x^2 + 9x + 30$ D) $4x^2 + 9x + 18$

132) _____

133)

$f(x) = \dfrac{2}{x}$, $g(x) = 7x4$

Find $(g \circ f)(x)$.

A) $\dfrac{2}{7x^4}$ B) $\dfrac{112}{x^4}$ C) $\dfrac{7x^4}{16}$ D) $\dfrac{7x^4}{2}$

133) _____

134)

$f(x) = \dfrac{9}{2}x$, $g(x) = -\dfrac{2}{9}x$

Find $(f \circ g)(x)$.

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

134) _____

135)

$f(x) = x^4 + 5$, $g(x) = \sqrt[4]{x-5}$

Find $(g \circ f)(x)$.

A) $-x$ B) $|x|$ C) x^4 D) x

135) _____

136) $f(x) = x^3 - 6x^2 + 2x + 6$, $g(x) = x - 1$

Find $(f \circ g)(x)$.

A) $x^3 - 9x^2 + 17x - 3$ B) $x^3 - 6x^2 + 2x + 7$

C) $x^3 - 3x^2 - 7x + 3$ D) $x^3 - 6x^2 + 2x + 5$

136) _____

For the pair of functions, find the indicated domain.

137) $f(x) = 5x + 35$, $g(x) = x + 5$

Find the domain of $f \circ g$.

A) $(-\infty, 12) \cup (12, \infty)$ B) $(-\infty, \infty)$

C) $(-\infty, -12) \cup (-12, \infty)$ D) $(-\infty, -12] \cup [-12, \infty)$

137) _____

138)   f(x) =

$\dfrac{10}{x+3}$, 138)

g(x) = x + 1

Find the domain of f ∘ g.

  A) (-∞, -4) U (-4, ∞)   B) (-∞, -4] U [-4, ∞)

  C) (-∞, -3) U (-3, ∞)   D) (-∞, ∞)

139) $f(x) = \dfrac{10}{x+3}$, g(x) = x + 8

  Find the domain of g ∘ f.

  A) (-∞, -3) U (-3, ∞)   B) (-∞, -3] U [-3, ∞)

  C) (-∞, ∞)   D) (-∞, -11) U (-11, ∞)

139) _____

140) $f(x) = 2x - 5, g(x) = \sqrt{x+6}$

  Find the domain of f ∘ g.

  A) [6, ∞)   B) [-6, ∞)   C) (-6, 6)   D) [0, ∞)

140) _____

141) $f(x) = 2x - 5, g(x) = \sqrt{x+5}$

  Find the domain of g ∘ f.

  A) [0, ∞)   B) (-5, 5)   C) [-∞,0)   D) [5, ∞)

141) _____

142) $f(x) = x^2 - 64, g(x) = 2x + 3$

  Find the domain of f ∘ g.

  A) (-8, 8)   B) [8, ∞)   C) [0, ∞)   D) (-∞, ∞)

142) _____

143) $f(x) = x^2 - 36, g(x) = 2x + 3$

  Find the domain of g ∘ f.

  A) (-6, 6)   B) (-∞, ∞)

  C) $\left[-\dfrac{3}{2}, \infty\right)$ D) $\left(-\infty, -\dfrac{3}{2}\right)$ U $\left(-\dfrac{3}{2}, \infty\right)$

143) _____

144) $f(x) = \sqrt{x}, g(x) = 6x + 30$

  Find the domain of f ∘ g.

  A) (-∞, ∞)   B) [0, ∞)   C) (-∞, -5] U [0, ∞)   D) [-5, ∞)

144) _____

145) $f(x) = x^2 - 16, g(x) = 2x + 3$

  Find the domain of g ∘ f.

  A) [4, ∞)   B) $\left(-\infty, -\dfrac{3}{2}\right)$ U $\left(-\dfrac{3}{2}, \infty\right)$

  C) (-∞, ∞)   D) (-4, 4)

145) _____

Find f(x) and g(x) such that h(x) = (f ∘ g)(x).

146) $h(x) = \dfrac{1}{x^2 - 7}$

  A)   f(x) =

146) _____

$\dfrac{1}{x^2}$, g(x) = x - 7

B) $f(x) = \dfrac{1}{x^2}$, $g(x) = -\dfrac{1}{7}$

C) $f(x) = \dfrac{1}{x}$, g(x) = x^2 - 7

D) $f(x) = \dfrac{1}{7}$, g(x) = x^2 - 7

147) h(x) = $|6x + 2|$ 147) _____
     A) f(x) = $-|x|$, g(x) = 6x + 2   B) f(x) = $|-x|$, g(x) = 6x - 2
     C) f(x) = $|x|$, g(x) = 6x + 2   D) f(x) = x, g(x) = 6x + 2

148) h(x) = $\dfrac{9}{x^2}$ + 10   148) _____
     A) $f(x) = \dfrac{9}{x^2}$, g(x) = 10   B) $f(x) = x + 10$, $g(x) = \dfrac{9}{x^2}$
     C) $f(x) = x$, $g(x) = \dfrac{9}{x}$ + 10   D) $f(x) = \dfrac{1}{x}$, $g(x) = \dfrac{9}{x}$ + 10

149) h(x) = $\dfrac{6}{\sqrt{2x + 6}}$ 149) _____
     A) $f(x) = \dfrac{6}{\ \ }$, g(x) = 2x + 6   B) f(x) = 6, g(x) = $\sqrt{2x + 6}$
     C) $f(x) = \dfrac{6}{\sqrt{x}}$, g(x) = 2x + 6   D) f(x) = $\sqrt{2x + 6}$, g(x) = 6

150) h(x) = (7x + 15)2   150) _____
     A) f(x) = 7x2, g(x) = x + 15   B) f(x) = 7x + 15, g(x) = x2
     C) f(x) = x2, g(x) = 7x + 15   D) f(x) = (7x)2, g(x) = 15

151) h(x) = $\sqrt{-16x^2 + 67}$ 151) _____
     A) f(x) = $\sqrt{x}$, g(x) = -16x2 + 67   B) f(x) = $\sqrt{-16x^2}$, g(x) = $\sqrt{67}$
     C) f(x) = $\sqrt{-16x + 67}$, g(x) = x2   D) f(x) = -16x2 + 67, g(x) = $\sqrt{x}$

152) h(x) = $\sqrt{5 - \sqrt{x - 5}}$ 152) _____
     A) f(x) = $\sqrt{x - 5}$, g(x) = $\sqrt{x - 5}$ B) f(x) = $\sqrt{x - 5}$, g(x) = $\sqrt{5 - x}$
     C) f(x) = $\sqrt{5 - x}$, g(x) = $\sqrt{x - 5}$ D) f(x) = $\sqrt{5 + x}$, g(x) = $\sqrt{x - 5}$

153) h(x) = $(x - 4)^5$ + 4$(x - 4)^4$ - 4$(x - 4)^2$ + 4   153) _____
     A) f(x) = x^5 - 4x^4 + 4x^2 + 4, g(x) = x + 4   B) f(x) = x^5 + 4x^4 - 4x^2, g(x) = x - 8

C) $f(x) = x^5 + x^4 - x^2 + 4$, $g(x) = x - 4$

D) $f(x) = x^5 + 4x^4 - 4x^2 + 4$, $g(x) = x - 4$

154) $h(x) = \left(\dfrac{x^3 + 5}{5 - x^3}\right)^8$ 154) _____

A) $f(x) = (x^3 + 5)^8$, $g(x) = 5 - x^3$

B) $f(x) = x^8$, $g(x) = \dfrac{x^3 + 5}{5 - x^3}$

C) $f(x) = \dfrac{1}{x^8}$, $g(x) = \dfrac{x^3 + 5}{5 - x^3}$

D) $f(x) = \dfrac{x^3 + 5}{5 - x^3}$, $g(x) = x^8$

155) $h(x) = \sqrt{\dfrac{x + 2}{x - 1}}$ 155) _____

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

B) $f(x) = \sqrt{x}$, $g(x) = \dfrac{x + 2}{}$

C) $f(x) = \sqrt{x + 2}$, $g(x) = \dfrac{1}{x - 1}$

D) $f(x) = \sqrt{\dfrac{1}{x - 1}}$, $g(x) = x + 2$

Solve the problem.

156) A balloon (in the shape of a sphere) is being inflated. The radius is increasing at a rate of 10 cm   156) _____
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 ∘ r)(t).

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

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

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

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

157) A stone is thrown into a pond. A circular ripple is spreading over the pond in such a way that   157) _____
the radius is increasing at the rate of 2.6 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 ∘ r)(t).

A) $(A \circ r)(t) = 6.76\pi t^2$

B) $(A \circ r)(t) = 6.76\pi^2 t$

C) $(A \circ r)(t) = 2.6\pi t^2$

D) $(A \circ r)(t) = 5.2\pi t^2$

158) Ken is 6 feet tall and is walking away from a streetlight. The streetlight has its light bulb 14 feet   158) _____
above the ground, and Ken is walking at the rate of 1.9 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 $(S \circ d)(t)$.

A) $(S \circ d)(t) = 1.81t$

B) $(S \circ d)(t) = 3.21t$

C) $(S \circ d)(t) = 1.05t$

D) $(S \circ d)(t) = 1.43t$

1) B
2) A
3) C
4) C
5) B
6) C
7) D
8) C
9) D
10) A
11) C
12) D
13) D
14) A
15) A
16) D
17) C
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