

Test Bank for College Algebra 6th Edition by Dugopolski ISBN 0321916603 9780321916600

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Test Bank

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Solution Manual:

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

For the given pair of variables determine whether a is a function of b , b is a function of a , both, or neither.

- 1) a is the number of years of formal education of an adult living in the United States, and b is his or her age in years.
- A) a is a function of b
 - B) b is a function of a
 - C) Both
 - D) Neither

Answer: D

- 2) a is the radius of any spherical bowling ball, and b is its volume. A) b is a function of a
- B) Neither
 - C) a is a function of b
 - D) Both

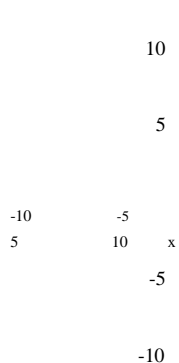
Answer: D

- 3) a is the savings account number of a customer at a bank, and b is the number of years the account has been active.
- A) a is a function of b
 - B) Both
 - C) Neither
 - D) b is a function of a

Answer: D

Use the vertical line test to determine whether y is a function of x .

4)



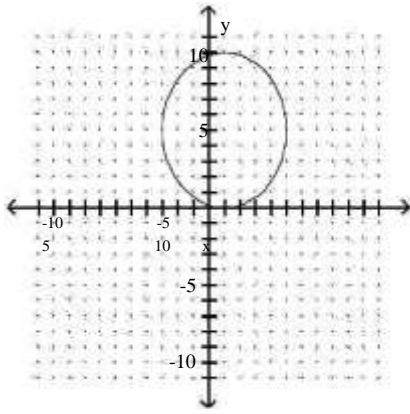
- A) No
- B) Yes

Answer:

B



5)

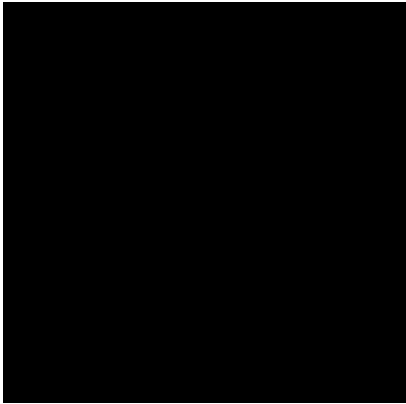


A) Yes

B) No

Answer: B

6)

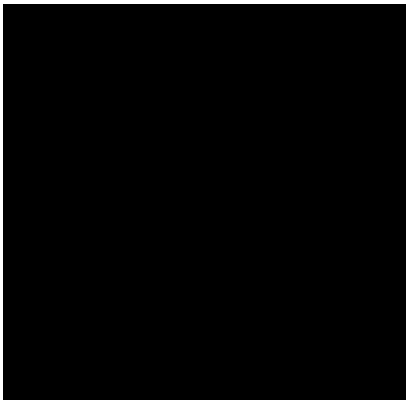


A) No

B) Yes

Answer: B

7)



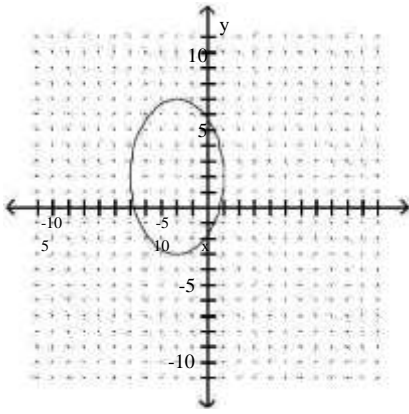
A) No

B) Yes

Answer: A



8)

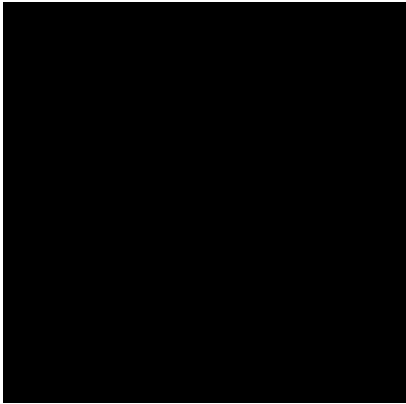


A) Yes

B) No

Answer: B

9)

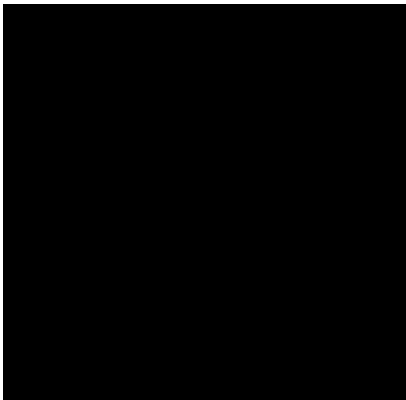


A) Yes

B) No

Answer: A

10)



A) No

B) Yes

Answer:

B



Determine whether the relation is a function.

11) $\{(-1, -2), (3, -3), (6, -9), (7, -2), (12, -4)\}$

A) No

B) Yes

Answer: B

12) $\{(-6, -8), (-3, -4), (3, 6), (3, -8)\}$

A) No

B) Yes

Answer: A

13) $\{(-7, 3), (-7, -4), (2, -4), (5, -5), (10, 9)\}$

A) No

B) Yes

Answer: A

14) $\{(1, -5), (1, 2), (4, 6), (8, 7), (12, 8)\}$

A) Yes

B) No

Answer: B

15) $\{(-3, -8), (-1, -8), (4, -3), (5, 1)\}$

A) Yes

B) No

Answer: A

16) $\{(-8, 3), (-8, 3), (1, -6), (3, -7), (9, -7)\}$

A) No

B) Yes

Answer: A

17) $\{(-8, 4), (-5, -3), (-1, -5), (3, -3)\}$

A) Yes

B) No

Answer: A

18) $\{(-6, 4), (-3, -2), (4, 9), (4, 3)\}$

A) No

B) Yes

Answer: A

19)

x	y
1	
2	5
3	11
4	9

A) Yes

B) No

Answer:

B



20)

x		
y		-8
2		
-2		9
2		2
8		9

- A) No
- B) Yes

Answer:

B

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

21) $y = 7x - 3$

- A) No
- B) Yes

Answer: B

22) $y = -x$

- A) Yes
- B) No

Answer: A

23) $y = x^2 + 1$

A) Yes

B) No

Answer: A

24) $x = y^3$

A) No

B) Yes

Answer: B

25) $y = -2x^2 - 3x - 4$

A) No

B) Yes

Answer: B

26) $y = -14$

A) No

B) Yes

Answer: B

27) $x = y^2 - 6$

A) Yes

B) No

Answer: B

28) $y^2 = (x - 9)(x + 7)$

A) No

B) Yes

Answer: A



29) $y = \sqrt[5]{x}$

A) Yes

B) No

Answer: A

30) $x = |3y|$

A) No

B) Yes

Answer: A

Find the domain and range.

31) $\{(6, 8), (-7, 1), (12, 7), (10, 5), (-5, -2)\}$

A) $D = \{5, 1, 7, 8, -2\}$; $R = \{10, -7, 12, 6, -5\}$

B) $D = \{10, 5, -7, 1, 12\}$; $R = \{7, 6, 8, -5, -2\}$

C) $D = \{7, 6, 8, -5, -2\}$; $R = \{10, 5, -7, 1, 12\}$

D) $D = \{10, -7, 12, 6, -5\}$; $R = \{5, 1, 7, 8, -2\}$

Answer: D

32) $\{(3, -3), (3, -9), (-1, 4), (-9, 6), (1, 1)\}$

A) $D = \{6, 1, 4, -9, -3\}$; $R = \{-9, -9, 1, -1, 3\}$

B) $D = \{-9, 1, -1, 3\}$; $R = \{6, 1, 4, -9, -3\}$

C) $D = \{-9, -4, 1, -1, 3\}$; $R = \{6, 1, 4, -9, -3\}$

D) $D = \{-9, -9, 1, -1, 3\}$; $R = \{6, 1, 4, -9, -3\}$

Answer: B

33) $\{(-2, -3), (-8, 3), (8, 7), (8, 1)\}$

A) $D = \{-8, -2, 8, 8\}$; $R = \{3, -3, 7, 1\}$

B) $D = \{3, -3, 7, 1\}$; $R = \{-8, -2, 8\}$

C) $D = \{-8, -2, 8\}$; $R = \{3, -3, 7, 1\}$

D) $D = \{-8, -2, 8, -8\}$; $R = \{3, -3, 7, 1\}$

Answer: C

34) $\{(2, -1), (-8, 1), (-1, -3), (6, 5)\}$

A) $D = \{-1, 5, 1, -3\}$; $R = \{2, 6, -8, -1\}$

B) $D = \{2, 6, -8, -1\}$; $R = \{-1, 1, 5, 1, -3\}$

C) $D = \{2, 6, -8, -1\}$; $R = \{-1, -1, 5, 1, -3\}$

D) $D = \{2, 6, -8, -1\}$; $R = \{-1, 5, 1, -3\}$

Answer: D

35) $y = 4x - 10$

A) $D = [0, 8]$; $R = (-8, 8)$

B) $D = (-8, 8)$; $R = (-8, 8)$ C)

$D = (-8, 8)$; $R = [-10, 8)$

D) $D = (-8, 8)$; $R = [0,$

8) Answer: B

36) $y = 8x^2$

- A) $D = (-8, 8); R = [8, 8]$ B)
- $D = [0, 8]; R = [-8, 8]$
- C) $D = (-8, 8); R = [0, 8]$ D)
- $D = (-8, 8); R = (-8, 8)$

Answer: C

37) $y = \sqrt{4 + x}$

- A) $D = [8, 8]; R = (-8, 8)$
- B) $D = [-4, 8]; R = [0, 8]$ C)

$D = (-8, 8); R = [-4, 8]$

D) $D = [0, 8]; R = (-8, 8)$

Answer: B

38) $\{(x, y) \mid y = 8\}$

- A) $D = [0, 8]; R = [0, 8]$
- B) $D = (-8, 8); R = (-8, 8)$
- C) $D = (-8, 8); R = \{1\}$
- D) $D = (-8, 8); R = \{8\}$

Answer: D

39) $x = \sqrt{y}$

- A) $D = [0, 8]; R = [0, 8]$
- B) $D = (-8, 8); R = [0, 8]$ C)
- $D = [0, 8]; R = (-8, 8)$ D) D
- $= (-8, 8); R = (-8, 8)$

Answer: C

Evaluate.

40) If $f(x) = (x - 3)^2$, find $f(-4)$.

- A) 1
- B) -49
- C) -14
- D) 49

Answer: D

41) If $f(x) = -x - 8$, find $f(7)$.

- A) -1
- B) 15
- C) -15
- D) 1

Answer: A

42) If $f(x) = -3x^2 - 4x + 5$, find $f(-6)$.

- A) -79
- B) -107
- C) -84
- D) 47

Answer: A



43) If $f(x) = x^3 - 3x^2 + 5x + 3$, find $f(-4)$.

- A) 11
- B) -132
- C) -40
- D) -129

Answer: D

44) If $f = \{(3, 3), (5, -1), (6, 5)\}$ and $g(x) = 2x + 7$, find $f(5) + g(5)$.

- A) 44
- B) 22
- C) 16
- D) 8

Answer: C

45) Find $g(a + 1)$ when $g(x) = \frac{1}{2}x + 5$.

A) $\frac{1}{2}a - 2$

B) $\frac{a - 11}{2}$

C) $\frac{1}{2}a + 5$

D) $\frac{a + 11}{2}$

Answer: D

46) Find $g(a - 1)$ when $g(x) = 5x - 4$.

- A) $5a - 4$
- B) $5a + 1$
- C) $5a - 9$

D) $\frac{1}{5}a - 4$

Answer: C

47) Find $f(a + 2)$ when $f(x) = x^2 - 1$.

A) $a^2 + 4a + 3$

B) $a^2 + 4a + 4$

C) $a^2 + 4$

D) $a^2 + 1$

Answer: A

48) Find $f(k - 1)$ when $f(x) = 4x^2 + 2x + 4$.

A) $4k^2 - 6k + 6$

B) $4k^2 + 18k + 10$

C) $-6k^2 + 4k + 6$

D) $4k^2 - 6k + 10$

Answer: A



49) If $f(x) = 4x^2 + x$, find $f(x+h) - f(x)$.

A) $8xh + 4h^2 + 2x + h$

B) $8xh + 4h^2 + h$

C) $4h^2 + h$

D) $8xh + 4h^2$

Answer: B

Solve the problem.

50) A deep sea diving bell is being lowered at a constant rate. After 10 minutes, the bell is at a depth of 500 feet. After 50 minutes the bell is at a depth of 1400 feet. What is the average rate of lowering per minute? A)

18.0 ft per minute

B) 22.5 ft per minute

C) 0.04 ft per minute

D) 28.0 ft per minute

Answer: B

51) In January 1983, Anna starts a new job and makes an annual salary of \$38,000. By January 1986 her annual salary has increased to \$46,300, and by January 1991 it has increased to \$167,300. What is the average rate of change of her salary between January 1986 and January 1991?

A) \$16,163 per year

B) \$24,200 per year

C) \$9680 per year

D) \$25,860 per year

Answer: B

Find the difference quotient, $\frac{f(x+h) - f(x)}{h}$, for the function and simplify it.

52) $f(x) = 8x - 13$

A) $-8h$

B) $\frac{13}{h}$

C) 8

D) 13

Answer: C

53) $g(x) = 4x^2 + 15x - 5$

A) $4x + 6 + 8h$

B) $8xh + 15h + 15h^2$

C) $8x + 15 + 4h$

D) $8x + 15$

Answer: C



$$54) q(x) = \frac{-1}{x+12}$$

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

$$B) \frac{-12}{(x+h+12)(x+12)}$$

$$C) \frac{-1}{(x+h+12)(x+12)}$$

$$D) \frac{1}{(x+h+12)(x+12)}$$

Answer: C

$$55) a(x) = \frac{\sqrt{12x+36}}{2\sqrt{x+3}}$$

$$A) \frac{2\sqrt{x+3}}{3}$$

$$B) \frac{\sqrt{x+h+3} - \sqrt{x+3}}{2\sqrt{3}}$$

$$C) \frac{\sqrt{x+h+3} + \sqrt{x+3}}{6\sqrt{3}}$$

$$D) \frac{\sqrt{x+h+3} + \sqrt{x+3}}{3}$$

Answer: C

$$56) p(x) = 3 - 8x^3$$

$$A) -8(3x^2 - 3x - h)$$

$$B) -8(3x^2 + 3xh + h^2)$$

$$C) -9x^2$$

$$D) -8(x^2 - xh - h^2)$$

Answer: B

Solve the problem.

57) Suppose that a rectangular yard has a width of x and a length of $6x$. Write the perimeter P as a function of x .

$$A) P = 6x^2$$

$$B) P = 14x^2$$

$$C) P = 7x$$

$$D) P = 14x$$

Answer: D



58) Suppose that a circular coin has a circumference of C , a radius of r , and a diameter of d . Write C as a function of d .

A) $C = \frac{d}{p}$

B) $C = pd^2$

C) $C = 2pd$

D) $C = pd$

Answer: D

59) Elissa wants to set up a rectangular dog run in her backyard. She has 24 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 .

A) $A = 11x - x^2$

B) $A = 12x - x^2$

C) $A = 14x^2 - x$

D) $A = 13x - x^2$

Answer: B

60) Bob wants to fence in a rectangular garden in his yard. He has 62 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 .

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

B) $A = 30x - x^2$

C) $A = 31x - x^2$

D) $A = 32x - x^2$

Answer: C

61) Sue wants to put a rectangular garden on her property using 60 meters of fencing. There is a 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) $A = 30x^2 - x$

B) $A = 30x - \frac{1}{2}x^2$

C) $A = 31x - 2x^2$

D) $A = 29x - \frac{1}{4}x^2$

Answer: B

62) A rectangular sign is being designed so that the length of its base, in feet, is 18 feet less than 4 times the height, h . Express the area of the sign as a function of h .

A) $A = -18h + h^2$

B) $A = -18h^2 + 2h$

C) $A = -18h + 4h^2$

D) $A = 18h - 2h^2$

Answer: C



- 63) Assume that the sales of a certain appliance dealer are approximated by a linear function. Suppose that sales were \$13,500 in 1982 and \$52,500 in 1987. Let $x = 0$ represent 1982. Find the equation giving yearly sales $S(x)$. A) $S(x) = 39,000x + 13,500$
B) $S(x) = 7800x + 52,500$
C) $S(x) = 39,000x + 52,500$
D) $S(x) = 7800x + 13,500$ Answer: D

- 64) Let $C(x) = 600 + 60x$ be the cost to manufacture x items. Find the average cost per item, to the nearest dollar, to produce 30 items. A) \$80
B) \$1320
C) \$330
D) \$315
Answer: A

- 65) Let $R(x) = -13x + 163$ represent the number of students present in a large class, where x represents the number of hours of study required weekly. What is the rate of change of the number of students in the class with respect to the number of hours of study? A) 163
B) 13
C) -163
D) -13
Answer: D

- 66) 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 300 parts are produced, the cost is \$1300. What is the average cost per part? A) \$3.33 per part
B) \$0.20 per part
C) \$6.00 per part
D) \$5.00 per part
Answer: D

- 67) Suppose the sales of a particular brand of appliance satisfy the relationship $S(x) = 70x + 5800$, where $S(x)$ represents the number of sales in year x , with $x = 0$ corresponding to 1982. In what year would the sales be 6360? A) 1991
B) 1990
C) 1988
D) 1993
Answer: B

- 68) The mathematical model $C = 700x + 50,000$ represents the cost in dollars a company has in manufacturing x items during a month. How many items were produced if costs reached \$470,000? A) 469,300 items
B) 600 items
C) 529 items
D) 743 items
Answer: B



69) The revenue in dollars from the sale of concert tickets at x dollars each is given by the function

$R(x) = 18,000x - 500x^2$. Find the difference quotient when $x = 24$ and $h = 0.1$. Interpret the result. A) At 24 per ticket, revenue is decreasing at \$6050 per dollar change in ticket price.

B) At 24 per ticket, revenue is increasing at \$605 per dollar change in ticket price. C) At 24 per ticket, revenue is increasing at \$6050 per dollar change in ticket price.

D) At 24 per ticket, revenue is decreasing at \$605 per dollar change in ticket price.

Answer: A

70) The amount of tin A (in square inches) needed to make a tin can with radius r inches and volume 25 cubic

inches can be found by the function $A(r) = \frac{50}{r} + 2\pi r^2$. Find the difference quotient when $r = 2.6$ in. and $h = 0.1$.

Use 3.14 for π . Interpret the result.

A) At $r = 2.6$ in., A is increasing at 262 in.^2 per 1 in. increase in r . B)

At $r = 2.6$ in., A is decreasing at 26.2 in.^2 per 1 in. increase in r . C) At

$r = 2.6$ in., A is decreasing at 262 in.^2 per 1 in. increase in r . D) At $r =$

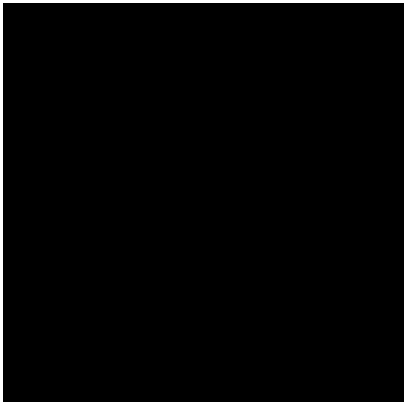
2.6 in., A is increasing at 26.2 in.^2 per 1 in. increase in r .

Answer: D

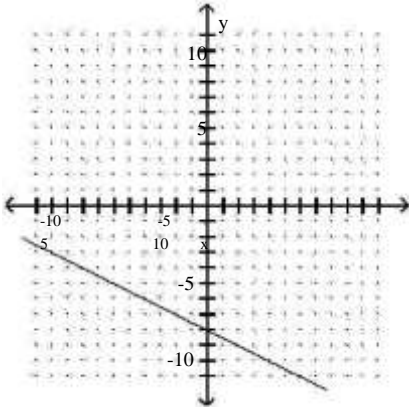
Graph the equation by plotting ordered pairs of numbers. 71) $2x = y + 8$



A)



B)



C)



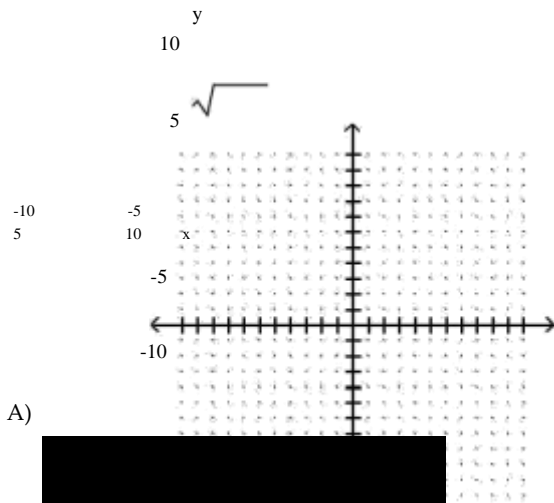
D)



Answer: C



72) $y = \frac{x + 7}{7}$



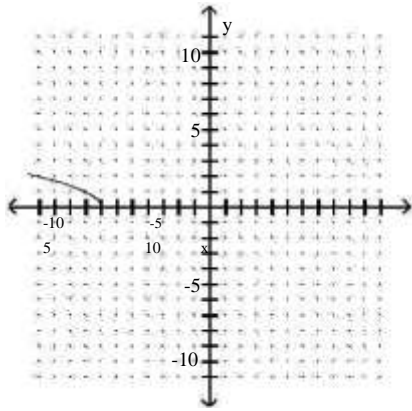
A)

B)

C)



D)

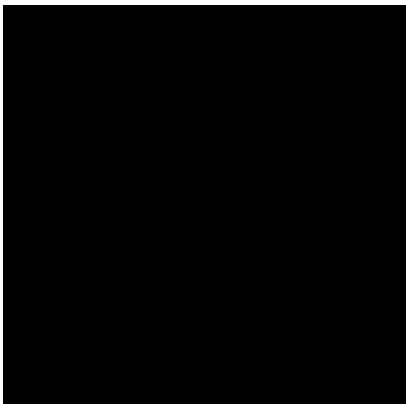


Answer: B

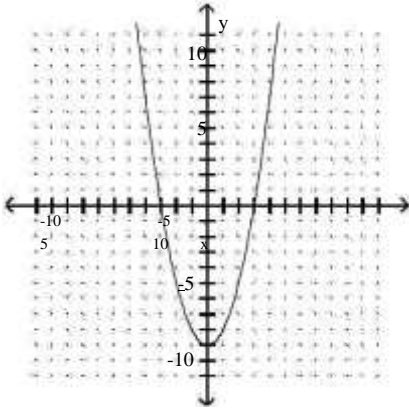
73) $y = -\sqrt{9 - x}$



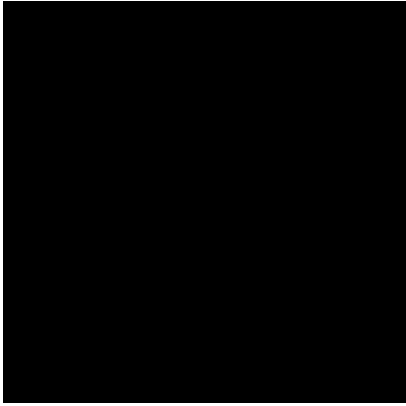
A)



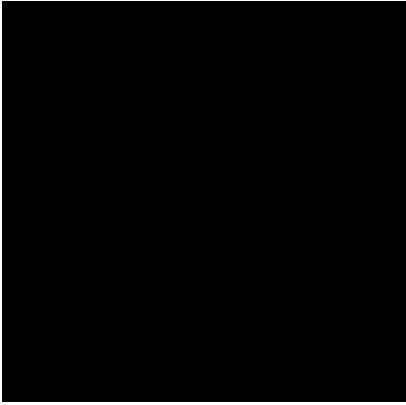
B)



C)



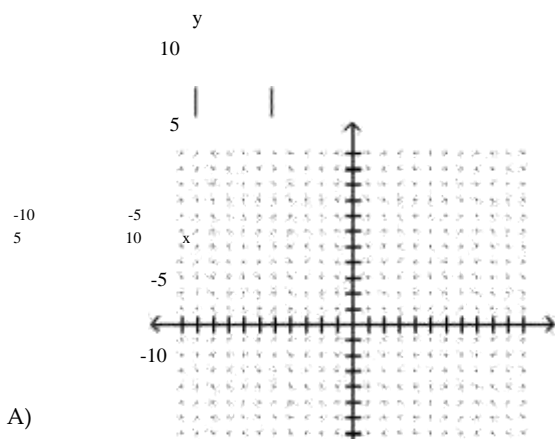
D)



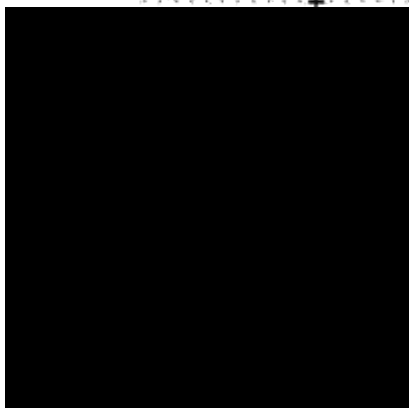
Answer: D



74) $y = 9 - x$



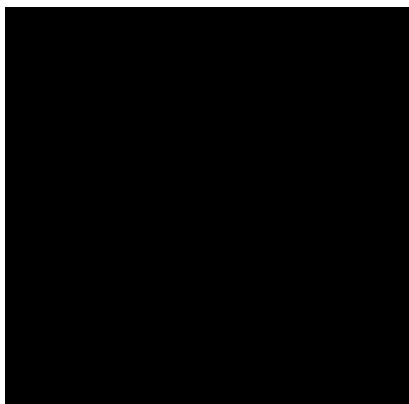
A)



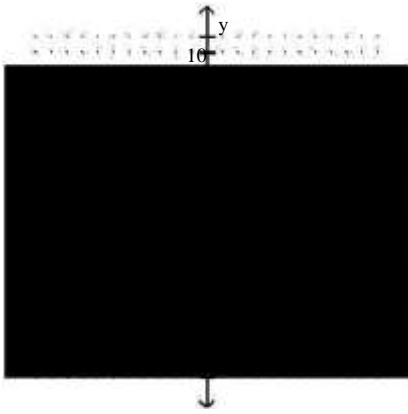
B)



C)

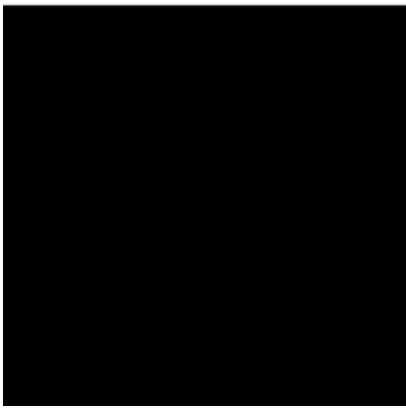


D)

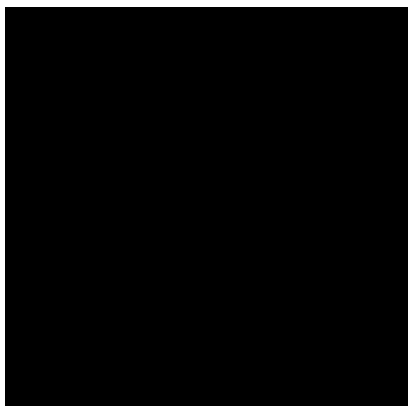


Answer: A

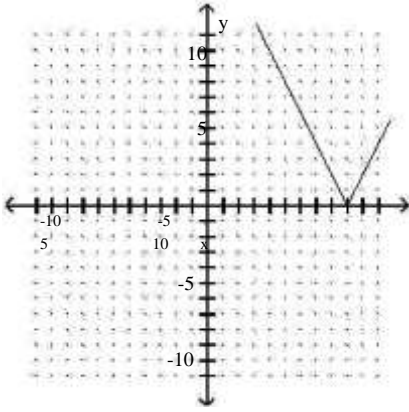
75) $y = 2|x| - 9$



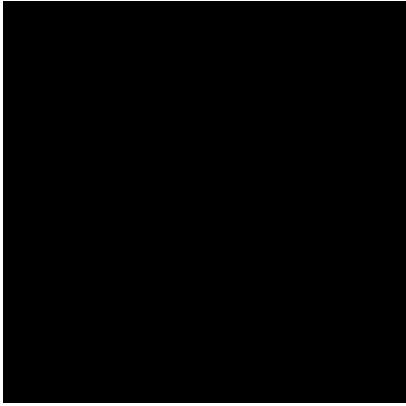
A)



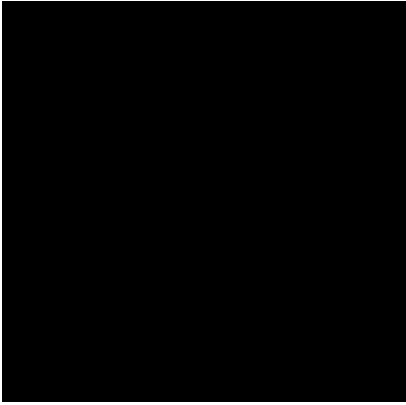
B)



C)



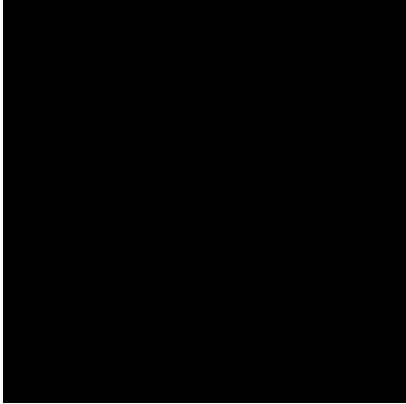
D)



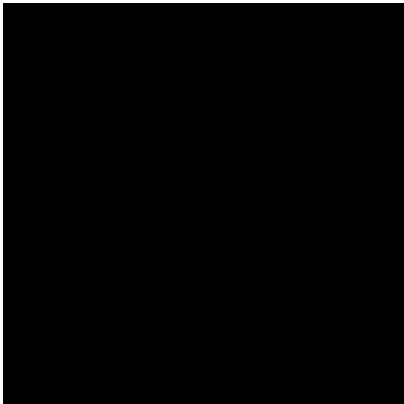
Answer: C



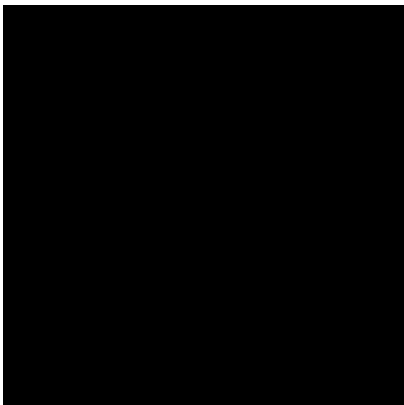
$$76) y = -5(x-1)^{\frac{1}{3}}$$



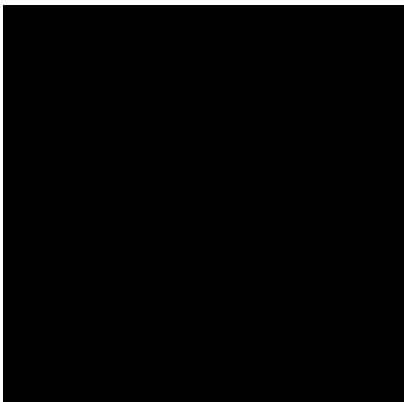
A)



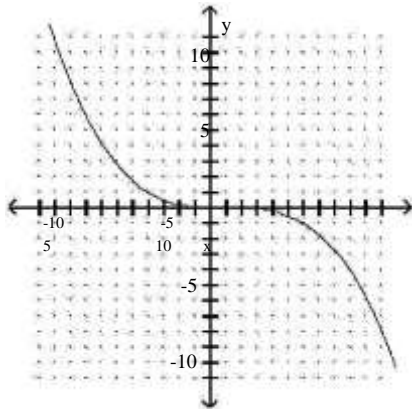
B)



C)

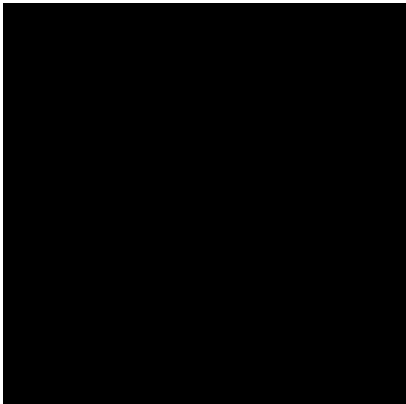


D)

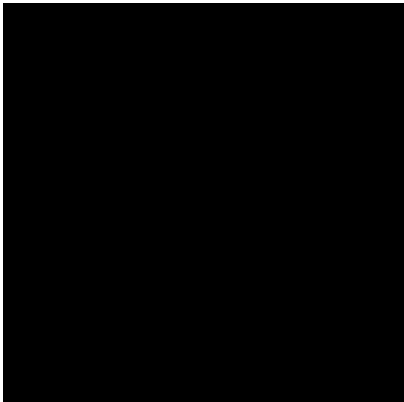


Answer: C

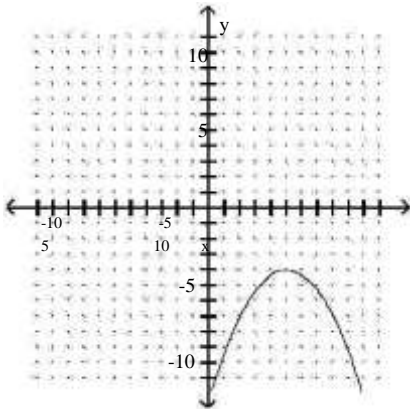
$$77) y = -3(x - 5)^2 - 4$$



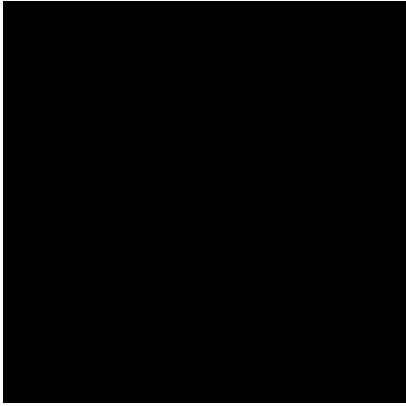
A)



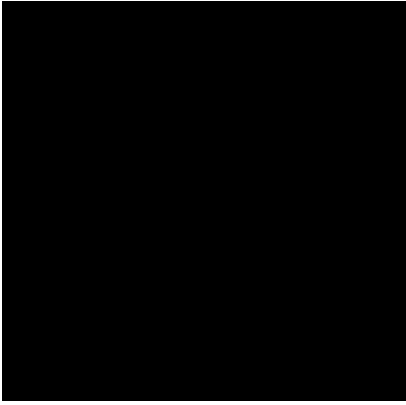
B)



C)



D)

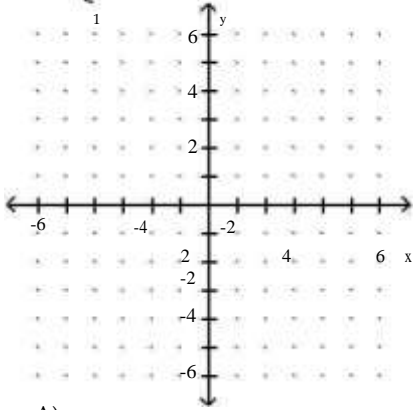


Answer: B

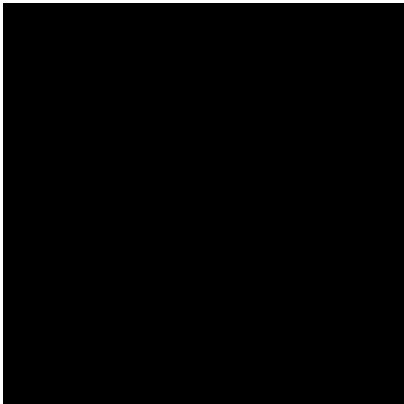
Graph the function.



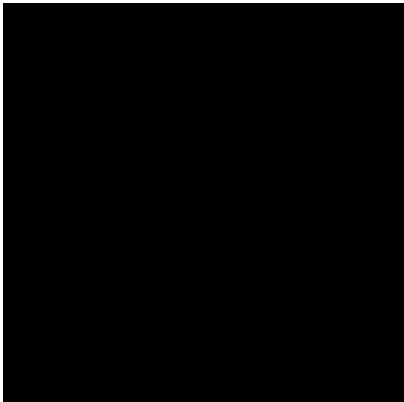
$$78) f(x) = \begin{cases} 2 & \text{for } x = 1 \\ 3 - x & \text{for } x < 1 \end{cases}$$



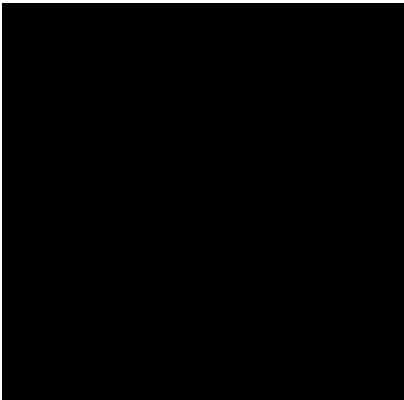
A)



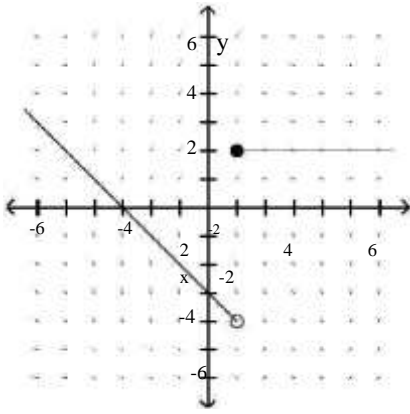
B)



C)

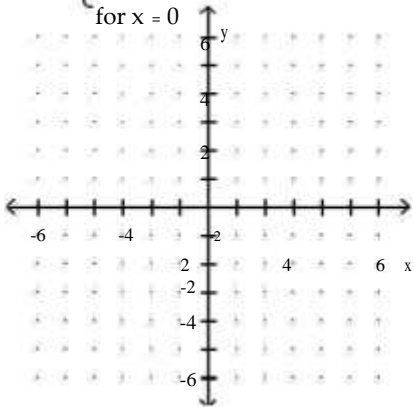


D)



Answer: D

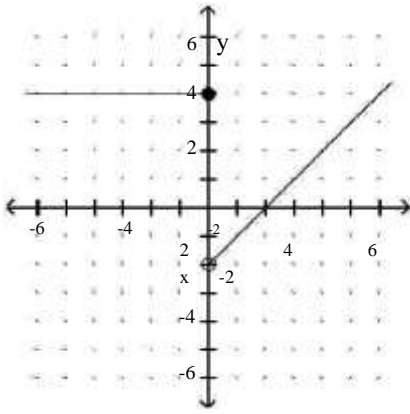
$$79) f(x) = \begin{cases} x - 2 & \text{for } x > 4 \\ 0 & \text{for } x \leq 4 \end{cases}$$



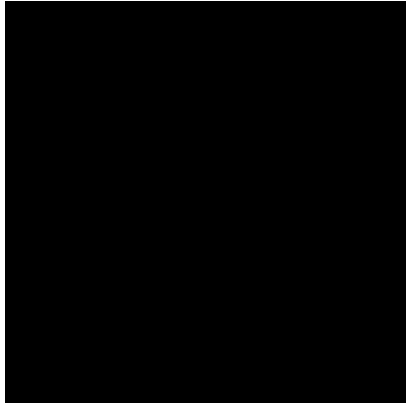
A)



B)



C)



D)

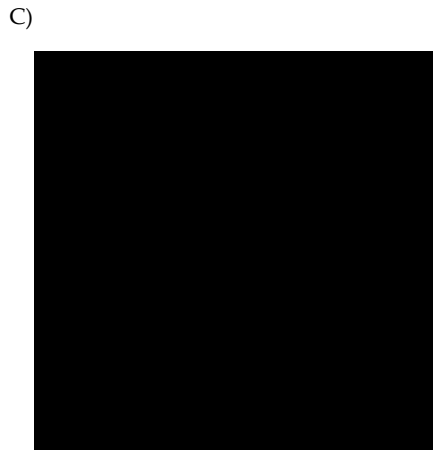
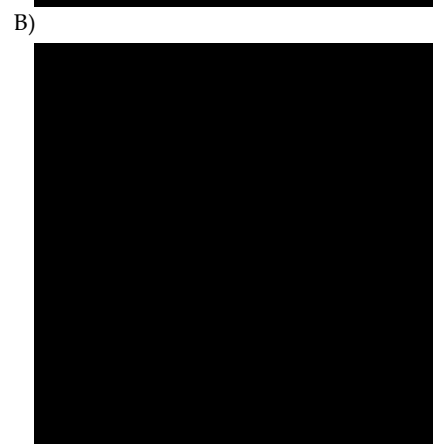
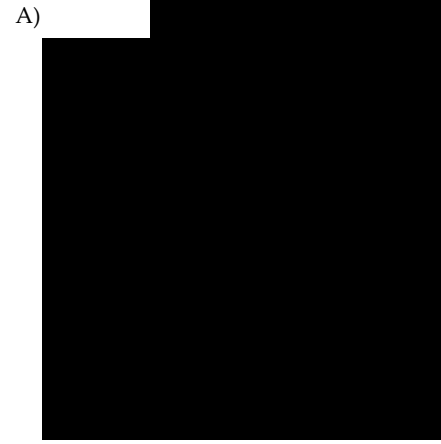
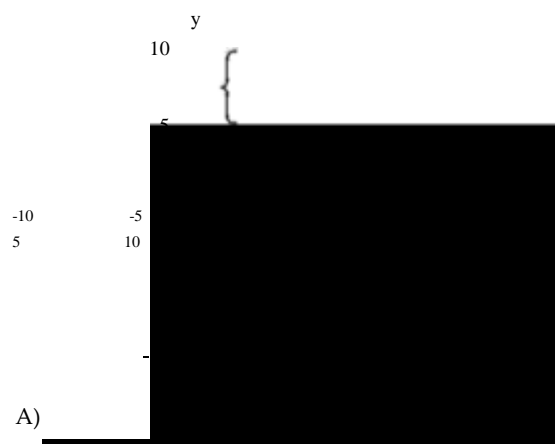


Answer:

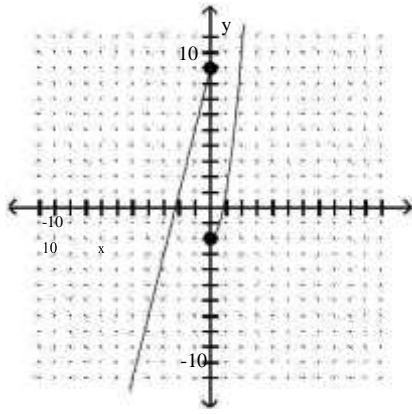
B



80) $f(x) = \begin{cases} 4x + 9 & \text{for } x < 0 \\ 3x^2 - 2 & \text{for } x \geq 0 \end{cases}$

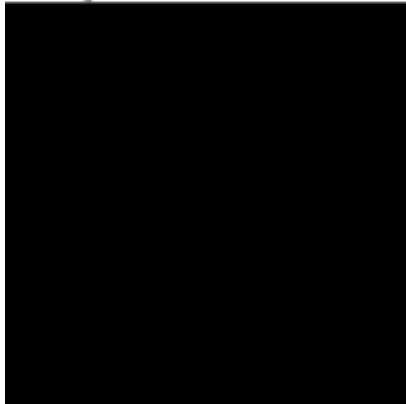


D)

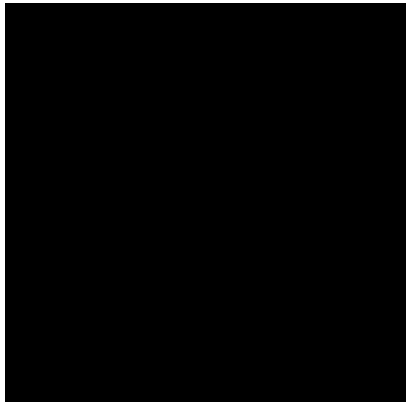


Answer: A

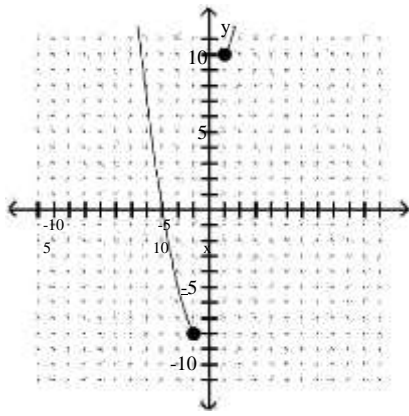
$$81) f(x) = \begin{cases} x^2 - 9 & \text{for } x < -1 \\ 0 & \text{for } -1 \leq x \leq 1 \\ x^2 + 9 & \text{for } x > 1 \end{cases}$$



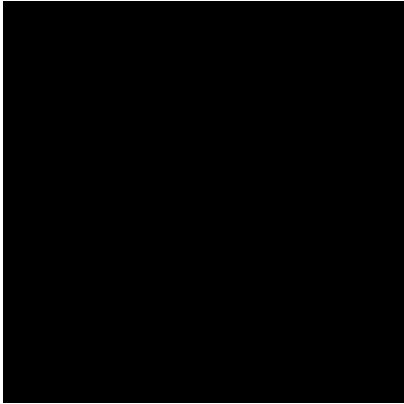
A)



B)



C)



D)



Answer: D



82) $f(x) = |x| + 4$ for $x < 0$
 $f(x) = 0$ for $x = 0$
 $f(x) = y$ for $x > 0$

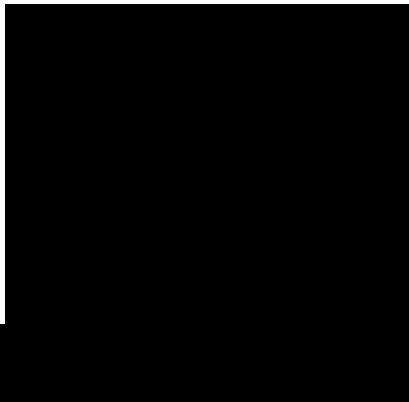
10
 5
 }

-10 -5
 5 10

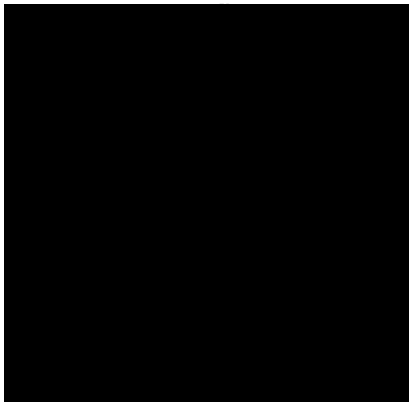
A)



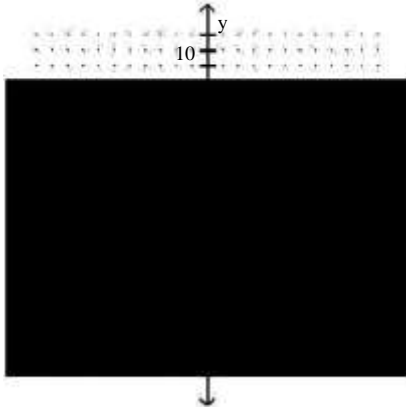
B)



C)

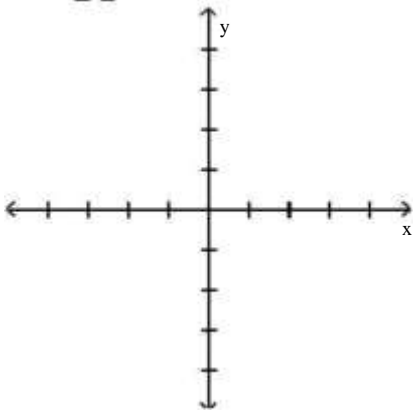


D)

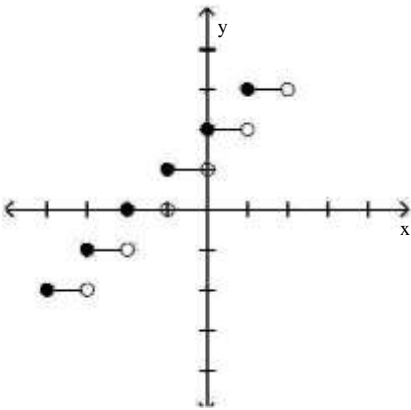


Answer: A

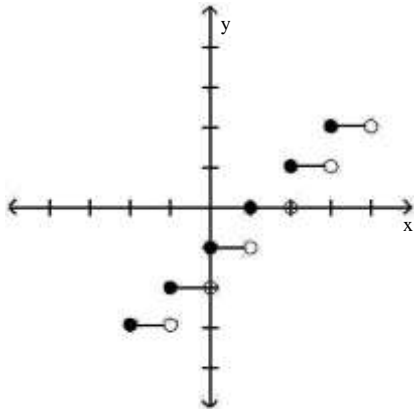
83) $f(x) = \lfloor x \rfloor + 1$



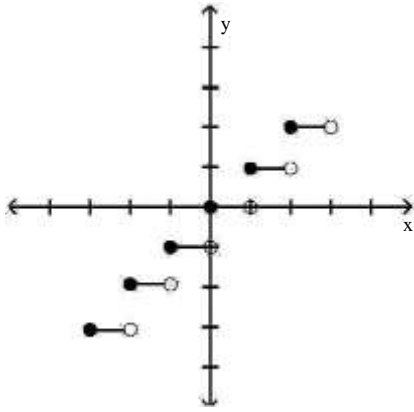
A)



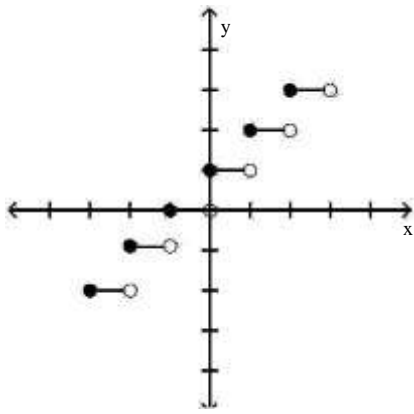
B)



C)



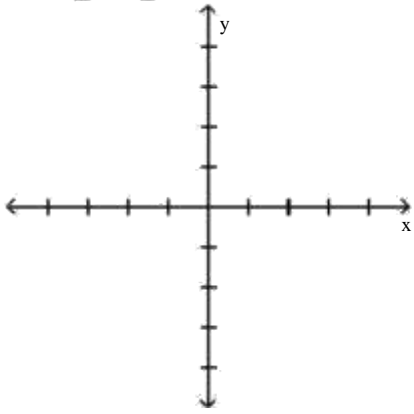
D)



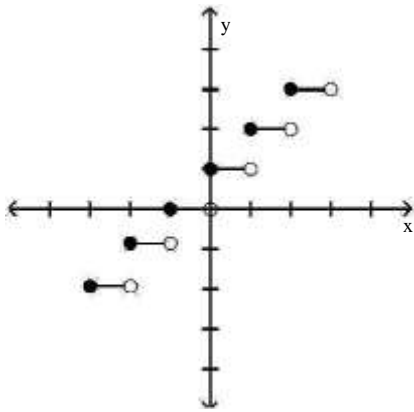
Answer: D



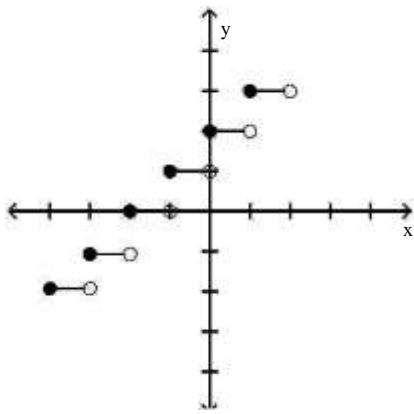
84) $f(x) = \lfloor x + 1 \rfloor$



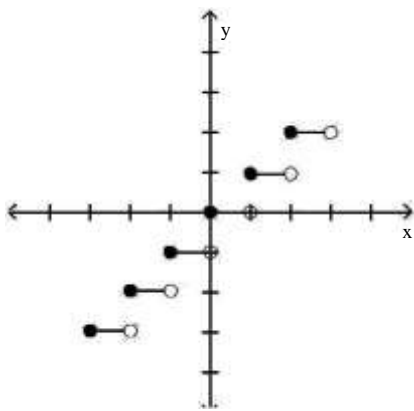
A)



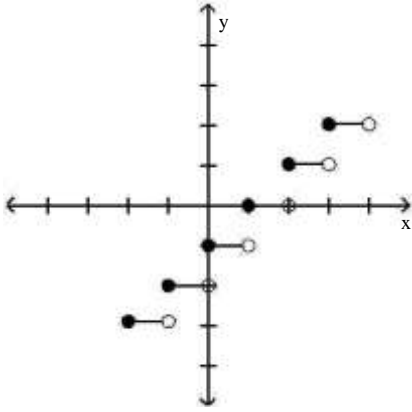
B)



C)

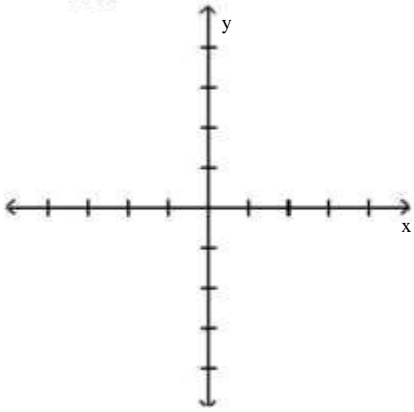


D)

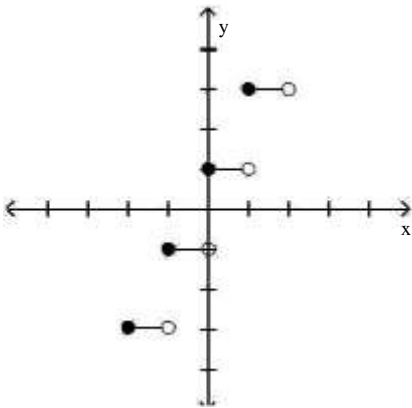


Answer: A

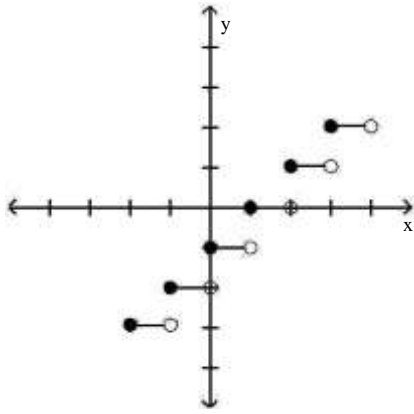
85) $f(x) = \lfloor x \rfloor - 1$



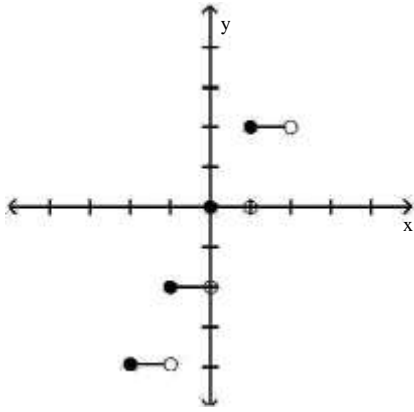
A)



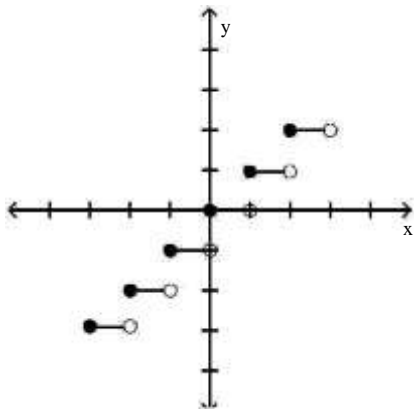
B)



C)



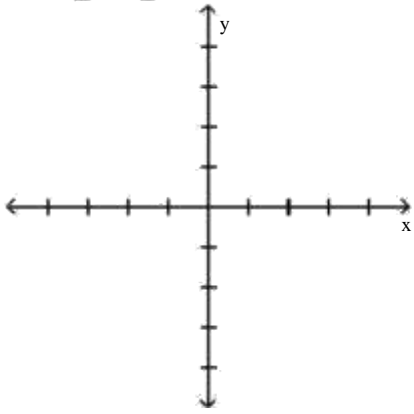
D)



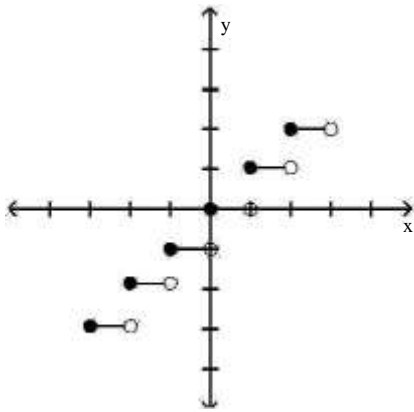
Answer:
B



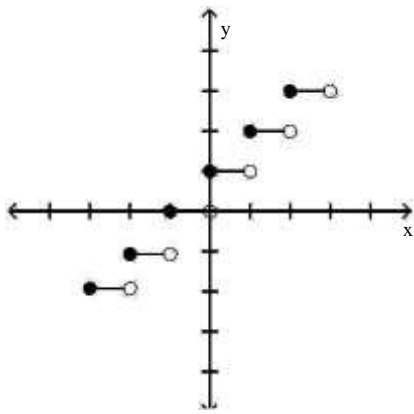
86) $f(x) = \lfloor x - 1 \rfloor$



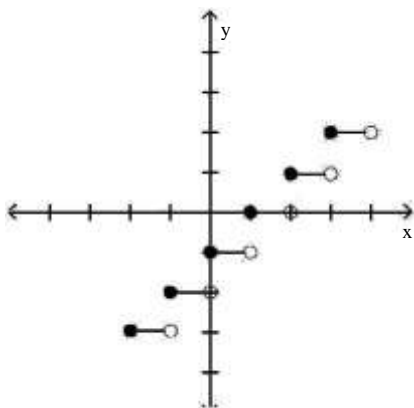
A)



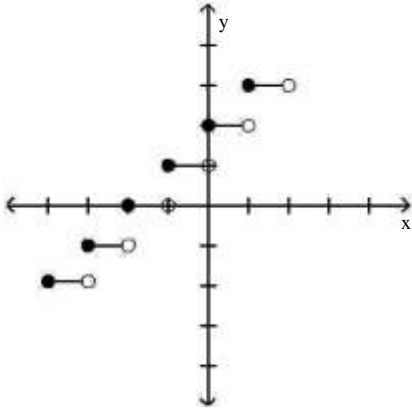
B)



C)

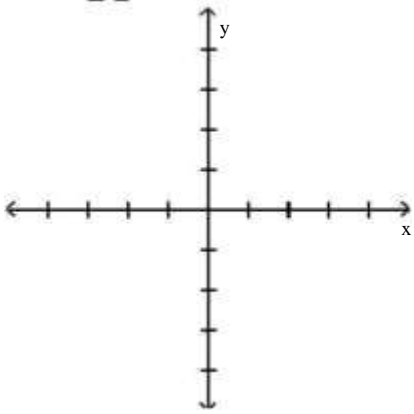


D)

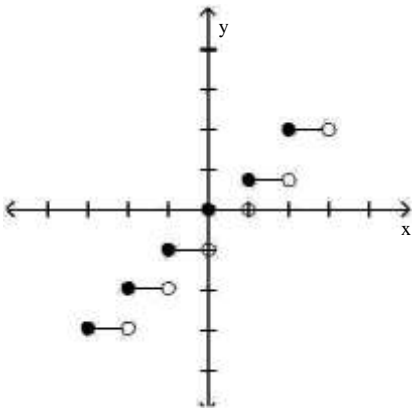


Answer: C

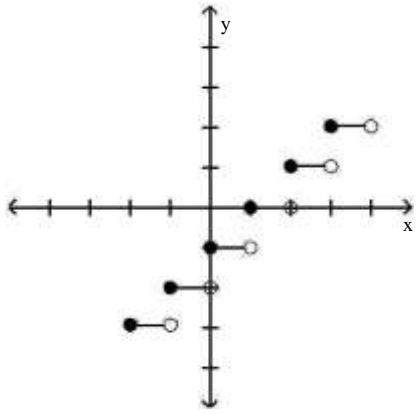
87) $f(x) = 2 \lfloor x \rfloor$



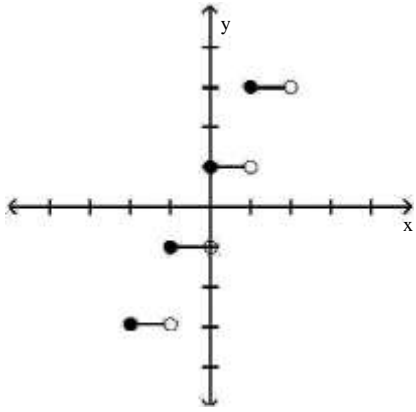
A)



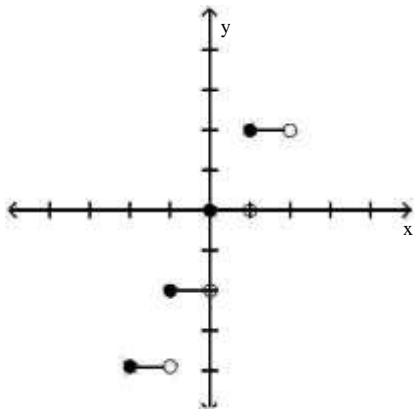
B)



C)



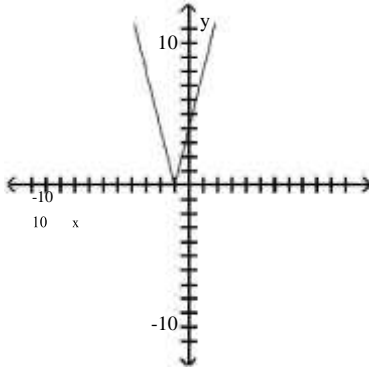
D)



Answer: D



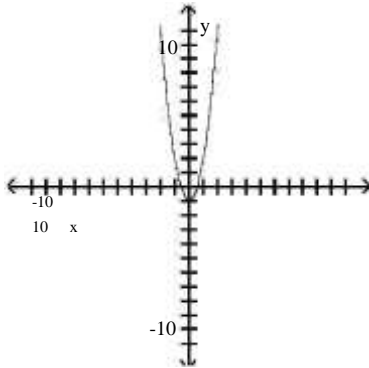
Determine the intervals on which the function is increasing, decreasing, and constant88).



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

Answer: C

89)

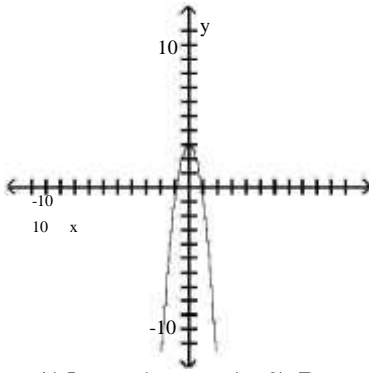


- A) Increasing on $(\infty, 0)$; Decreasing on $(0, -\infty)$
- B) Increasing on $(-\infty, 0)$; Decreasing on $(-\infty, 0)$
- C) Increasing on $(-\infty, 0)$; Decreasing on $(0, \infty)$
- D) Increasing on $(0, \infty)$; Decreasing on $(-\infty, 0)$

Answer: D



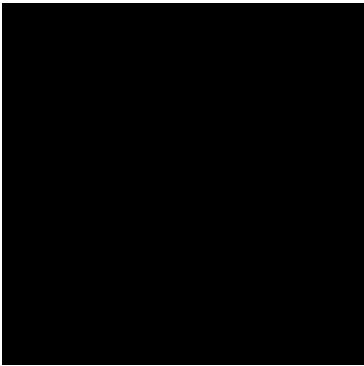
90)



- A) Increasing on $(-8, 0)$; Decreasing on $(0, 8)$
- B) Increasing on $(-8, 0)$; Decreasing on $(-8, 0)$
- C) Increasing on $(0, 8)$; Decreasing on $(-8, 0)$
- D) Increasing on $(8, 0)$; Decreasing on $(0, -8)$

Answer: A

91)



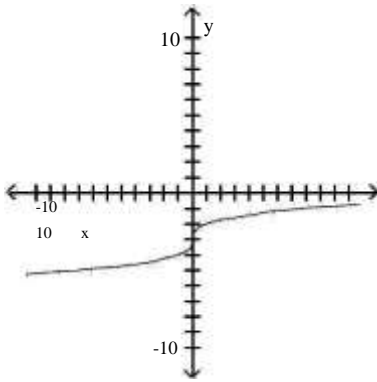
- A) Increasing on $(-2, 8)$; Decreasing on $(-2, 8)$ B)
- Increasing on $(-8, -2)$; Decreasing on $(-2, 8)$ C)
- Increasing on $(-8, -2)$; Decreasing on $(-8, -2)$
- D) Increasing on $(-2, 8)$; Decreasing on $(-8, -2)$

Answer:

B



92)



A) Increasing on $(-8, 0)$; Decreasing on $(0, 8)$

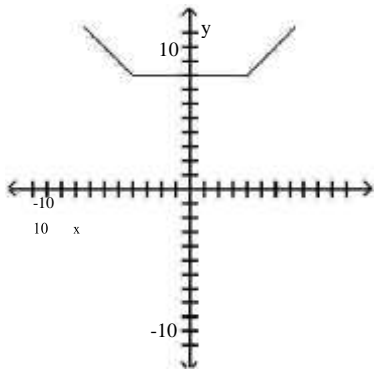
B) Decreasing on $(-8, 8)$

C) Increasing on $(-8, 8)$

D) Increasing on $(0, 8)$; Decreasing on $(-8, 0)$

Answer: C

93)



A) Increasing on $(4, 8)$; Decreasing on $(-4, 8)$; Constant on $(-4, 4)$ B)

Increasing on $(4, 8)$; Decreasing on $(-8, -4)$; Constant on $(-4, 4)$ C)

Increasing on $(-8, 4)$; Decreasing on $(-4, 8)$; Constant on $(4, 8)$ D)

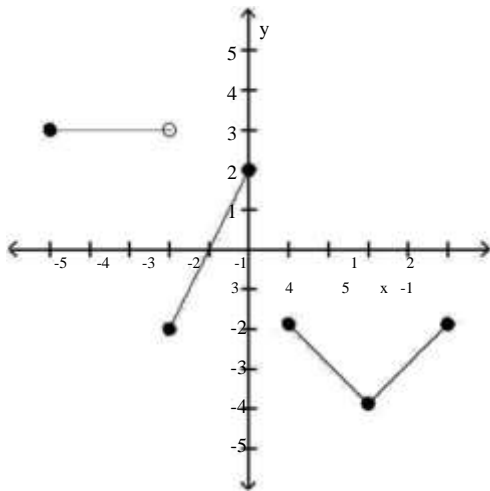
Increasing on $(-8, 4)$; Decreasing on $(-8, -4)$; Constant on $(4, 8)$

Answer:

B



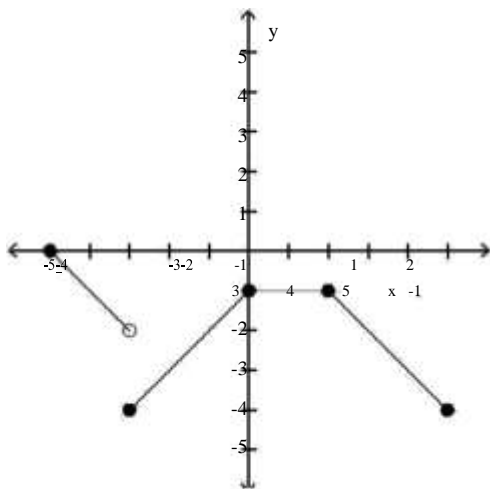
94)



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

Answer: A

95)



- 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 $(-5, -3)$ and $(2, 5)$; Decreasing on $(-3, 0)$; Constant on $(0, 2)$
- D) Increasing on $(-3, 1)$; Decreasing on $(-5, -3)$ and $(0, 5)$; Constant on $(1, 2)$

Answer: B

Find the domain and range.

96) $f(x) = \sqrt{x^2 - 36}$

- A) $D = [-6, 6], R = [0, 8)$
- B) $D = (-8, 8), R = [0, 8)$
- C) $D = (-8, -6] \cup [6, 8), R = (-8, 8)$
- D) $D = (-8, -6] \cup [6, 8), R = [0, 8)$

Answer: D



$$97) f(x) = \left| \frac{x+6}{x+6} \right|$$

A) $D = (-8, -6) \cup (-6, 8), R = [-1, 1]$

B) $D = (-8, -6) \cup (-6, 8), R = [0, 8]$ C)

$D = (-8, 6) \cup (6, 8), R = [-1, 1]$

D) $D = (-8, 6) \cup (6, 8), R = [8, 8]$

Answer: A

Identify the intervals on which the given function is increasing, decreasing, or constant. 98

$$f(x) = \begin{cases} x+2 & \text{for } x < -6 \\ \sqrt{36-x^2} & \text{for } -6 \leq x \leq 6 \\ -5 & \text{for } x > 6 \end{cases}$$

A) inc $(-8, -6), (-6, 0)$

dec $(0, 6), (6, 8)$

B) inc $(-8, -6), (-6, 0)$

dec $(0, 6)$ const

$(6, 8)$

C) inc $(-8, -6), (0, 6)$

dec $(-6, 0)$

const $(6, 8)$

D) inc $(-6, 0)$

dec $(0, 6)$

const $(-8, -6), (6, 8)$

Answer: B

99)

$$f(x) = \begin{cases} (x+3)^2 & \text{for } x < 0 \\ x-5 & \text{for } x \geq 0 \end{cases}$$

A) inc $(5, 8)$

dec $(-8, 0), (0, 5)$

B) inc $(-3, 0)$

dec $(-8, -3)$

const $(0, 8)$

C) inc $(-8, -3), (0, 5)$

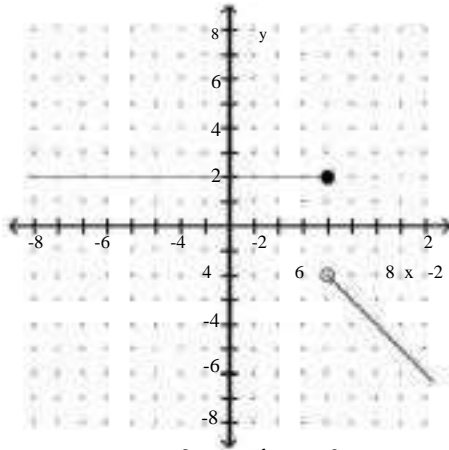
dec $(-3, 0), (5, 8)$

D) inc $(-3, 0), (5, 8)$

dec $(-8, -3), (0, 5)$

Answer: D

Write a piecewise function for the given graph.100)

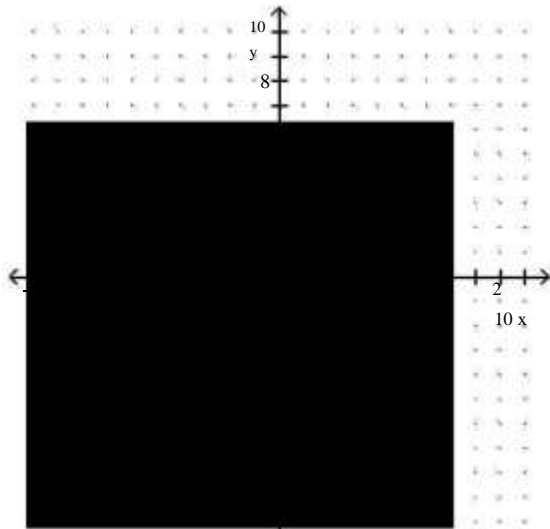


- A) $f(x) = \begin{cases} 2 & \text{for } x < 0 \\ 2 - x & \text{for } x = 0 \end{cases}$
- B) $f(x) = \begin{cases} 2 & \text{for } x = 4 \\ 2 - x & \text{for } x > 4 \end{cases}$
- C) $f(x) = \begin{cases} 2 & \text{for } x < 4 \\ x - 2 & \text{for } x = 4 \end{cases}$
- D) $f(x) = \begin{cases} 2 & \text{for } x = 4 \\ -2 - x & \text{for } x > 4 \end{cases}$

Answer: B



101)



- A) $f(x) = \begin{cases} x + 7 & \text{for } x < -1 \\ 4 - x & \text{for } x = -1 \end{cases}$
- B) $f(x) = \begin{cases} x + 7 & \text{for } x < -1 \\ 4 - 2x & \text{for } x = -1 \end{cases}$
- C) $f(x) = \begin{cases} x + 6 & \text{for } x < -1 \\ 6 - 2x & \text{for } x = -1 \end{cases}$
- D) $f(x) = \begin{cases} x + 7 & \text{for } x < -1 \\ -2x & \text{for } x = -1 \end{cases}$

Answer: B

Use the minimum and maximum features of a graphing calculator to find approximately the intervals on which the function is increasing or decreasing.

of a graphing calculator to find approximately the intervals on which Round your values to two decimal places, if necessary.

102) $y = -6x^2 - 2x + 8$

- A) inc (-1.33, -0.17), dec (-0.17, -1.33, 8)
- B) dec (-8, -0.17), inc (-0.17, 8)
- C) inc (-8, -1.33), dec (-1.33, 8)
- D) inc (-8, -0.17), dec (-0.17, 8)

Answer: D

103) $y = x^4 - 11x^2 + 24$

- A) dec (-8, -2.83), (-1.73, 1.73), (2.83, 8)
inc (-2.83, -1.73), (1.73, 2.83)
- B) dec (-8, -2.35), (2.35, 8)
inc (-2.35, 2.35)
- C) inc (-8, -2.35), (0, 2.35)
dec (-2.35, 0), (2.35, 8)
- D) dec (-8, -2.35), (0, 2.35)
inc (-2.35, 0), (2.35, 8)

Answer: D



$$104) y = |x + 2| + |x - 6|$$

- 10 A) inc (-8, -2), dec (6, 8)

B) inc (6, 8), dec (-8, -2)

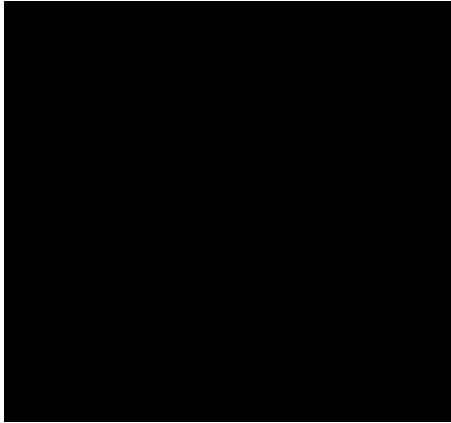
C) inc (2, 8), dec (-8, 6)

D) inc (10, 8), dec (-8, 2)

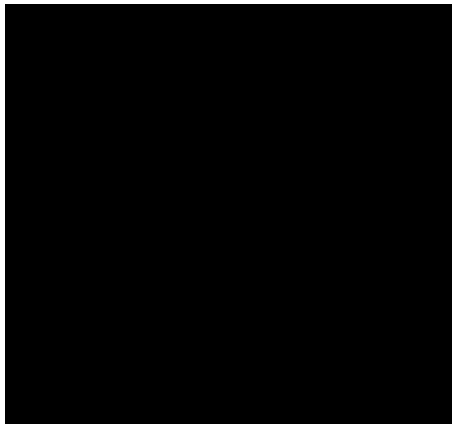
Answer: B

Sketch a graph to represent the situation described.

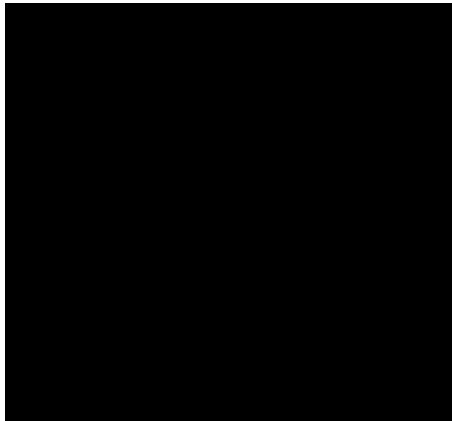
105) Subscriptions to a magazine fell rapidly during the first three months of the year 2000. During the next three months, subscriptions continued to fall but more and more slowly. After that, subscriptions were constant for two months, and then for the next two months subscriptions rose again, very slowly at first and then more quickly.



A)



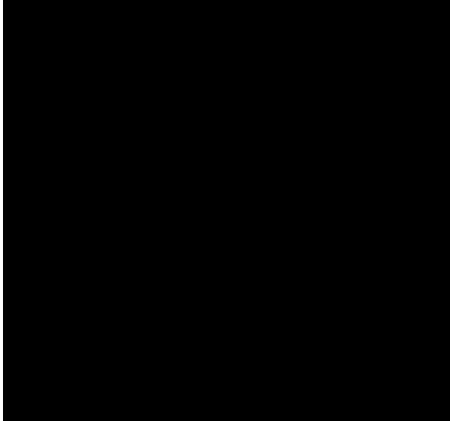
B)



C)

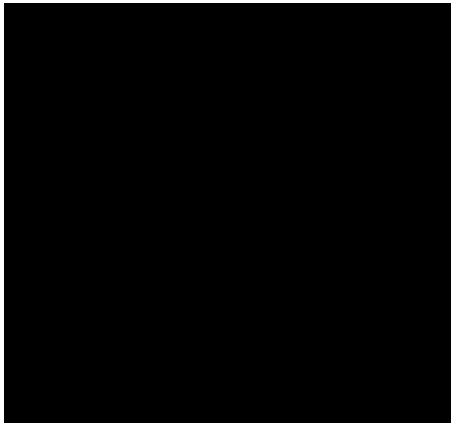


D)

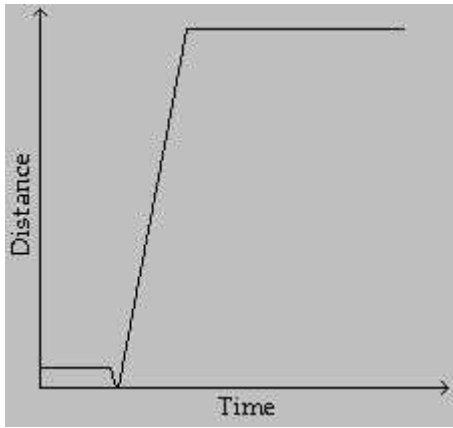


Answer: C

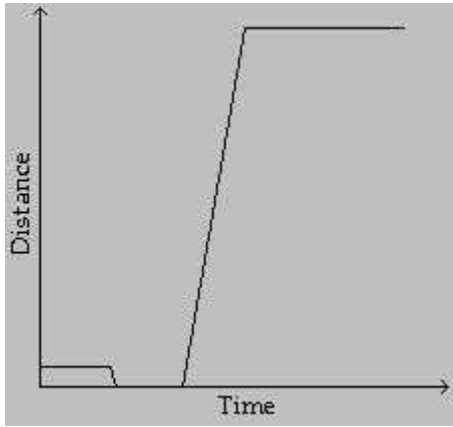
- 106) Janice jogged twice around a circular race track, which took her 4 minutes, then jogged to the center of the track and rested for 4 minutes before walking home slowly at a constant rate, which took her 12 minutes. Sketch a graph of her distance from the center of the race track as a function of time. Assume that the route she takes home is a straight line from the center of the race track.



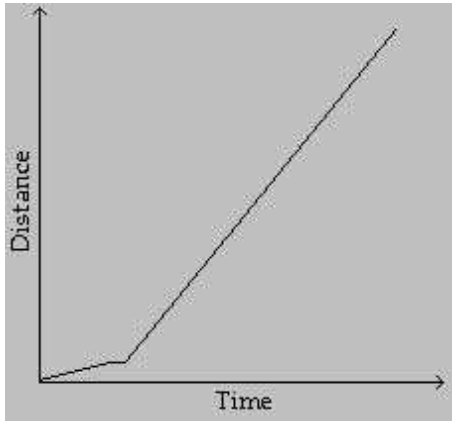
A)



B)



C)



D)



Answer: D

Solve the problem.

107) Employees of a publishing company received an increase in salary of 4% plus a bonus of \$900. Let $S(x)$ represent the new salary in terms of the previous salary x . Find the value of $S(15,000)$. A)

\$21,900

B) \$16,500

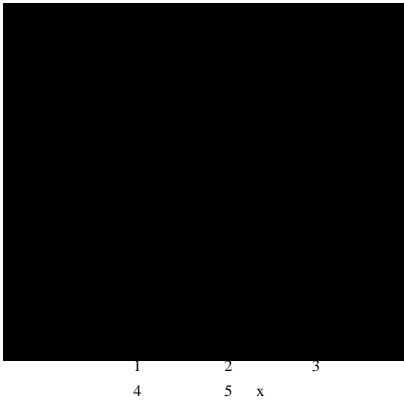
C) \$15,900

D) \$13,558

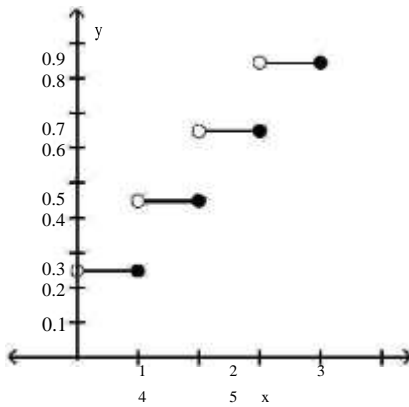
Answer: B



108) Assume it costs 25 cents to mail a letter weighing one ounce or less, and then 20 cents for each additional ounce or fraction of an ounce. Let $L(x)$ be the cost of mailing a letter weighing x ounces. Graph $y = L(x)$. A)



B)



Answer: B

109) A video rental company charges \$5 for the first day, and \$4 for each additional day, for renting video tape. Use the greatest integer function and write an expression for renting a video tape for x days.

- A) $y = \lfloor 4x + 5 \rfloor$
- B) $y = 4 \lfloor x - 1 \rfloor + 5$
- C) $y = 4x + 5$
- D) $y + 5 = 4 \lfloor x \rfloor$

Answer: B

110) Suppose a car rental company charges \$134 for the first day and \$84 for each additional or partial day. Let $S(x)$ represent the cost of renting a car for x days. Find the value of $S(4.5)$.

- A) \$378
- B) \$512
- C) \$428
- D) \$470

Answer: D



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