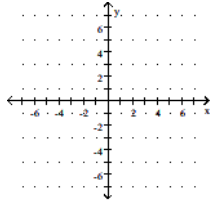


Name _____

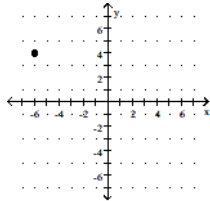
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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

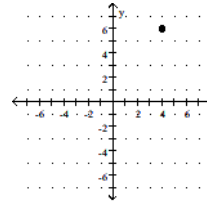
1) (6, 4)



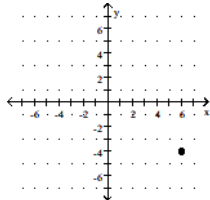
A) Quadrant II



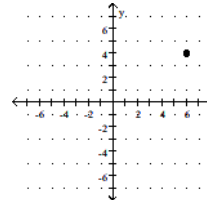
B) Quadrant I



C) Quadrant IV

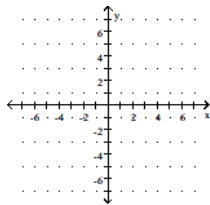


D) Quadrant I

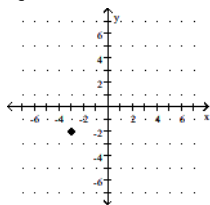


Answer: D

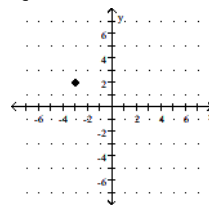
2) $(-3, 2)$



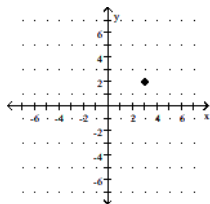
A) Quadrant III



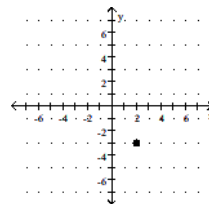
B) Quadrant II



C) Quadrant I

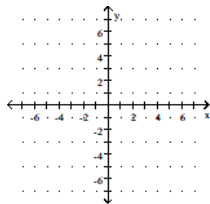


D) Quadrant IV

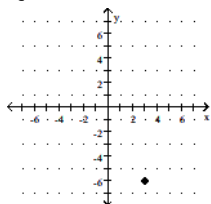


Answer: B

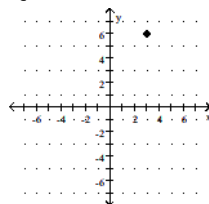
3) $(3, -6)$



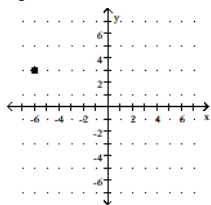
A) Quadrant IV



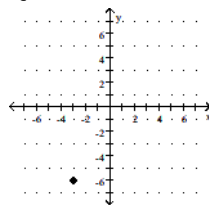
B) Quadrant I



C) Quadrant II

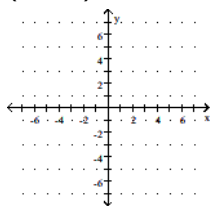


D) Quadrant III

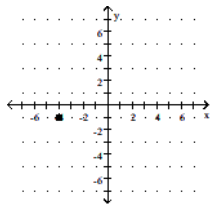


Answer: A

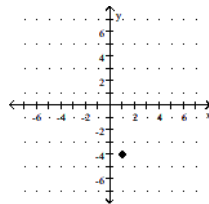
4) $(-1, -4)$



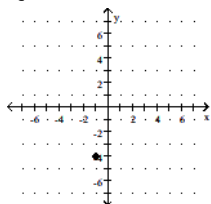
A) Quadrant III



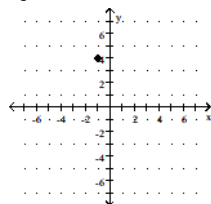
B) Quadrant IV



C) Quadrant III

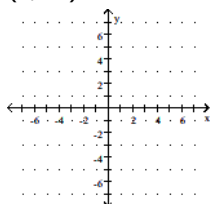


D) Quadrant II

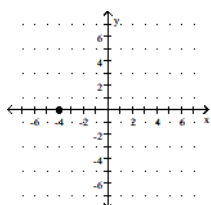


Answer: C

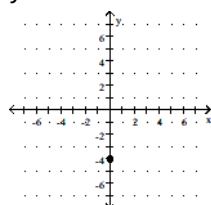
5) (0, -4)



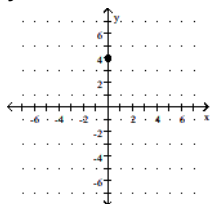
A) x-axis



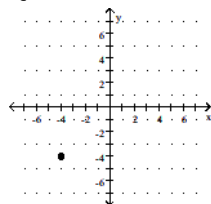
B) y-axis



C) y-axis

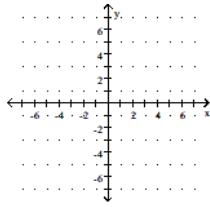


D) Quadrant I

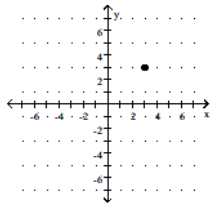


Answer: B

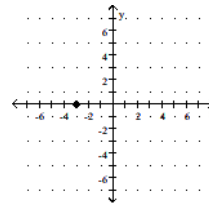
6) (3, 0)



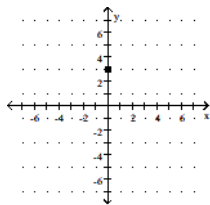
A) Quadrant I



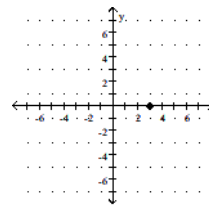
B) x-axis



C) y-axis



D) x-axis



Answer: D

Find the distance between P and Q.

7) P(4, -2), Q(1, 2)

A) 25

B) 6

C) 10

D) 5

Answer: D

8) P(6, 2), Q(-7, -3)

A) 65

B) $\sqrt{194}$

C) 8

D) 12

Answer: B

9) $P(3, -3), Q(7, -5)$

A) $12\sqrt{3}$

B) 6

C) 12

D) $2\sqrt{5}$

Answer: D

10) $P(-2, -7), Q(6, 7)$

A) $132\sqrt{33}$

B) 6

C) $2\sqrt{65}$

D) 132

Answer: C

11) $P(u - w, r), Q(u + w, r)$

A) $|u^2 - r^2|$

B) $2|u^2 - r^2|$

C) $|w|$

D) $2|w|$

Answer: D

12) $P(u, v), Q(v, u)$

A) $2|u + v|$

B) $2|u - v|$

C) $\sqrt{2}|u - v|$

D) $\sqrt{2}|u + v|$

Answer: C

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

13) $P(7, 2), Q(1, 4)$

A) $(3, 4)$

B) $(8, 6)$

C) $(6, -2)$

D) $(4, 3)$

Answer: D

14) $P(-7, -4), Q(-1, 5)$

A) $(-6, -9)$

B) $\left(-4, \frac{1}{2}\right)$

C) $(-8, 1)$

D) $\left(\frac{1}{2}, -4\right)$

Answer: B

15) $P(4b, 7), Q(5b, 8)$

A) $(b, 1)$

B) $\left(\frac{9b}{2}, \frac{15}{2}\right)$

C) $\left(\frac{15b}{2}, \frac{9}{2}\right)$

D) $(9b, 15)$

Answer: B

16) $P(y - z, p), Q(y + z, p)$

A) $(-z, 0)$

B) (p, y)

C) (y, p)

D) $(2y, 2p)$

Answer: C

17) $P(m, n), Q(n, m)$

A) $\left(\frac{m+n}{2}, \frac{m+n}{2}\right)$

B) $(m+n, m+n)$

C) (mn, mn)

D) $\left(\frac{mn}{2}, \frac{mn}{2}\right)$

Answer: A

Determine whether the given points are collinear.

18) $(5, -18), (3, -12), (-4, 9)$

A) Yes

B) No

Answer: A

19) $(1, -3), (-4, -8), (4, 8)$

A) Yes

B) No

Answer: B

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

20) $P(0, 0)$, $Q(6, -3)$, $R(3, -9)$

A) Isosceles

B) Scalene

C) Equilateral

Answer: A

21) $P(-3, -2)$, $Q(-1, -5)$, $R(-8, -5)$

A) Equilateral

B) Isosceles

C) Scalene

Answer: C

22) $P(10, -10)$, $Q(-10, 10)$, $R(-10\sqrt{3}, -10\sqrt{3})$

A) Isosceles

B) Scalene

C) Equilateral

Answer: C

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

23) $y = 5x - 4$; $(3, 11)$

A) Yes

B) No

Answer: A

24) $5y = -6x + 8$; $\left(0, \frac{3}{5}\right)$

A) Yes

B) No

Answer: B

25) $2x + 2y^2 = -6$; $(-4, 1)$

A) Yes

B) No

Answer: A

26) $y = \sqrt{x + 4}$; $(0, 2)$

A) Yes

B) No

Answer: A

27) $y = \frac{1}{x}$; $(10, 10)$

A) Yes

B) No

Answer: B

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

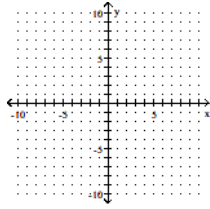
A) Yes

B) No

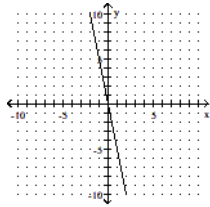
Answer: A

Graph the equation by plotting points.

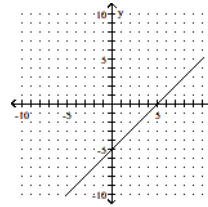
29) $y = x - 5$



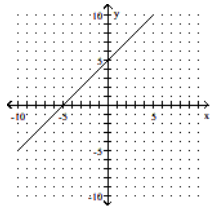
A)



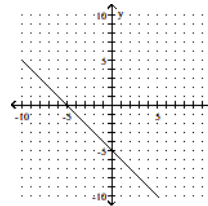
B)



C)

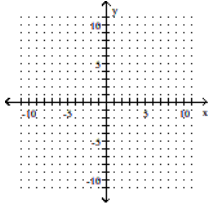


D)

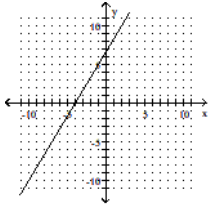


Answer: B

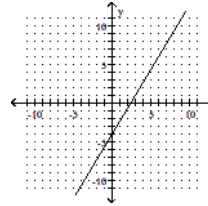
30) $y = \frac{3}{5}x - 4$



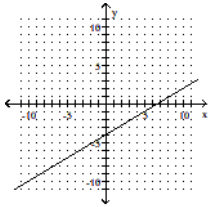
A)



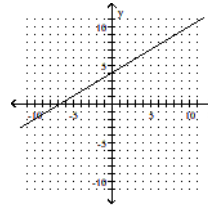
B)



C)

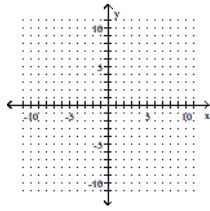


D)

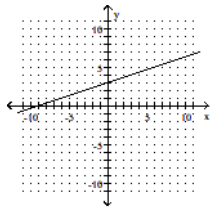


Answer: C

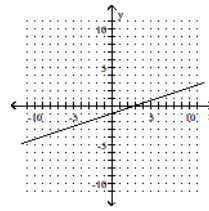
31) $y = 3x + 3$



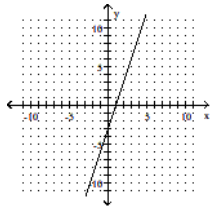
A)



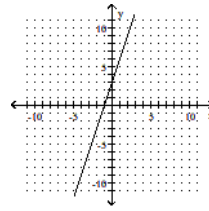
B)



C)

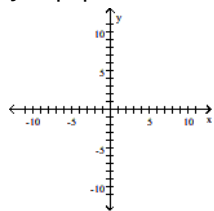


D)

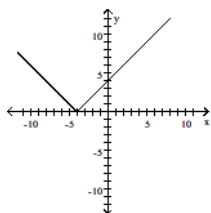


Answer: D

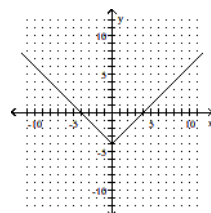
32) $y = |x| - 4$



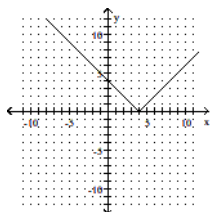
A)



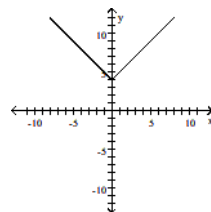
B)



C)

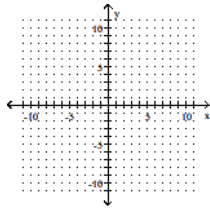


D)

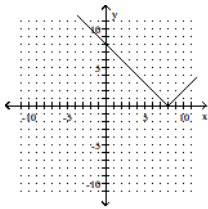


Answer: B

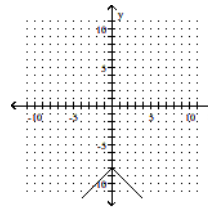
33) $y = |8 - x|$



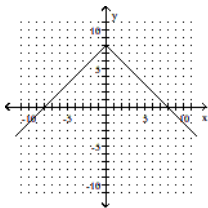
A)



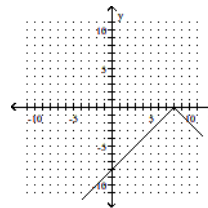
B)



C)

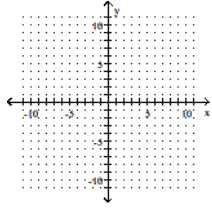


D)

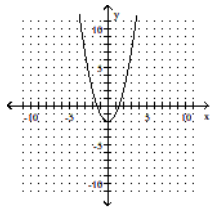


Answer: A

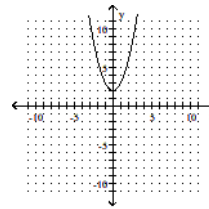
34) $y = x^2 + 2$



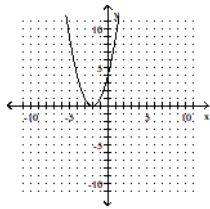
A)



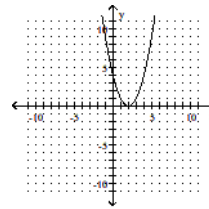
B)



C)

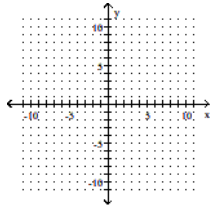


D)

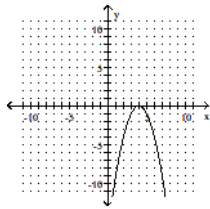


Answer: B

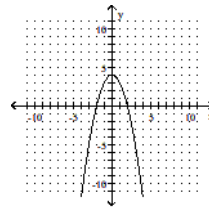
35) $y = -x^2 - 4$



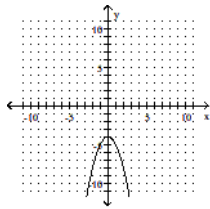
A)



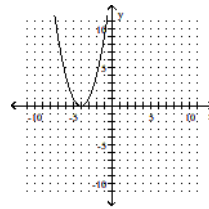
B)



C)

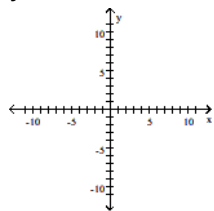


D)

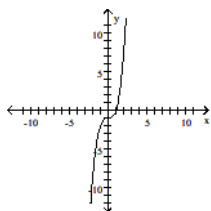


Answer: C

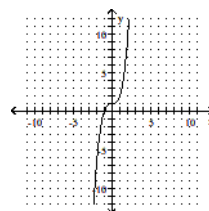
36) $y = x^3 + 1$



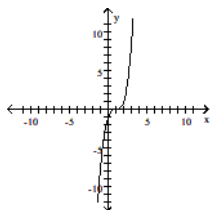
A)



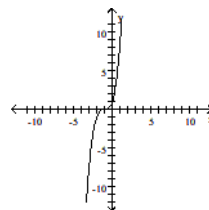
B)



C)

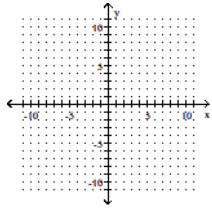


D)

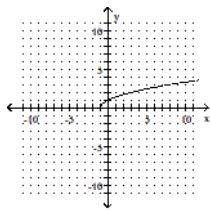


Answer: B

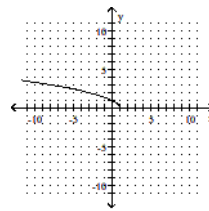
37) $y = \sqrt{x+1}$



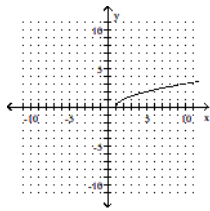
A)



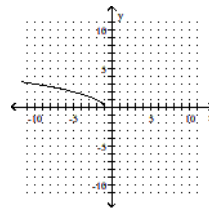
B)



C)



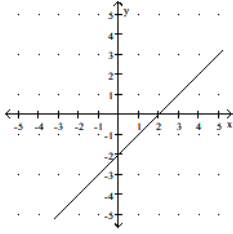
D)



Answer: A

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

38)



A) x-intercept: 2; y-intercept: 2

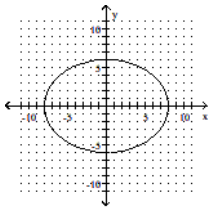
C) x-intercept: -2; y-intercept: -2

B) x-intercept: 2; y-intercept: -2

D) x-intercept: -2; y-intercept: 2

Answer: B

39)



A) x-intercepts: 6, -6; y-intercepts: 8, -8

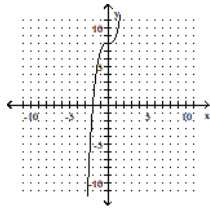
C) x-intercepts: 8, -8; y-intercepts: 6, -6

B) y-intercepts: 6, -6

D) x-intercepts: 8, -8

Answer: C

40)

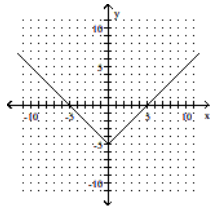


- A) x-intercept: -2; y-intercept: 8
C) x-intercept: -2; y-intercept: -8

- B) x-intercept: 2; y-intercept: -8
D) x-intercept: 2; y-intercept: 8

Answer: A

41)



- A) y-intercept: -5
C) x-intercepts: 5, -5; y-intercept: -5

- B) x-intercepts: 5, -5
D) x-intercepts: 5, -5; y-intercept: 0

Answer: C

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

42) $20y - 4x = -8$

- A) x-intercept: -2; y-intercept: $-\frac{2}{5}$
C) x-intercept: $-\frac{2}{5}$; y-intercept: 2

- B) x-intercept: $-\frac{2}{5}$; y-intercept: -2
D) x-intercept: 2; y-intercept: $-\frac{2}{5}$

Answer: D

43) $5x - 30y = 30$

- A) x-intercept: -6; y-intercept: 1
C) x-intercept: 6; y-intercept: -1

- B) x-intercept: 1; y-intercept: -6
D) x-intercept: -1; y-intercept: 6

Answer: C

44) $9x^2 + y^2 = 9$

- A) x-intercepts: -1, 1; y-intercepts: -3, 3
C) x-intercepts: -1, 1; y-intercepts: -9, 9

- B) x-intercepts: -9, 9; y-intercepts: -1, 1
D) x-intercepts: -3, 3; y-intercepts: -1, 1

Answer: A

45) $y = x^2 + 12x + 35$

- A) x-intercept: 35; y-intercepts: 7, 5
C) x-intercepts: -7, -5; y-intercept: 35

Answer: C

- B) x-intercept: 35; y-intercepts: -7, -5
D) x-intercepts: 7, 5; y-intercept: 35

46) $\frac{x}{5} + \frac{y}{2} = 3$

- A) x-intercept: 6; y-intercept: 15
C) x-intercept: 2; y-intercept: 5

Answer: D

- B) x-intercept: 8; y-intercept: 5
D) x-intercept: 15; y-intercept: 6

47) $x = y^2 + 9y + 14$

- A) x-intercepts: -7, -2; y-intercept: 14
C) x-intercept: -14; y-intercepts: 7, 2

Answer: D

- B) x-intercepts: 7, 2; y-intercept: -14
D) x-intercept: 14; y-intercepts: -7, -2

48) $y = \sqrt{1 - x^2}$

- A) x-intercept: 1; y-intercept: 1
C) x-intercept: 1; y-intercepts: -1, 1

Answer: D

- B) x-intercept: 1; y-intercept: -1
D) x-intercepts: -1, 1; y-intercept: 1

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

49) $y = 3x^2 + 2$

- A) x-axis only
C) origin only

Answer: B

- B) y-axis only
D) x-axis, y-axis, origin

50) $2x = 5y^2 + 5$

- A) x-axis, y-axis, origin
C) x-axis only

Answer: C

- B) y-axis only
D) origin only

51) $y = -2x^3 + 9x$

- A) x-axis, origin

Answer: C

- B) x-axis, y-axis

- C) origin only

- D) x-axis only

52) $y = 4x^5 - 4x^3$

- A) y-axis only
C) x-axis, y-axis, origin

Answer: B

- B) origin only
D) no symmetry

53) $y = -8x^4 + 2x + 3$

- A) origin only

Answer: B

- B) no symmetry

- C) x-axis only

- D) x-axis, origin

Specify the center and radius of the circle.

54) $(x + 4)^2 + (y + 8)^2 = 121$

A) center: (4, 8); radius: 11

C) center: (-8, -4); radius: 121

B) center: (-4, -8); radius: 11

D) center: (8, 4); radius: 121

Answer: B

55) $(x - 3)^2 + (y + 9)^2 = 25$

A) center: (9, -3); radius: 25

C) center: (-9, 3); radius: 5

B) center: (3, -9); radius: 5

D) center: (-3, 9); radius: 25

Answer: B

56) $(x + 3)^2 + (y - 3)^2 = 2$

A) center: (-3, 3); radius: 2

C) center: (3, -3); radius: 2

B) center: (3, -3); radius: $\sqrt{2}$

D) center: (-3, 3); radius: $\sqrt{2}$

Answer: D

57) $x^2 + y^2 - 18x + 4y + 76 = 0$

A) center: (2, -9); radius: 9

C) center: (-9, 2); radius: 9

B) center: (9, -2); radius: 3

D) center: (-2, 9); radius: 3

Answer: B

58) $x^2 - 12x + y^2 + 12y + 56 = 0$

A) center: (-6, 6); radius: 4

C) center: (6, -6); radius: 4

B) center: (-6, 6); radius: 16

D) center: (6, -6); radius: 16

Answer: C

59) $4x^2 + 4y^2 + 32x + 16y - 20 = 0$

A) center: (-2, -4); radius: 5

C) center: (4, 2); radius: 25

B) center: (-4, -2); radius: 5

D) center: (2, 4); radius: 25

Answer: B

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

60) Center at (-10, 0); radius 8

A) $(x + 10)^2 + y^2 = 64$

B) $(x - 10)^2 + y^2 = 64$

C) $x^2 + (y - 10)^2 = 8$

D) $x^2 + (y + 10)^2 = 8$

Answer: A

61) Center at (0, -10); radius 12

A) $x^2 + (y - 10)^2 = 12$

C) $(x + 10)^2 + y^2 = 144$

B) $(x - 10)^2 + y^2 = 144$

D) $x^2 + (y + 10)^2 = 144$

Answer: D

62) Center at (3, 6); radius $\sqrt{19}$

A) $(x + 3)^2 + (y + 6)^2 = 19$

C) $(x - 3)^2 + (y - 6)^2 = 19$

B) $(x + 6)^2 + (y + 3)^2 = 361$

D) $(x - 6)^2 + (y - 3)^2 = 361$

Answer: C

63) Center (6, -3); passing through the point (9, 1)

A) $(x + 6)^2 + (y - 3)^2 = 25$

C) $(x - 3)^2 + (y + 6)^2 = 9$

B) $(x - 6)^2 + (y + 3)^2 = 25$

D) $(x + 3)^2 + (y - 6)^2 = 9$

Answer: B

64) Center (4, 19); containing the origin

A) $(x - 4)^2 + (y - 19)^2 = 377$

C) $(x - 4)^2 + (y - 19)^2 = 19$

B) $(x - 19)^2 + (y - 4)^2 = 377$

D) $(x - 19)^2 + (y - 4)^2 = 19$

Answer: A

65) Center (18, 24); touching the x-axis

A) $(x - 18)^2 + (y - 24)^2 = 576$

C) $(x - 24)^2 + (y - 18)^2 = 324$

B) $(x - 18)^2 + (y - 24)^2 = 324$

D) $(x - 24)^2 + (y - 18)^2 = 24$

Answer: A

66) Center (9, 13); touching the y-axis

A) $(x - 9)^2 + (y - 13)^2 = 9$

C) $(x - 13)^2 + (y - 9)^2 = 81$

B) $(x - 9)^2 + (y - 13)^2 = 81$

D) $(x - 13)^2 + (y - 9)^2 = 9$

Answer: B

67) Diameter with endpoints (4, 3) and (4, -3)

A) $(x - 4)^2 + y^2 = 9$

B) $(x - 4)^2 + y^2 = 3$

C) $(x - 3)^2 + y^2 = 16$

D) $x^2 + (y - 3)^2 = 16$

Answer: A

68) Diameter with endpoints (-1, 3) and (7, -7)

A) $(x + 2)^2 + (y - 3)^2 = 41$

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

B) $x^2 + (y + 2)^2 = 16$

D) $(x - 3)^2 + (y + 2)^2 = 41$

Answer: D

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

69) $x^2 + y^2 + 4x - 2y - 2 = 0$

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

b. $(-2 + \sqrt{6}, 0), (0, 1 + \sqrt{3})$

B) a. center = $(-2, -1)$; radius = $\sqrt{7}$

b. $(-2 + 2\sqrt{2}, 0), (-2 - 2\sqrt{2}, 0), (0, 1 + \sqrt{3}), (0, 1 - \sqrt{3})$

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

b. $(-2 + \sqrt{6}, 0), (-2 - \sqrt{6}, 0), (0, 1 + \sqrt{3}), (0, 1 - \sqrt{3})$

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

b. $(-2 + \sqrt{6}, 0), (-2 - \sqrt{6}, 0), (0, 1 + \sqrt{3}), (0, 1 - \sqrt{3})$

Answer: C

70) $x^2 + y^2 - 4x + 4y - 1 = 0$

- A) a. center = (2, -2); radius = 3
 b. $(2 + \sqrt{5}, 0)$, $(2 - \sqrt{5}, 0)$, $(0, -2 + \sqrt{5})$, $(0, -2 - \sqrt{5})$
 B) a. center = (2, -2); radius = 3
 b. $(-2 + \sqrt{5}, 0)$, $(-2 - \sqrt{5}, 0)$, $(0, 2 + \sqrt{5})$, $(0, 2 - \sqrt{5})$
 C) a. center = (-2, 2); radius = 9
 b. $(2 + \sqrt{5}, 0)$, $(0, -2 + \sqrt{5})$
 D) a. center = (-2, -2); radius = 3
 b. $(2 + \sqrt{5}, 0)$, $(0, -2 + \sqrt{5})$

Answer: A

71) $x^2 + y^2 - 2y - 15 = 0$

- A) a. center = (1, 0); radius = 16
 b. $(\sqrt{15}, 0)$, $(-\sqrt{15}, 0)$, $(0, 5)$, $(0, -3)$
 C) a. center = (0, 1); radius = 4
 b. $(\sqrt{15}, 0)$, $(-\sqrt{15}, 0)$, $(0, 5)$, $(0, -3)$

Answer: C

- B) a. center = (0, -1); radius = 16
 b. $(\sqrt{15}, 0)$, $(0, 5)$, $(0, -3)$
 D) a. center = (0, 1); radius = 4
 b. $(\sqrt{15}, 0)$, $(0, 5)$

72) $4x^2 - 24x + 4y^2 - 28 = 0$

- A) a. center = (-3, 0); radius = 4
 b. $(7, 0)$, $(-1, 0)$, $(0, 2\sqrt{7})$, $(0, -2\sqrt{7})$
 C) a. center = (3, 0); radius = 16
 b. $(7, 0)$, $(-1, 0)$, $(0, 2\sqrt{7})$, $(0, -2\sqrt{7})$

Answer: D

- B) a. center = (-3, 0); radius = 16
 b. $(7, 0)$, $(0, 2\sqrt{7})$
 D) a. center = (3, 0); radius = 4
 b. $(7, 0)$, $(-1, 0)$, $(0, 2\sqrt{7})$, $(0, -2\sqrt{7})$

73) $5x^2 + 5y^2 - 4y = 0$

- A) a. center = $\left(0, \frac{2}{5}\right)$; radius = $\frac{2}{5}$
 b. $(0, 0)$, $\left(0, \frac{4}{5}\right)$
 C) a. center = $\left(0, \frac{2}{5}\right)$; radius = $\frac{4}{25}$
 b. $\left(0, \frac{4}{5}\right)$

Answer: A

- B) a. center = $\left(0, -\frac{2}{5}\right)$; radius = $\frac{2}{5}$
 b. $(0, 0)$, $\left(0, \frac{4}{5}\right)$
 D) a. center = $\left(0, \frac{2}{5}\right)$; radius = $\frac{2}{5}$
 b. $(0, 0)$

74) $x^2 + y^2 + 5 = 0$

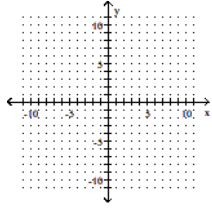
- A) a. center = (0, 0); radius = $\sqrt{5}$
 b. $(-\sqrt{5}, 0)$, $(\sqrt{5}, 0)$, $(0, \sqrt{5})$, $(0, -\sqrt{5})$
 C) a. center = (0, 0); radius = 5
 b. $(-\sqrt{5}, 0)$, $(\sqrt{5}, 0)$, $(0, \sqrt{5})$, $(0, -\sqrt{5})$

Answer: D

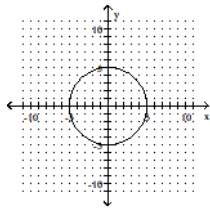
- B) a. center = (0, 0); radius = $\sqrt{5}$
 b. $(\sqrt{5}, 0)$, $(0, \sqrt{5})$
 D) a. $\emptyset$
 b. $\emptyset$

Graph the circle.

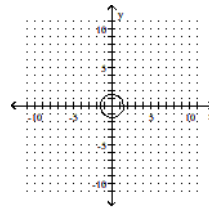
75) $x^2 + y^2 = 25$



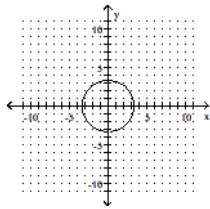
A)



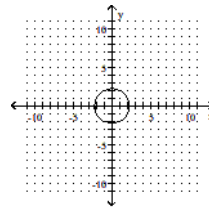
B)



C)

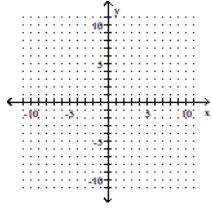


D)

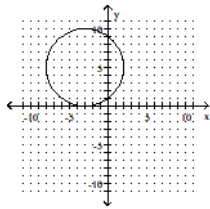


Answer: A

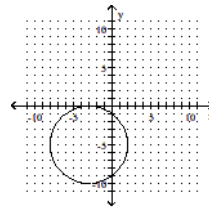
76) $(x - 3)^2 + (y - 5)^2 = 25$



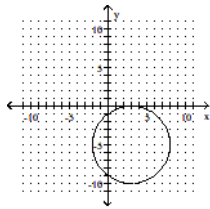
A)



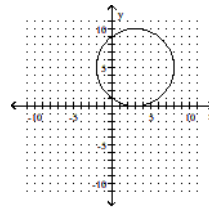
B)



C)

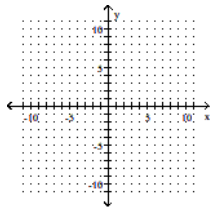


D)

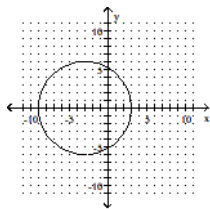


Answer: D

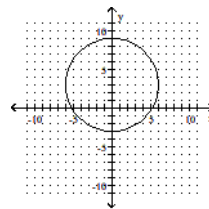
$$77) x^2 + (y - 3)^2 = 36$$



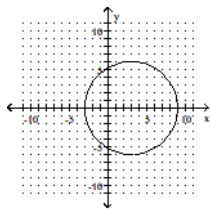
A)



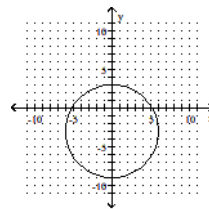
B)



C)

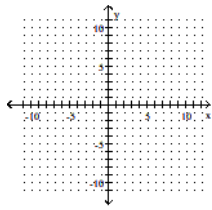


D)

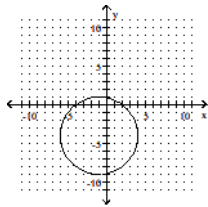


Answer: B

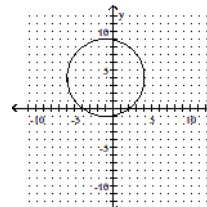
78) $(x - 1)^2 + (y + 4)^2 = 25$



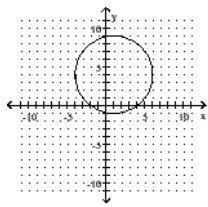
A)



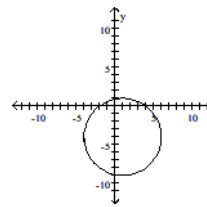
B)



C)

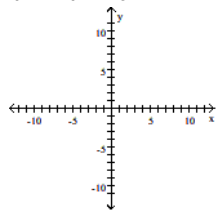


D)

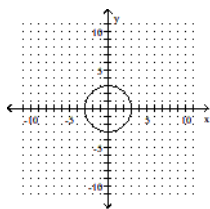


Answer: D

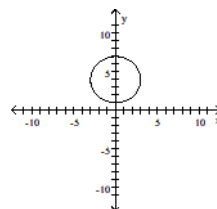
79) $(x - 4)^2 + y^2 = 9$



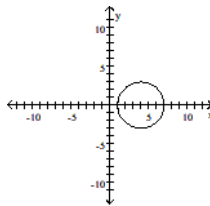
A)



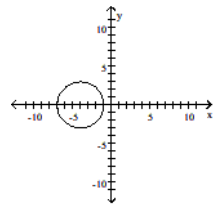
B)



C)

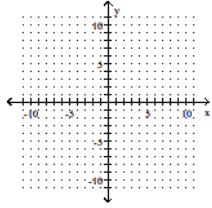


D)

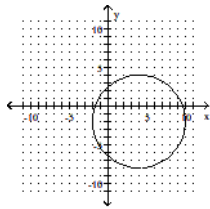


Answer: C

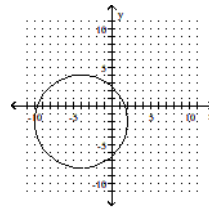
80) $x^2 + y^2 - 8x - 4y - 16 = 0$



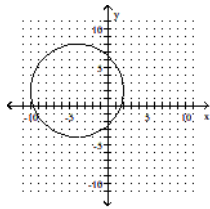
A)



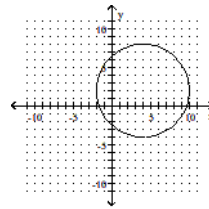
B)



C)

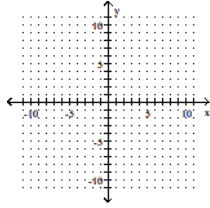


D)

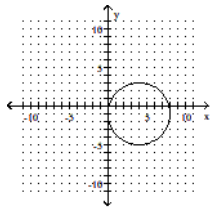


Answer: D

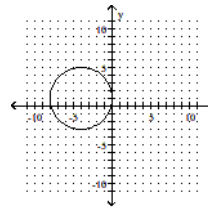
81) $x^2 + y^2 + 8x + 2y + 1 = 0$



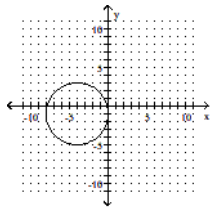
A)



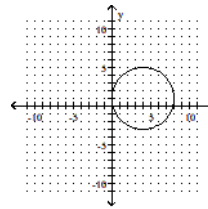
B)



C)



D)



Answer: C

Solve for the requested variable.

82) The equation $E = 0.0034x^3 - 0.0057x^2 + 0.182x + 1.87$ gives the approximate total earnings of a company, in millions of dollars, where $x = 0$ corresponds to 1996. Determine the earnings for 2000.

A) \$2.46 million

B) \$2.72 million

C) \$3.06 million

D) \$2.91 million

Answer: B

83) Your company uses the quadratic model $y = -11x^2 + 350x$ to represent how many units (y) of a new product will be sold (x) weeks after its release. How many units can you expect to sell in week 21?

A) 7119 units

B) 12,201 units

C) 7581 units

D) 2499 units

Answer: D

- 84) Your company uses the quadratic model $y = -4.5x^2 + 150x$ to represent the average number of new customers who will be signed on (x) weeks after the release of your new service. How many new customers can you expect to gain in week 14?

A) 609 customers

B) 168 customers

C) 1218 customers

D) 2037 customers

Answer: C

Provide an appropriate response.

- 85) Determine the quadrants in which the given point (x, y) may lie when $xy > 0$.

A) II or III

B) I or II

C) I or III

D) II or IV

Answer: C

- 86) Determine the quadrants in which the given point (x, y) may lie when $x < 0$.

A) II or III

B) I or IV

C) III or IV

D) II or IV

Answer: A

- 87) Find all the points having an x -coordinate of 9 whose distance from the point $(3, -2)$ is 10.

A) $(9, -12), (9, 8)$

B) $(9, 13), (9, -7)$

C) $(9, 6), (9, -10)$

D) $(9, 2), (9, -4)$

Answer: C

- 88) The points $(-1, 4), (2, 7), (4, -1)$, and $(7, 2)$ are the vertices of a quadrilateral. Is the quadrilateral a rectangle?

A) Yes

B) No

Answer: A

- 89) The points $(3, 9), (6, 8), (8, 0)$, and $(11, 3)$ are the vertices of a quadrilateral. Is the quadrilateral a rectangle?

A) Yes

B) No

Answer: B

- 90) Graph the rectangle with vertices $(3, 5), (6, 8), (8, 0)$, and $(11, 3)$. Are the midpoints of the sides of the rectangle the vertices of a rectangle?

A) Yes

B) No

Answer: A

- 91) Graph the rectangle with vertices $(3, 7), (6, 10), (8, 2)$, and $(11, 5)$. Are the midpoints of the sides the vertices of a square?

A) Yes

B) No

Answer: B

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

- 92) $(3, 1)$ and $(6, 8)$

A) $-\frac{7}{3}$

B) $\frac{3}{7}$

C) $\frac{7}{3}$

D) 1

Answer: C

- 93) $(-9, 8)$ and $(4, 7)$

A) $\frac{1}{13}$

B) -3

C) -13

D) $-\frac{1}{13}$

Answer: D

94) (6, 19) and (-15, 9)

A) $-\frac{28}{9}$

B) $\frac{21}{10}$

C) $-\frac{10}{21}$

D) $\frac{10}{21}$

Answer: D

95) (-1, 1) and (-1, -8)

A) $-\frac{9}{2}$

B) 0

C) $\frac{7}{2}$

D) undefined

Answer: D

96) (-4, -5), (-8, -5)

A) 4

B) -4

C) 0

D) undefined

Answer: C

97) $(\sqrt{2}, -4)$ and $(0.42, -4)$

A) $\sqrt{2} - 0.42$

B) 0

C) $0.42 - \sqrt{2}$

D) undefined

Answer: B

98) (-3.8, 14.8), (-15.8, 16.4)

A) $\frac{2}{15}$

B) $\frac{15}{2}$

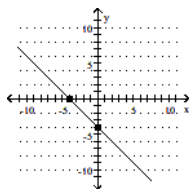
C) $-\frac{2}{15}$

D) $-\frac{15}{2}$

Answer: C

Find the slope of the line.

99)



A) 4

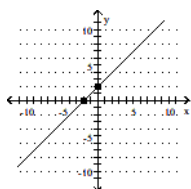
B) -1

C) -4

D) 1

Answer: B

100)



A) 2

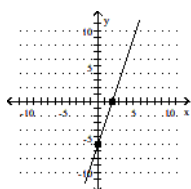
B) -1

C) -2

D) 1

Answer: D

101)



A) 3

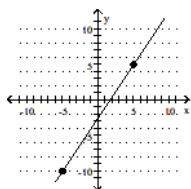
B) $-\frac{1}{3}$

C) $\frac{1}{3}$

D) -3

Answer: A

102)



A) $-\frac{3}{2}$

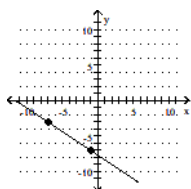
B) $-\frac{2}{3}$

C) $\frac{3}{2}$

D) $\frac{2}{3}$

Answer: C

103)



A) $\frac{2}{3}$

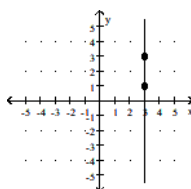
B) $-\frac{3}{2}$

C) $-\frac{2}{3}$

D) $\frac{3}{2}$

Answer: C

104)



A) 2

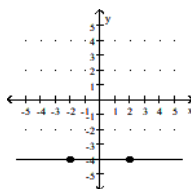
B) -2

C) 0

D) undefined

Answer: D

105)



A) -4

B) 0

C) 4

D) undefined

Answer: B

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

106) $(0, 2)$; $m = \frac{3}{2}$

A) $y = 2x - \frac{3}{2}$

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

C) $y = \frac{3}{2}x - 2$

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

Answer: B

107) $(0, 3)$; $m = -\frac{2}{9}$

A) $y = -\frac{2}{9}x - 3$

B) $y = 3x + \frac{2}{9}$

C) $y = 3x - \frac{2}{9}$

D) $y = -\frac{2}{9}x + 3$

Answer: D

108) $(0, 2)$; $m = \frac{5}{7}$

A) $y = 2x + \frac{5}{7}$

B) $y = \frac{5}{7}x + 2$

C) $y = \frac{5}{7}x - 2$

D) $y = 2x - \frac{5}{7}$

Answer: B

109) $(5, 0)$; $m = 10$

A) $y = -10x + 5$

B) $y = -5x + 10$

C) $y = 10x - 50$

D) $y = 5x + 10$

Answer: C

110) $(2, 2)$; $m = -\frac{7}{8}$

A) $y = -\frac{8}{7}x + \frac{15}{4}$

B) $y = -\frac{7}{8}x + \frac{4}{15}$

C) $y = -\frac{7}{8}x - \frac{15}{4}$

D) $y = -\frac{7}{8}x + \frac{15}{4}$

Answer: D

111) $(5, 5)$; $m = -\frac{3}{4}$

A) $y = -\frac{3}{4}x + \frac{4}{35}$

B) $y = -\frac{4}{3}x - \frac{4}{35}$

C) $y = -\frac{3}{4}x + \frac{35}{4}$

D) $y = -\frac{3}{4}x - \frac{35}{4}$

Answer: C

112) $(10, -3)$; $m = -\frac{3}{4}$

A) $y = -\frac{3}{4}x + \frac{21}{2}$

B) $y = -\frac{3}{4}x + \frac{27}{4}$

C) $y = \frac{3}{4}x - \frac{9}{2}$

D) $y = -\frac{3}{4}x + \frac{9}{2}$

Answer: D

113) $(4, -2)$; $m = 0$

A) $y = \frac{1}{2}x + 0$

B) $x = 4$

C) $y = 2x + 0$

D) $y = -2$

Answer: D

114) (3, 6); m is undefined

A) $y = 3$

B) $x = 6$

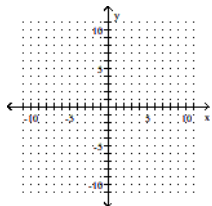
C) $y = 6$

D) $x = 3$

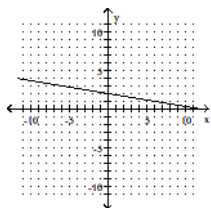
Answer: D

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

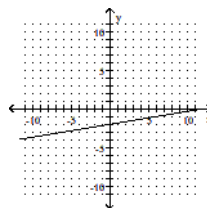
115) Through (0, 2), $m = \frac{1}{6}$



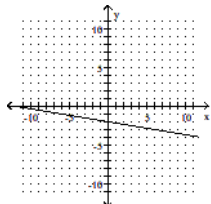
A)



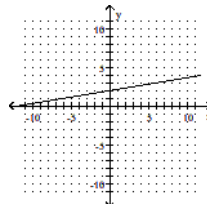
B)



C)

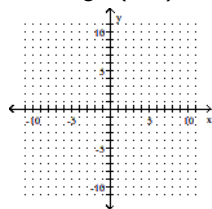


D)

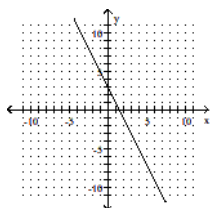


Answer: D

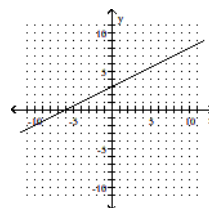
116) Through $(0, 3)$, $m = -2$



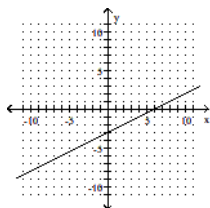
A)



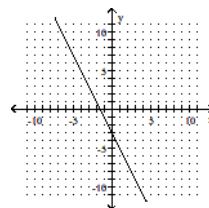
B)



C)

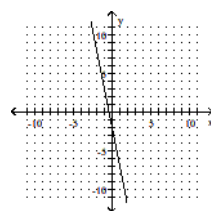
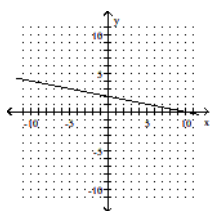
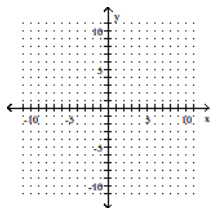


D)

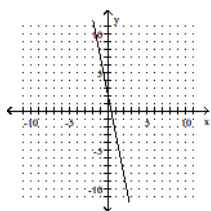


Answer: A

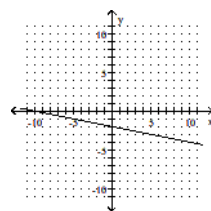
117) Through $(10, 0)$, $m = -\frac{1}{5}$



A)



B)

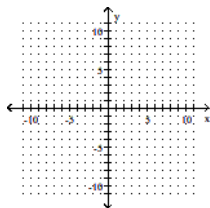


C)

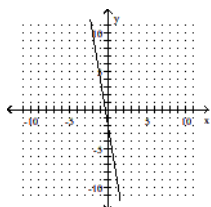
Answer: A

D)

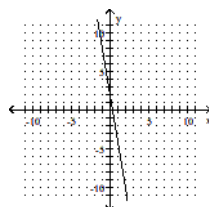
118) Through $(0, 2)$, $m = -\frac{1}{6}$



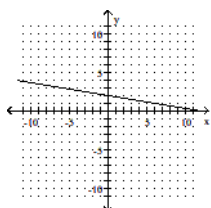
A)



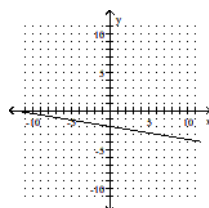
B)



C)

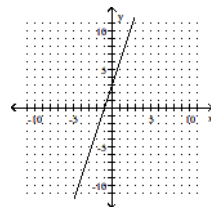
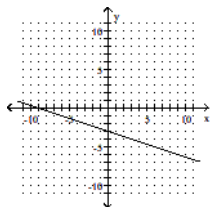
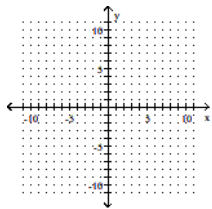


D)

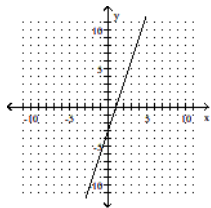


Answer: C

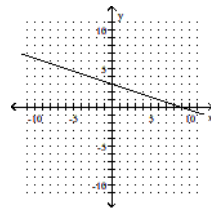
119) Through $(-4, -9)$, $m = 3$



A)



B)

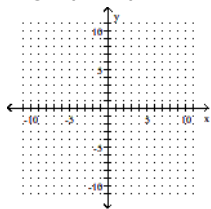


C)

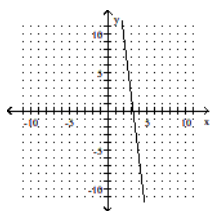
Answer: B

D)

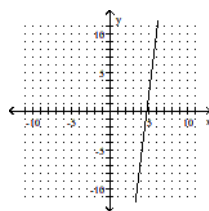
120) Through $(4, -6)$, $m = -8$



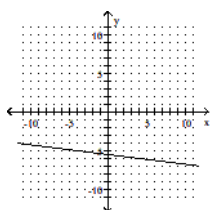
A)



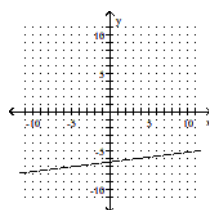
B)



C)

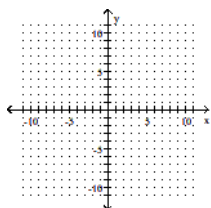


D)

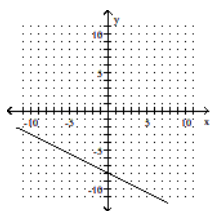


Answer: A

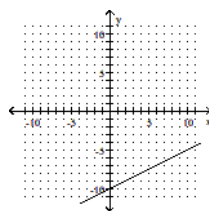
121) Through $(-2, -9)$, $m = \frac{1}{2}$



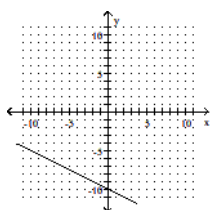
A)



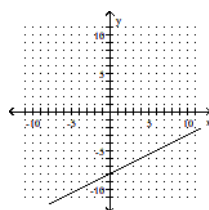
B)



C)

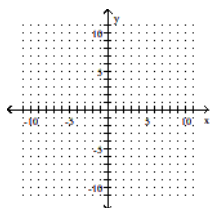


D)

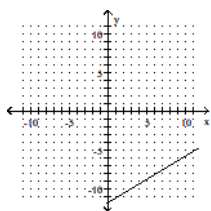


Answer: D

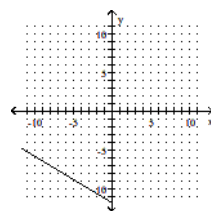
122) Through $(-3, -10)$, $m = -\frac{3}{5}$



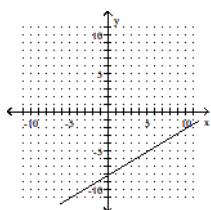
A)



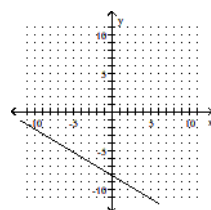
B)



C)

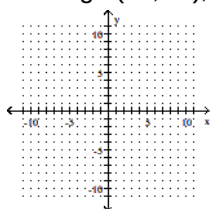


D)

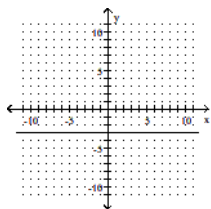


Answer: B

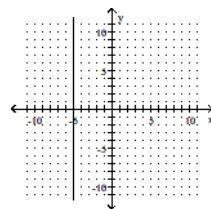
123) Through $(-2, -3)$, $m = 0$



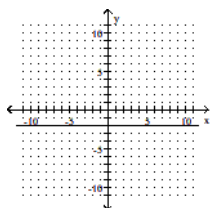
A)



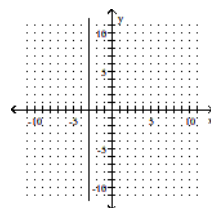
B)



C)

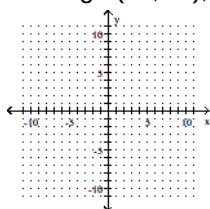


D)

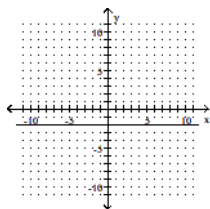


Answer: A

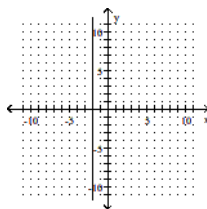
124) Through $(-4, -2)$, m is undefined.



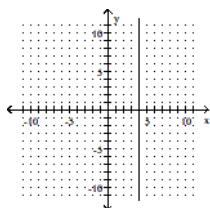
A)



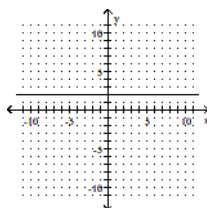
B)



C)



D)



Answer: B

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

125) Passing through (5, 2) and (0, -6)

A) $y = -\frac{1}{2}x - 6$

B) $y = \frac{8}{5}x - 6$

C) $y = -\frac{8}{5}x - 6$

D) $y = \frac{1}{2}x - 6$

Answer: B

126) Passing through (2, 0) and (-2, -7)

A) $y = \frac{7}{4}x - \frac{7}{2}$

B) $y = \frac{2}{5}x - \frac{31}{5}$

C) $y = -\frac{2}{5}x - \frac{31}{5}$

D) $y = -\frac{7}{4}x - \frac{7}{2}$

Answer: A

127) Passing through (0, -8) and (-5, 3)

A) $y = \frac{11}{5}x - 8$

B) $y = -\frac{11}{5}x - 8$

C) $y = -1x - 2$

D) $y = 1x - 2$

Answer: B

128) Passing through (-1, -4) and (-7, -9)

A) $y = \frac{5}{6}x - \frac{19}{6}$

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

C) $y = -\frac{5}{6}x - \frac{19}{6}$

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

Answer: A

129) Passing through (7, 3) and (-1, 3)

A) $y = 6x - 45$

B) $y = 2x - 17$

C) $y = 3$

D) $y = 3x - 24$

Answer: C

130) Passing through (-7, 3) and (-7, 9)

A) $x = 3$

B) $x = -7$

C) $y = -7$

D) $y = 3$

Answer: B

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

131) A vertical line through (-6.23, 0.67)

A) $y = 0.67$

B) $y = -6.23$

C) $x = -6.23$

D) $x = 0.67$

Answer: C

132) A horizontal line through (5.83, 9.09)

A) $y = 9.09$

B) $x = 5.83$

C) $y = 5.83$

D) $x = 9.09$

Answer: A

133) $m = \frac{7}{5}$; y-intercept = -3

A) $y = \frac{7}{5}x - 3$

B) $y = \frac{7}{5}x + 3$

C) $y = -\frac{7}{5}x - 3$

D) $y = -\frac{7}{5}x + 3$

Answer: A

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

A) $y = \frac{2}{5}x - 2$

B) $y = -\frac{2}{5}x + 2$

C) $y = -\frac{2}{5}x - 2$

D) $y = \frac{2}{5}x + 2$

Answer: B

135) y-intercept -27; x-intercept 10

A) $y = \frac{27}{10}x + 27$

B) $y = -\frac{27}{10}x - 27$

C) $y = \frac{10}{27}x - 27$

D) $y = \frac{27}{10}x - 27$

Answer: D

136) Perpendicular to $x = 1$; passing through (-5, -3)

A) $x = -5$

B) $-3x - 5y = 0$

C) $-5x - 3y = 0$

D) $y = -3$

Answer: D

137) Parallel to $x = 7$; passing through (9, 6)

A) $x = 9$

B) $y = 7$

C) $y = 6$

D) $x = 6$

Answer: A

138) Parallel to $y = 0$; passing through (-6, -9)

A) $x = 9$

B) $y = -9$

C) $x = -6$

D) $y = 6$

Answer: B

139) Parallel to $8x - 3y = 17$; passing through $(1, -2)$

A) $y = \frac{3}{8}x - \frac{1}{4}$

B) $y = \frac{1}{3}x - \frac{17}{3}$

C) $y = -\frac{8}{3}x + \frac{14}{3}$

D) $y = \frac{8}{3}x - \frac{14}{3}$

Answer: D

140) Perpendicular to $-2x + 5y = -31$; passing through $(-7, -9)$

A) $y = \frac{5}{2}x + \frac{53}{2}$

B) $y = -\frac{5}{2}x - \frac{53}{2}$

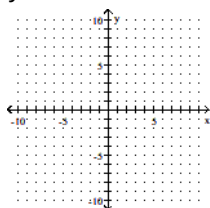
C) $y = -\frac{5}{2}x$

D) $y = -\frac{2}{5}x - 53$

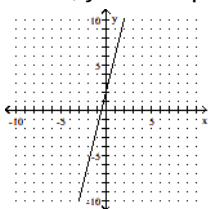
Answer: B

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

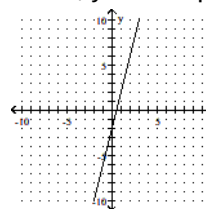
141) $y = 2x - 4$



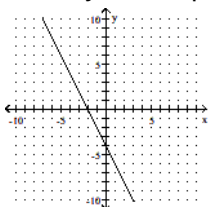
A) $m = 4$, y-intercept = 2



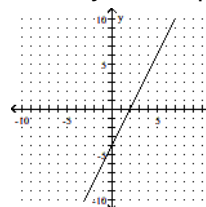
B) $m = 2$, y-intercept = 4



C) $m = 4$, y-intercept = 2

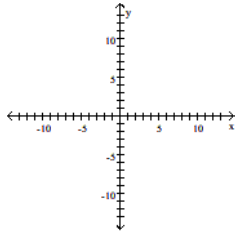


D) $m = 2$, y-intercept = -4

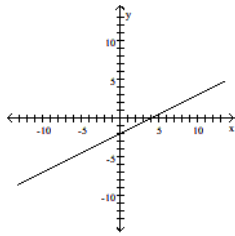


Answer: D

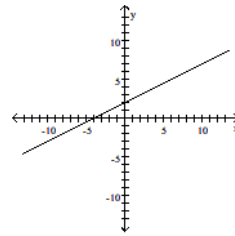
142) $y = -\frac{1}{2}x + 2$



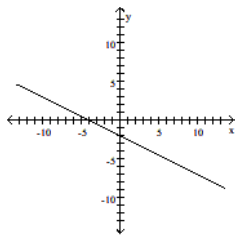
A) $m = \frac{1}{2}$; y-intercept = -2



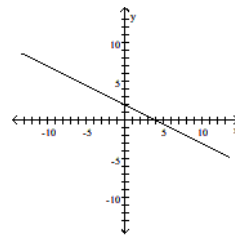
B) $m = \frac{1}{2}$; y-intercept = 2



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

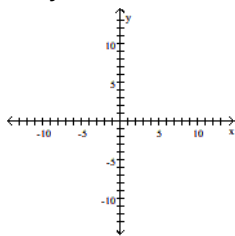


D) $m = -\frac{1}{2}$; y-intercept = 2

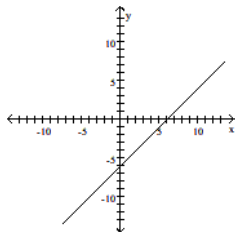


Answer: D

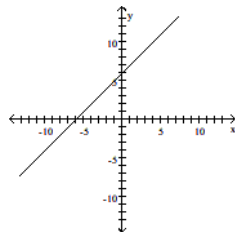
143) $x + y = 6$



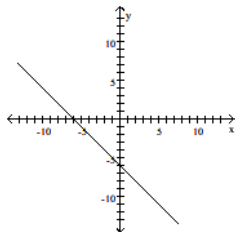
A) $m = 1$; y-intercept = -6



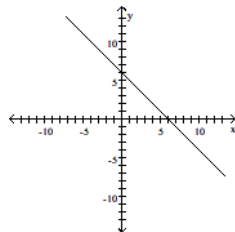
B) $m = 1$; y-intercept = 6



C) $m = -1$; y-intercept = -6

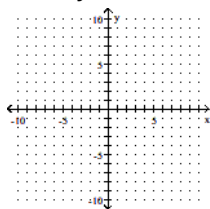


D) $m = -1$; y-intercept = 6

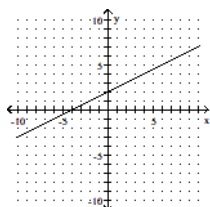


Answer: D

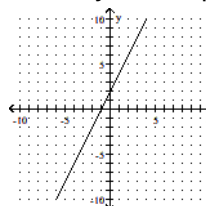
144) $2x + 4y = 16$



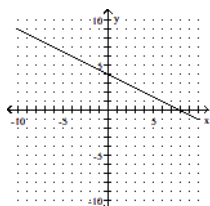
A) $m = \frac{1}{2}$; y-intercept = 2



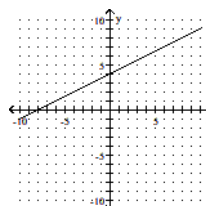
B) $m = 2$; y-intercept = 2



C) $m = -\frac{1}{2}$; y-intercept = 4

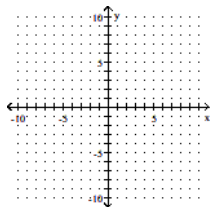


D) $m = \frac{1}{2}$; y-intercept = 4

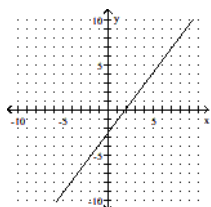


Answer: C

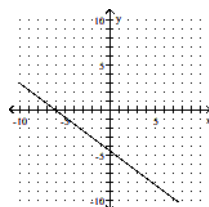
145) $3x - 4y = 18$



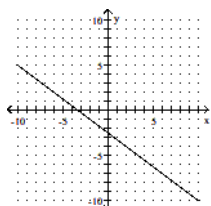
A) $m = \frac{4}{3}$; y-intercept = $-\frac{5}{2}$



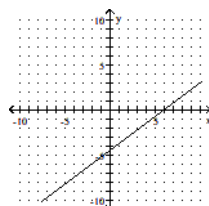
B) $m = -\frac{3}{4}$; y-intercept = $-\frac{9}{2}$



C) $m = -\frac{3}{4}$; y-intercept = $-\frac{5}{2}$

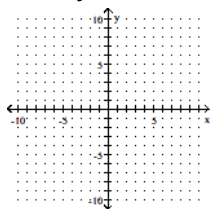


D) $m = \frac{3}{4}$; y-intercept = $-\frac{9}{2}$

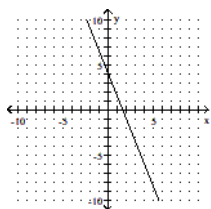


Answer: D

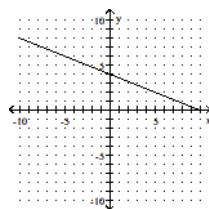
146) $2x - 5y = -30$



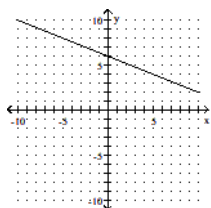
A) $m = -\frac{5}{2}$; y-intercept = 4



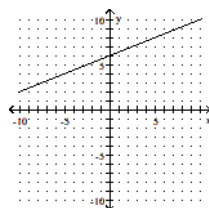
B) $m = -\frac{2}{5}$; y-intercept = 4



C) $m = -\frac{2}{5}$; y-intercept = 6

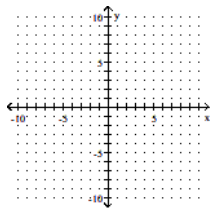


D) $m = \frac{2}{5}$; y-intercept = 6

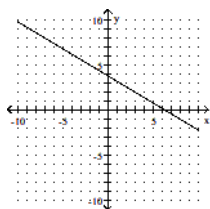


Answer: D

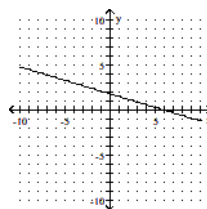
147) $-5y = -3x - 19$



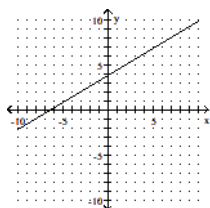
A) $m = -\frac{3}{5}$; y-intercept = $\frac{19}{5}$



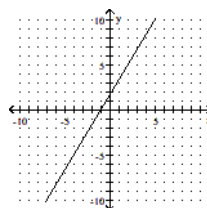
B) $m = -\frac{3}{5}$; y-intercept = $\frac{9}{5}$



C) $m = \frac{3}{5}$; y-intercept = $\frac{19}{5}$

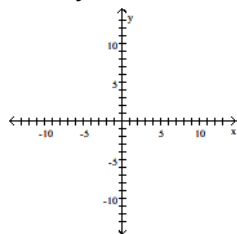


D) $m = \frac{5}{3}$; y-intercept = $\frac{9}{5}$

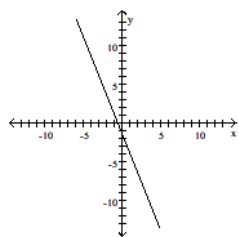


Answer: C

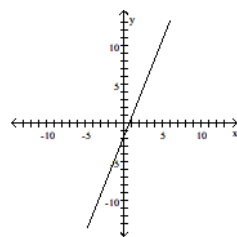
148) $5x - 2y + 3 = 0$



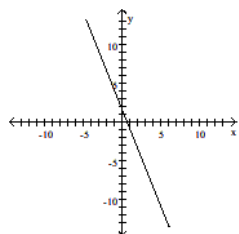
A) $m = -\frac{5}{2}$; y-intercept = $-\frac{3}{2}$



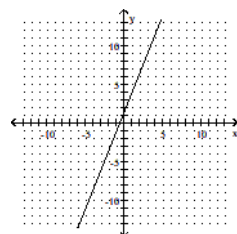
B) $m = \frac{5}{2}$; y-intercept = $-\frac{3}{2}$



C) $m = -\frac{5}{2}$; y-intercept = $\frac{3}{2}$

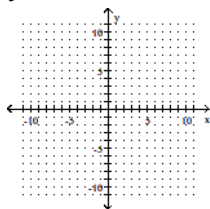


D) $m = \frac{5}{2}$; y-intercept = $\frac{3}{2}$

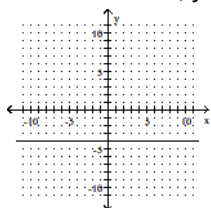


Answer: D

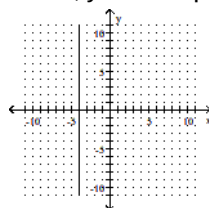
149) $y = -4$



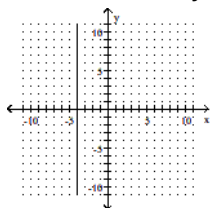
A) $m = \text{undefined}$; y -intercept = -4



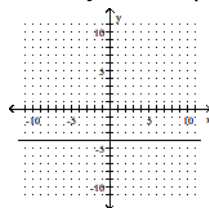
B) $m = 0$; y -intercept = none



C) $m = \text{undefined}$; y -intercept = none

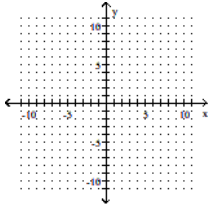


D) $m = 0$; y -intercept = -4

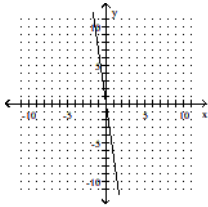


Answer: D

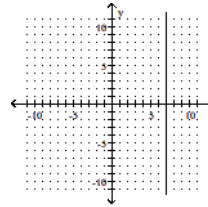
150) $x = -7$



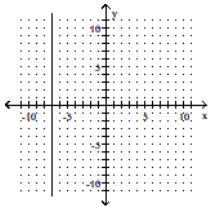
A) $m = -7$; y-intercept = 0



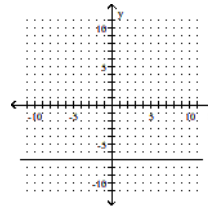
B) m = undefined; y-intercept = none



C) m = undefined; y-intercept = none



D) $m = 0$; y-intercept = -7



Answer: C

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

151) $3x - 2y = -14$

$2x + 3y = -14$

A) Parallel

B) Perpendicular

C) Neither

Answer: B

152) $3x - 2y = -19$

$2x + 3y = -19$

A) Parallel

B) Perpendicular

C) Neither

Answer: B

153) $12x + 4y = 16$

$6x + 2y = 10$

A) Parallel

B) Perpendicular

C) Neither

Answer: A

154) $6x + 2y = 8$

$9x + 3y = 15$

A) Parallel

B) Perpendicular

C) Neither

Answer: A

155) $3x - 8y = -20$

$48x + 12y = -20$

A) Parallel

B) Perpendicular

C) Neither

Answer: C

156) $y + 15 = -4x$

$2y = 12x - 19$

A) Parallel

B) Perpendicular

C) Neither

Answer: C

157) $y - 5 = -x$

$y - x = 5$

A) Parallel

B) Perpendicular

C) Neither

Answer: B

158) $y = 1 - 0.5x$

$y = -\frac{1}{2}x - 1$

A) Parallel

B) Perpendicular

C) Neither

Answer: A

159) $y = -\frac{11}{2}x + 1$

$y = \frac{2}{11}x + 1$

A) Parallel

B) Perpendicular

C) Neither

Answer: B

Solve the problem.

160) To convert a temperature from degrees Celsius to degrees Fahrenheit, you multiply the temperature in degrees Celsius by 1.8 and then add 32 to the result. Find a linear equation to convert from degrees Celsius to degrees Fahrenheit.

A) $F = 1.8c + 32$

B) $F = \frac{c - 32}{1.8}$

C) $F = 1.8 + 32c$

D) $F = 33.8c$

Answer: A

161) If an object is dropped off of a tower, the velocity, V , of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Find an equation relating the velocity, V , to the number of seconds, t .

A) $V = 32t + 10$

B) $V = 32 + 10t$

C) $V = \frac{t-10}{32}$

D) $V = 42t$

Answer: A

162) The cost for labor associated with fixing a washing machine is computed as follows: There is a fixed charge of \$25 for the repairman to come to the house, to which a charge of \$24 per hour is added. Find an equation that can be used to determine the labor cost, C , of a repair that takes x hours.

A) $C = 24 + 25x$

B) $C = 25 + 24x$

C) $C = (25 + 24)x$

D) $C = 25 - 24x$

Answer: B

163) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of \$2.80 as soon as you get in the taxi, to which a charge of \$2.35 per mile is added. Find an equation that can be used to determine the cost, C , of an x -mile taxi ride.

A) $C = 5.15x$

B) $C = 3.65x$

C) $C = 2.35 + 2.80x$

D) $C = 2.80 + 2.35x$

Answer: D

164) Marty's Tee Shirt & Jacket Company is to produce a new line of jackets with an embroidery of a Great Pyrenees dog on the front. There are fixed costs of \$560 to set up for production, and variable costs of \$34 per jacket. Write an equation that can be used to determine the total cost, C , encountered by Marty's Company in producing x jackets.

A) $C = 560x + 34$

B) $C = 560 + 34x$

C) $C = (560 + 34)x$

D) $C = 560 - 34x$

Answer: B

165) The average value of a certain type of automobile was \$13,020 in 1993 and depreciated to \$4020 in 1996. Let y be the average value of the automobile in the year x , where $x = 0$ represents 1993. Write a linear equation that models the value of the automobile in terms of the year x .

A) $y = -3000x - 4980$

B) $y = -3000x + 13,020$

C) $y = -\frac{1}{3000}x - 4020$

D) $y = -3000x + 4020$

Answer: B

166) An investment is worth \$3328 in 1995. By 2000 it has grown to \$4478. Let y be the value of the investment in the year x , where $x = 0$ represents 1995. Write a linear equation that models the value of the investment in the year x .

A) $y = -230x + 3328$

B) $y = 230x + 3328$

C) $y = \frac{1}{230}x + 3328$

D) $y = -230x + 5628$

Answer: B

167) A faucet is used to add water to a large bottle that already contained some water. After it has been filling for 5 seconds, the gauge on the bottle indicates that it contains 30 ounces of water. After it has been filling for 13 seconds, the gauge indicates the bottle contains 70 ounces of water. Let y be the amount of water in the bottle x seconds after the faucet was turned on. Write a linear equation that models the amount of water in the bottle in terms of x .

A) $y = 5x + 57$

B) $y = \frac{1}{5}x + 29$

C) $y = 5x + 5$

D) $y = -5x + 55$

Answer: C

168) When making a telephone call using a calling card, a call lasting 4 minutes cost \$2.10. A call lasting 11 minutes cost \$4.90. Let y be the cost of making a call lasting x minutes using a calling card. Write a linear equation that models the cost of a making a call lasting x minutes.

A) $y = 0.4x - 6.1$

B) $y = 0.4x + 0.5$

C) $y = -0.4x + 3.7$

D) $y = \frac{5}{2}x - \frac{79}{10}$

Answer: B

169) A vendor has learned that, by pricing pretzels at \$1.00, sales will reach 112 pretzels per day. Raising the price to \$2.00 will cause the sales to fall to 68 pretzels per day. Let y be the number of pretzels the vendor sells at x dollars each. Write a linear equation that models the number of pretzels sold per day when the price is x dollars each.

A) $y = -44x - 156$

B) $y = -\frac{1}{44}x + \frac{4927}{44}$

C) $y = -44x + 156$

D) $y = 44x + 68$

Answer: C

170) The cost of manufacturing a molded part is related to the quantity produced during a production run. When 100 parts are produced, the cost is \$300. When 300 parts are produced, the cost is \$1900. What is the average cost per part?

A) \$8.00 per part

B) \$5.33 per part

C) \$0.13 per part

D) \$9.00 per part

Answer: A

171) A cross-country skier reaches the 12-km mark of a race 40 min after reaching the 2-km mark. Find the speed of the skier.

A) 10 km/hr

B) 15 km/hr

C) 20 km/hr

D) 18 km/hr

Answer: B

172) To convert a temperature from degrees Celsius to degrees Fahrenheit, you multiply the temperature in degrees Celsius by 1.8 and then add 32 to the result. Find a linear equation to convert from degrees Celsius to degrees Fahrenheit. Use this function to convert 20°C to $^{\circ}\text{F}$.

A) 63.3°F

B) 68°F

C) 55.7°F

D) 59°F

Answer: B

173) If an object is dropped from a tower, then the velocity, V (in feet per second), of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Find an equation relating the velocity, V , to the number of seconds, t . Use this equation to find the velocity of the object at time $t = 8.1$ seconds.

A) 267.2 ft/sec

B) 269.2 ft/sec

C) 270.5 ft/sec

D) 268.5 ft/sec

Answer: B

174) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of \$2.10 as soon as you get in the taxi, to which a charge of \$2.05 per mile is added. Find an equation that can be used to determine the cost, C , of an x -mile taxi ride, and use this equation to find the cost of a 4-mile taxi ride.

A) \$11.20

B) \$10.48

C) \$10.18

D) \$10.30

Answer: D

175) Marty's Tee Shirt & Jacket Company is to produce a new line of jackets with a embroidery of a Great Pyrenees dog on the front. There are fixed costs of \$560 to set up for production, and variable costs of \$29 per jacket. Write an equation that can be used to determine the total cost, C , encountered by Marty's Company in producing x jackets, and use the equation to find the total cost of producing 148 jackets.

A) \$4844

B) \$4832

C) \$4852

D) \$4864

Answer: C

- 176) The cost of owning a home includes both fixed costs and variable utility costs. Assume that it costs \$2061 per month for mortgage and insurance payments and it costs an average of \$3.23 per unit for natural gas, electricity, and water usage. (i) Determine a linear function that computes the annual cost of owning this home if x utility units are used. (ii) What does the y -intercept on the graph of the function represent?
- A) $y = 3.23x + 2061$; y -intercept, 2061, represents the minimum cost of owning the home without spending anything on utilities.
 B) $y = -3.23x + 2061$; y -intercept, 2061, represents the minimum cost of owning the home without spending anything on utilities.
 C) $y = 3.23x + 24,732$; y -intercept, 24,732, represents the minimum cost of owning the home for 12 months without spending anything on utilities.
 D) $y = -3.23x + 24,732$; y -intercept, 24,732, represents the minimum cost of owning the home for 12 months without spending anything on utilities.

Answer: C

Provide an appropriate response.

- 177) In the linear equation, $y = mx + b$, b is the ? of the equation.
- A) slope B) domain C) x -intercept D) y -intercept
- Answer: D

- 178) In the linear equation, $y = mx + b$, m is the ? of the equation.
- A) y -intercept B) slope C) range D) x -intercept
- Answer: B

- 179) In the linear equation, $y = -2 + 7x$, -2 is the ? of the equation.
- A) y -intercept B) domain C) slope D) x -intercept
- Answer: A

- 180) If the y -intercept of the linear equation $y = 3x + b$ lies below the x -axis, then what can you say about b ?
- A) $b > 0$ B) $b \geq 0$ C) $b < 0$ D) $b = 0$
- Answer: C

- 181) If $m < 0$, the graph of $y = mx + b$?.
- A) does not represent a function B) is a vertical line
 C) is somewhat flat D) slopes downward to the right
- Answer: D

- 182) For the equation $y = mx + b$, find a formula for the value of x given any value of y .
- A) $x = \frac{my - b}{b}$ B) $x = y - mx - b$ C) $x = \frac{y - b}{m}$ D) $x = \frac{y + b}{m}$
- Answer: C

- 183) A line passes through the points (1, 9) and (1, 3). The equation of this line is ?. The slope of the line is ?.
- A) $y = 1$; 0 B) $y = 1$; undefined C) $x = 1$; 0 D) $x = 1$; undefined
- Answer: D

- 184) A line passes through the points (7, 2) and (6, 2). The equation of this line is ?. The slope of the line is ?.
- A) $y = 2$; undefined B) $x = 2$; undefined C) $x = 2$; 0 D) $y = 2$; 0
- Answer: D

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

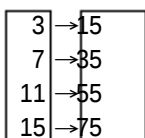
185) Can an equation of a vertical line be written in slope-intercept form? Explain.

Answer: No. In the slope-intercept form of the equation of a line, x is multiplied by slope; however, the slope of a vertical line is undefined. (Explanations will vary.)

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

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

186)



A) domain: {3, 7, 11, 15}
range: {15, 35, 55, 75}
function

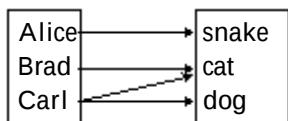
C) domain: {15, 35, 55, 75}
range: {3, 7, 11, 15}
not a function

B) domain: {15, 35, 55, 75}
range: {3, 7, 11, 15}
function

D) domain: {3, 7, 11, 15}
range: {15, 35, 55, 75}
not a function

Answer: A

187)



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

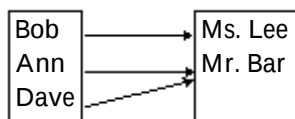
C) domain: {snake, cat, dog}
range: {Alice, Brad, Carl}
not a function

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

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

Answer: B

188)



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

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

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

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

Answer: A

$$189) \begin{array}{c|c|c|c|c} x & 7 & 9 & 7 & 5 \\ \hline y & 6 & 7 & 8 & 2 \end{array}$$

A) domain: {8, 2, 7, 6}
range: {7, 5, 9}
not a function

B) domain: {7, 5, 9}
range: {8, 2, 7, 6}
function

C) domain: {7, 5, 9}
range: {8, 2, 7, 6}
not a function

D) domain: {8, 2, 7, 6}
range: {7, 5, 9}
function

Answer: C

$$190) \begin{array}{c|c|c|c|c} x & -6 & -3 & 3 & 6 \\ \hline y & 11 & 12 & 11 & 12 \end{array}$$

A) domain: {-6, -3, 3, 6}
range: {11, 12}
function

C) domain: {-6, -3, 3, 6}
range: {11, 12}
not a function

B) domain: {11, 12}
range: {-6, -3, 3, 6}
function

D) domain: {11, 12}
range: {-6, -3, 3, 6}
not a function

Answer: A

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

191) $y = -4x - 7$

A) Yes

B) No

Answer: A

192) $4x = 3 - 2y$

A) Yes

B) No

Answer: A

193) $y = x^2 + 3$

A) Yes

B) No

Answer: A

194) $y = 8x^2 - 6x + 4$

A) Yes

B) No

Answer: A

195) $x = y^3$

A) Yes

B) No

Answer: A

196) $x = y^2 + 9$

A) Yes

B) No

Answer: B

197) $x = |-5y|$

A) Yes

B) No

Answer: B

198) $y^2 = 3x$

A) Yes

B) No

Answer: B

199) $y = \sqrt{4x - 7}$

A) Yes

B) No

Answer: A

200) $xy = 7$

A) Yes

B) No

Answer: A

Find the function value.

201) Let $f(x) = x^2 - 4x - 4$. Find $f(-2)$.

A) -8

B) 8

C) 16

D) 0

Answer: B

202) Let $f(x) = \frac{x}{11 - x}$. Find $f\left(-\frac{2}{5}\right)$.

A) $-\frac{2}{57}$

B) $-\frac{57}{2}$

C) $\frac{57}{2}$

D) $\frac{2}{57}$

Answer: A

203) Let $g(x) = \frac{x - 6}{x + 7}$. Find $g(-12.25)$.

A) $\frac{25}{77}$

B) $-\frac{25}{77}$

C) $\frac{73}{21}$

D) 1

Answer: C

204) Let $g(x) = \frac{x}{\sqrt{1 - x^2}}$. Find $g(-1)$.

A) 0

B) does not exist

C) 1

D) 3

Answer: B

205) Let $f(x) = 5x^2 - 8x + 6$. Find $f(-x)$.

A) $4x^2 + 9x + 5$

B) $-5x^2 + 8x - 6$

C) $-5x^2 + 9x + 6$

D) $5x^2 + 8x + 6$

Answer: D

206) Let $g(x) = 4x^3$. Find $g(6 + h)$.

A) $-864 + 432h - 12h^2 + h^3$

B) $864 + 432h + 72h^2 + 4h^3$

C) $216 + 108h + 72h^2 + 5h^3$

D) $864 - 432h + 48h^2 - 4h^3$

Answer: B

207) Let $f(x) = 4|x| + 3x$. Find $f(5y)$.

A) $19|y| + 17y$

B) $4|y| + 3y$

C) $20|y| + 15y$

D) $5|y| + 5y$

Answer: C

208) Let $h(x) = 6x - \sqrt{x^2 - 4}$. Find $h(-x)$.

A) $-6x + \sqrt{x^2 - 4}$

B) $-6x - \sqrt{4 - x^2}$

C) $-6x - \sqrt{x^2 - 4}$

D) $6x - \sqrt{x^2 - 4}$

Answer: C

Find the domain of the function.

209) $f(x) = -8x + 8$

A) $(-\infty, 0) \cup (0, \infty)$

B) $(-\infty, \infty)$

C) $(0, \infty)$

D) $(-8, \infty)$

Answer: B

210) $f(x) = \frac{x}{x-7}$

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

B) $(0, \infty)$

C) $(-\infty, 0)$

D) $(-\infty, 7) \cup (7, \infty)$

Answer: D

211) $f(x) = \frac{5}{x+9}$

A) $(-\infty, -9) \cup (-9, \infty)$

B) $(-\infty, \infty)$

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

D) $(-\infty, 9)$

Answer: A

212) $f(x) = \frac{1}{x^2 + 4x - 21}$

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

C) $(-\infty, 3) \cup (3, \infty)$

B) $(-\infty, \infty)$

D) $(-\infty, -7) \cup (-7, 3) \cup (3, \infty)$

Answer: D

213) $f(x) = \frac{x^4 - 6x^3 + 4}{3x^2 - 13x - 56}$

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

C) $\left(-\infty, -\frac{8}{3}\right) \cup \left(-\frac{8}{3}, 7\right) \cup (7, \infty)$

B) $(-\infty, -7) \cup \left(-7, \frac{8}{3}\right) \cup \left(\frac{8}{3}, \infty\right)$

D) $\left(-\infty, -\frac{8}{3}\right) \cup \left(-\frac{8}{3}, \infty\right)$

Answer: C

214) $f(x) = \sqrt{14-x}$

A) $(-\infty, 14]$

B) $(\sqrt{14}, \infty)$

C) $(-\infty, \infty)$

D) $(-\infty, 14) \cup (14, \infty)$

Answer: A

215) $f(x) = \frac{(x+5)(x-5)}{x^2 - 25}$

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

C) $(25, \infty)$

B) $(\infty, 25) \cup (25, \infty)$

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

Answer: D

216) $f(x) = \frac{(x+2)(x-2)}{x^2 + 4}$

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

C) $(4, \infty)$

B) $(\infty, 4) \cup (4, \infty)$

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

Answer: D

217) $H(x) = \frac{x}{\sqrt{x-9}}$

A) $[9, \infty)$

B) $(-\infty, 9) \cup (9, \infty)$

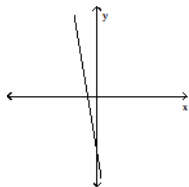
C) $(-\infty, \infty)$

D) $(9, \infty)$

Answer: D

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

218)

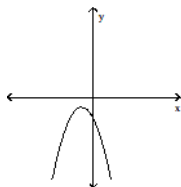


A) Yes

B) No

Answer: A

219)

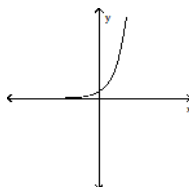


A) Yes

B) No

Answer: A

220)

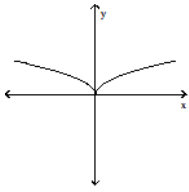


A) Yes

B) No

Answer: A

221)

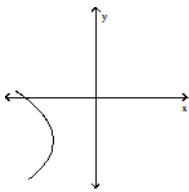


A) Yes

B) No

Answer: A

222)

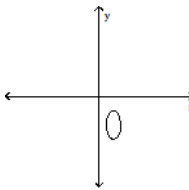


A) Yes

B) No

Answer: B

223)

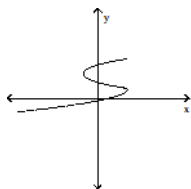


A) Yes

B) No

Answer: B

224)



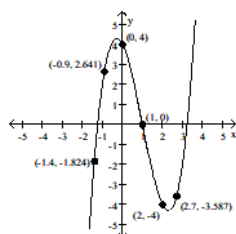
A) Yes

B) No

Answer: B

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

225) $f(-0.9)$



A) -1.34

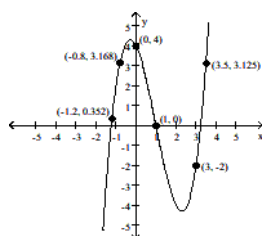
B) 1

C) 2.1

D) 2.641

Answer: D

226) $g(-1.2)$



A) 0.352

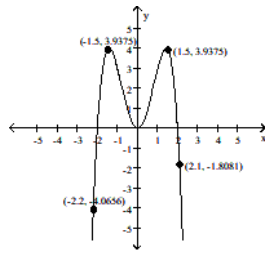
B) -2.5

C) 4.238

D) 3

Answer: A

227) $g(1.5)$



A) 2.1

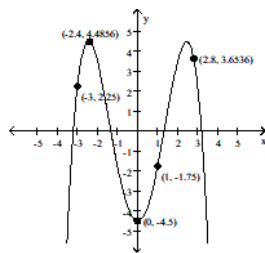
B) -1.5

C) -4.0656

D) 3.9375

Answer: D

228) $g(2.8)$



A) 3

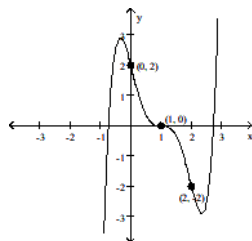
B) -2.4

C) 3.6536

D) -1.75

Answer: C

229) $f(1)$



A) 0

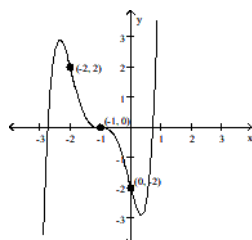
B) 1

C) -2

D) 2

Answer: A

230) $g(0)$



A) -1

B) -2

C) 1

D) 2

Answer: B

Solve the problem.

231) Let $g(x) = x^2 - 5x - 29$. Find x such that $(x, 7)$ is on the graph of $f(x)$.

A) $x = -4$ or 9

B) $x = -9$ or 4

C) $x = 9$

D) no solution

Answer: A

232) Let $h(x) = x^2 + 4x + 9$. Find x such that $(x, 3)$ is on the graph of $h(x)$.

A) $x = 4 \pm 3$

B) $x = 0$

C) no solution

D) $x = -4 \pm \sqrt{3}$

Answer: C

233) Let $f(x) = 3(x - 5)^2 + 6$. Find x such that $(x, 12)$ is on the graph of $f(x)$.

A) $x = 5 \pm \sqrt{2}$

B) $x = 5 \pm \sqrt{6}$

C) no solution

D) $x = -5 \pm \sqrt{2}$

Answer: A

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

A) $x = -2$

B) no solution

C) $x = 2$

D) $x = \pm 2$

Answer: C

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

235) $f(x) = -3x + 9$; $a = 1$, $b = 4$

A) -3

B) $-\frac{1}{3}$

C) 0

D) 3

Answer: A

236) $g(x) = 3x - 7$; $a = -1$, $b = 2$

A) $\frac{1}{3}$

B) 3

C) -3

D) 0

Answer: B

237) $h(x) = 4x^2$; $a = 1$, $b = 5$

A) 24

B) -16

C) -24

D) 16

Answer: A

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

A) 6

B) 0

C) -4

D) -6

Answer: A

239) $g(x) = 5 - x^2$; $a = -1$, $b = 7$

A) 6

B) -8

C) 8

D) -6

Answer: D

240) $h(x) = (5 - x)^2$; $a = 3$, $b = 5$

A) 18

B) 0

C) -12

D) -2

Answer: D

241) $g(x) = (x - 1)^2$; $a = 4$, $b = 7$

A) 13

B) -1

C) -5

D) 9

Answer: D

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

A) 19

B) -19

C) 7

D) 1

Answer: B

243) $h(x) = \frac{1}{x}$; $a = -5$, $b = 5$

A) $\frac{1}{25}$

B) $\frac{1}{5}$

C) 0

D) $-\frac{1}{25}$

Answer: A

244) $g(x) = \frac{3}{x+3}$; $a = 3$, $b = 7$

A) $-\frac{1}{10}$

B) $\frac{1}{20}$

C) $-\frac{3}{20}$

D) $-\frac{1}{20}$

Answer: D

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

245) $f(x) = 10x - 8$

A) $-10h$

B) $\frac{4}{5}$

C) 10

D) 8

Answer: C

246) $f(x) = 6x^2 + 6x$

A) $12x + 6h + 6$

B) $12x^2 + 6h + 6x$

C) $18x - 8h + 12$

D) $12x + 6$

Answer: A

247) $f(x) = \frac{1}{7x}$

A) $\frac{1}{7x}$

B) $\frac{-1}{7x(x+h)}$

C) 0

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

Answer: B

State whether the given relation is a function.

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

A) Yes

B) No

Answer: A

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

A) Yes

B) No

Answer: B

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

A) Yes

B) No

Answer: B

Solve the problem.

251) A formula relating an athlete's vertical leap V , in inches, to hang time t , in seconds, is $V(t) = 48t^2$. A professional basketball player has a vertical leap of 39 inches. What is his hang time? Round your answer to the nearest tenth of a second.

A) 0.9 sec

B) 0.6 sec

C) 0.8 sec

D) 1 sec

Answer: A

- 252) A stone thrown downward with an initial velocity of 44.1 m/sec will travel a distance of s meters, where $s(t) = 4.9t^2 + 44.1t$ and t is in seconds. If a stone is thrown downward at 44.1 m/sec from a height of 343 m, how long will it take the stone to hit the ground? Round your answer to the nearest second.
- A) 9 sec B) 19 sec C) 5 sec D) 14 sec
- Answer: C

- 253) If there are x teams in a sports league and all the teams play each other twice, a total of $N(x)$ games are played, where $N(x) = x^2 - x$. A soccer league has 8 teams, each of which plays the others twice. If the league pays \$49 per game for the field and officials, how much will it cost to play the entire schedule?
- A) \$3136 B) \$2744 C) \$2842 D) \$3528
- Answer: B

- 254) Under certain conditions, the power P , in watts per hour, generated by a windmill with winds blowing v miles per hour is given by $P(v) = 0.015v^3$. Find the power generated by 19-mph winds.
- A) 102.885 watts per hr B) 6859 watts per hr
C) 5.415 watts per hr D) 0.00006412 watts per hr
- Answer: A

- 255) Assume that a person's threshold weight W , defined as the weight above which the risk of death rises dramatically, is given by $W(h) = \left(\frac{h}{12.3}\right)^3$, where W is in pounds and h is the person's height in inches. Find the threshold weight for a person who is 6 ft 6 in. tall. Round your answer to the nearest pound.
- A) 285.6 lb B) 154.5 lb C) 255 lb D) 221.5 lb
- Answer: C

- 256) The function, $S(x) = 0.0031x^4 - 0.0056x^3 + 0.0046x^2 + 0.11x + 1.97$, gives the predicted sales volume of a company, in millions of items, where x is the number of years from now. Determine the predicted sales 9 years from now. Round your answer to two decimals, if necessary.
- A) 19.59 million B) 18.88 million C) 38.42 million D) 35.34 million
- Answer: A

- 257) $A(x) = -0.015x^3 + 1.05x$ gives the alcohol level in an average person's bloodstream x hours after drinking 8 oz of 100-proof whiskey. If the level exceeds 1.5 units, a person is legally drunk. Would a person be drunk after 6 hours?
- A) Yes B) No
- Answer: A

- 258) The position of an object moving in a straight line is given by $s(t) = 9t^2 - 5t$, where s is in meters and t is the time in seconds the object has been in motion. How far will an object move in 17 seconds?
- A) 1156 m B) 2516 m C) 1292 m D) 68 m
- Answer: B

Find the intervals over which the given function is increasing, is decreasing, or is constant.

- 259) $f(x) = -8$
- A) constant on $(8, -8)$ B) increasing on $(-\infty, \infty)$
C) constant on $(-\infty, \infty)$ D) decreasing on $(-\infty, \infty)$
- Answer: C

260) $f(x) = 2x + 4$

- A) constant on $(2, 4)$
C) increasing on $(-\infty, \infty)$

Answer: C

- B) decreasing on $(-\infty, 2/4)$; increasing on $(2/4, \infty)$
D) decreasing on $(-\infty, \infty)$

261) $f(x) = -4x + 5$

- A) increasing on $(-\infty, \infty)$
C) decreasing on $(-\infty, -4/5)$; increasing on $(-4/5, \infty)$

Answer: B

- B) decreasing on $(-\infty, \infty)$
D) constant on $(-4, 5)$

262) $f(x) = 4x^2 + 2$

- A) decreasing on $(-\infty, 2/4)$
C) increasing on $(2/4, \infty)$

Answer: D

- B) increasing on $(-\infty, 0)$; decreasing on $(0, \infty)$
D) decreasing on $(-\infty, 0)$; increasing on $(0, \infty)$

263) $f(x) = -5x^2 - 1$

- A) decreasing on $(-\infty, 0)$; increasing on $(0, \infty)$
C) increasing on $(-\infty, -1/5)$

Answer: D

- B) decreasing on $(-1/5, \infty)$
D) increasing on $(-\infty, 0)$; decreasing on $(0, \infty)$

264) $f(x) = -5x^3$

- A) decreasing on $(-\infty, 0)$, increasing on $(0, \infty)$
C) constant on $(-\infty, \infty)$

Answer: D

- B) increasing on $(-\infty, \infty)$
D) decreasing on $(-\infty, \infty)$

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

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

- A) Even

B) Odd

C) Neither

Answer: A

266) $f(x) = -7x^5 + 4x^3$

- A) Even

B) Odd

C) Neither

Answer: B

267) $f(x) = -2x^4 - 6x - 8$

- A) Even

B) Odd

C) Neither

Answer: C

268) $f(x) = 4$

- A) Even

B) Odd

C) Neither

Answer: A

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

- A) Even

B) Odd

C) Neither

Answer: A

270) $f(x) = \frac{x}{x^2 + 5}$

A) Even

B) Odd

C) Neither

Answer: B

271) $f(x) = \frac{-x^3}{3x^2 - 8}$

A) Even

B) Odd

C) Neither

Answer: B

272)

x	-3	-2	-1	0	1	2	3
f(x)	-20.3	-15	-4.51	5	-4.51	-15	-20.3

A) Even

B) Odd

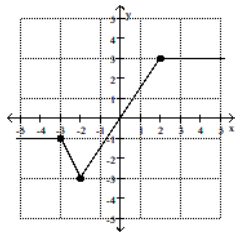
C) Neither

Answer: A

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

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

273)



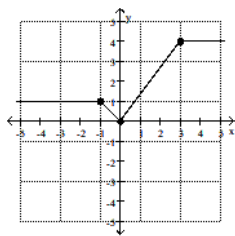
Answer: a. Domain: $(-\infty, \infty)$; Range: $[-3, 3]$

b. x-intercept: 0; y-intercept: 0

c. constant on $(-\infty, -3]$, decreasing on $(-3, 2)$, increasing on $(2, \infty)$

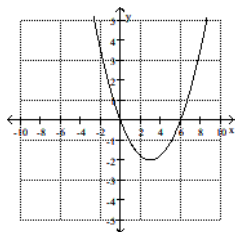
d. Neither even nor odd.

274)



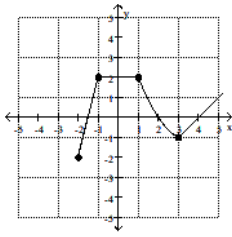
- Answer: a. Domain: $(-\infty, \infty)$; Range: $[0, 4]$
 b. x-intercept: 0; y-intercept: 0
 c. constant on $(-\infty, -1)$, decreasing on $(-1, 0)$, increasing on $(0, 3)$, constant on $(3, \infty)$
 d. Neither even nor odd.

275)



- Answer: a. Domain: $(-\infty, \infty)$; Range: $[-2, \infty)$
 b. x-intercepts: 0, 6; y-intercept: 0
 c. decreasing on $(-\infty, 3)$, increasing on $(3, \infty)$
 d. Neither even nor odd.

276)



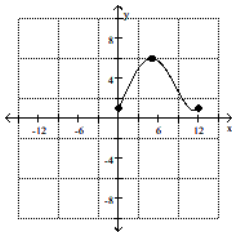
Answer: a. Domain: $[-2, \infty)$; Range: $[-2, \infty)$

b. x-intercepts: $-\frac{3}{2}, 2, 4$; y-intercept: 2

c. increasing on $(-2, -1)$, constant on $(-1, 1)$, decreasing on $(1, 3)$, increasing on $(3, \infty)$

d. Neither even nor odd.

277)



Answer: a. Domain: $[0, 12]$; Range: $[1, 6]$

b. x-intercept: none; y-intercept: 1

c. increasing on $(0, 5)$, decreasing on $(5, 12)$

d. Neither even nor odd.

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

Find the requested value.

278) Find $f(10)$ for

$$f(x) = \begin{cases} 20, & \text{if } x < 8 \\ -20, & \text{if } x > 8 \end{cases}$$

A) -20

B) -400

C) 20

D) undefined

Answer: A

279) Find $f(-9)$ for

$$f(x) = \begin{cases} 3x, & \text{if } x \leq -1 \\ x - 9, & \text{if } x > -1 \end{cases}$$

A) -27

B) 0

C) -18

D) 27

Answer: A

280) Find $f(0)$ for

$$f(x) = \begin{cases} x - 4, & \text{if } x < 8 \\ 9 - x, & \text{if } x \geq 8 \end{cases}$$

A) 4

B) -4

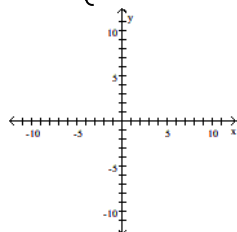
C) 9

D) 1

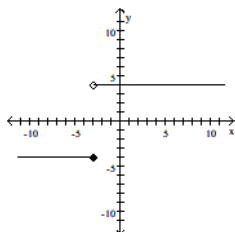
Answer: B

Graph the function.

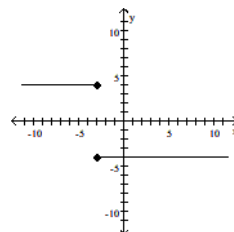
$$281) f(x) = \begin{cases} 4 & \text{if } x > -3 \\ -4 & \text{if } x \leq -3 \end{cases}$$



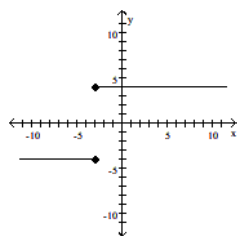
A)



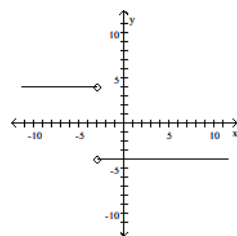
B)



C)

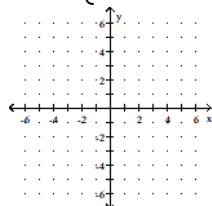


D)

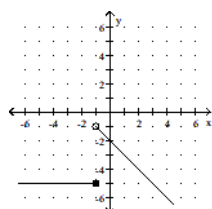


Answer: A

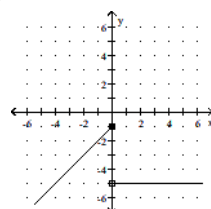
$$282) f(x) = \begin{cases} x - 1 & \text{if } x > 0 \\ -5 & \text{if } x \leq 0 \end{cases}$$



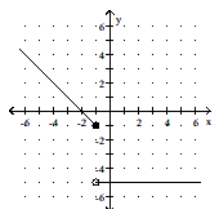
A)



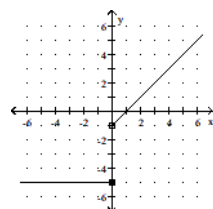
B)



C)

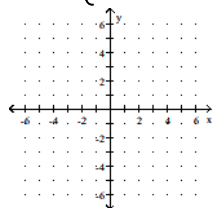


D)

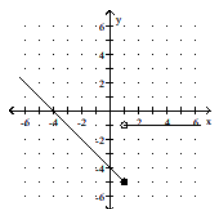


Answer: D

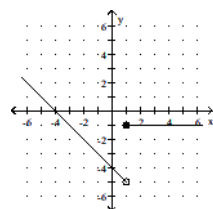
$$283) f(x) = \begin{cases} -1 & \text{if } x \geq 1 \\ -4 - x & \text{if } x < 1 \end{cases}$$



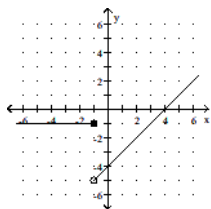
A)



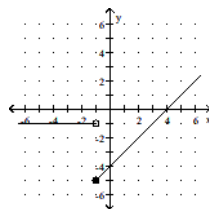
B)



C)

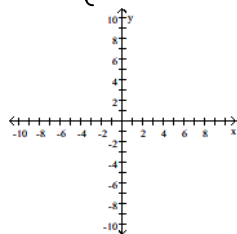


D)

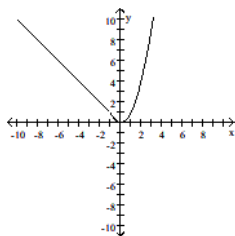


Answer: B

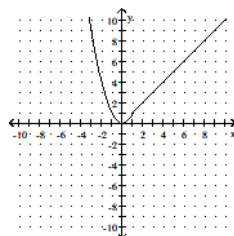
$$284) f(x) = \begin{cases} |x| & \text{if } x \leq 1 \\ x^2 & \text{if } x > 1 \end{cases}$$



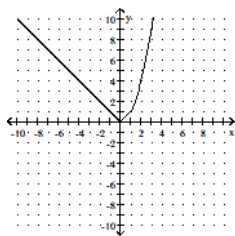
A)



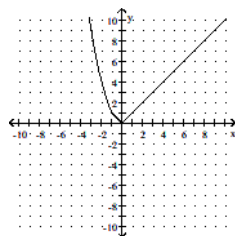
B)



C)

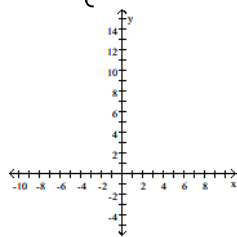


D)

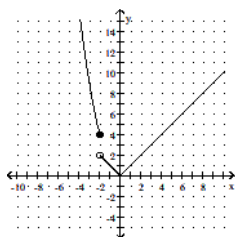


Answer: C

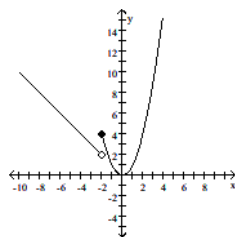
$$285) f(x) = \begin{cases} |x| & \text{if } x \leq -2 \\ x^2 & \text{if } x > -2 \end{cases}$$



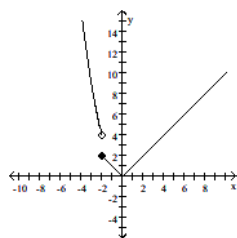
A)



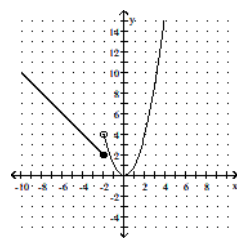
B)



C)

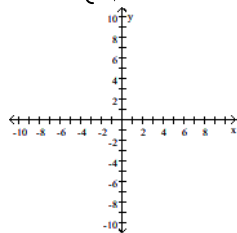


D)

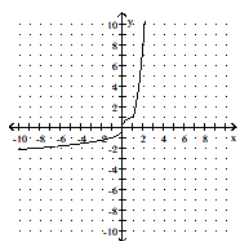


Answer: D

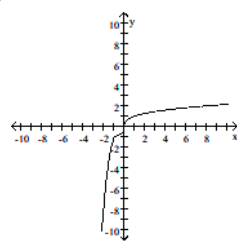
$$286) f(x) = \begin{cases} x^3 & \text{if } x \leq 1 \\ \sqrt[3]{x} & \text{if } x > 1 \end{cases}$$



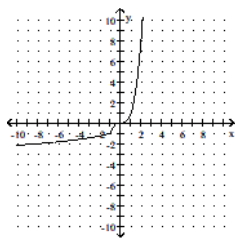
A)



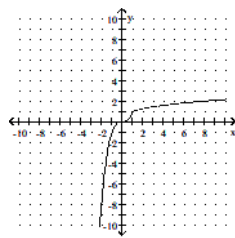
B)



C)

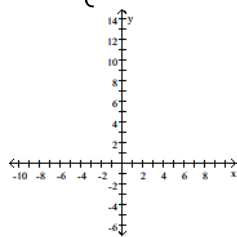


D)

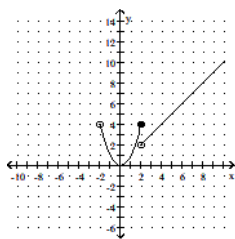


Answer: D

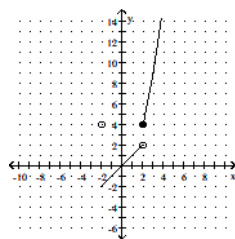
$$287) f(x) = \begin{cases} x^2 & \text{if } -2 < x \leq 2 \\ x & \text{if } x > 2 \end{cases}$$



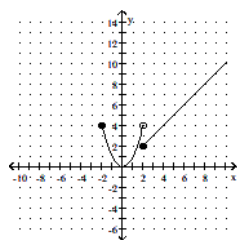
A)



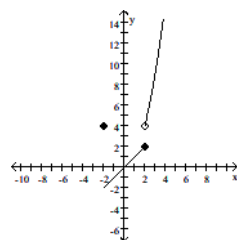
B)



C)

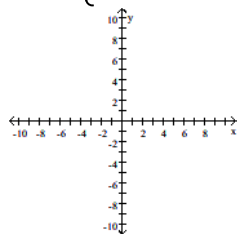


D)

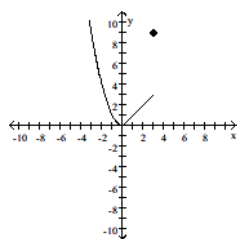


Answer: A

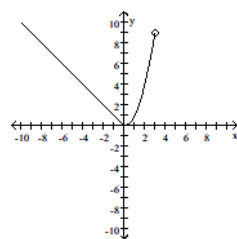
$$288) f(x) = \begin{cases} |x| & \text{if } x \leq 0 \\ x^2 & \text{if } 0 < x \leq 3 \end{cases}$$



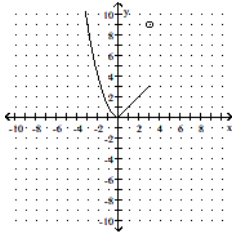
A)



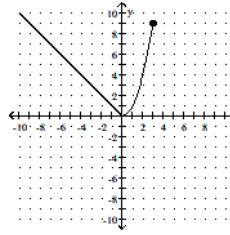
B)



C)



D)



Answer: D

Solve the problem.

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

A) $V(t) = \frac{t-10}{32}$

B) $V(t) = 32 + 10t$

C) $V(t) = 32t + 10$

D) $V(t) = 42t$

Answer: C

290) If an object is dropped from a tower, then the velocity, V (in feet per second), of the object after t seconds can be obtained by multiplying t by 32 and adding 10 to the result. Find V as a linear function of t , and use this function to evaluate $V(5.6)$, the velocity of the object at time $t = 5.6$ seconds.

A) $V(5.6) = 189.2$ ft/sec

B) $V(5.6) = 188.5$ ft/sec

C) $V(5.6) = 190.5$ ft/sec

D) $V(5.6) = 187.2$ ft/sec

Answer: A

291) Assume that the sales of a certain appliance dealer are approximated by a linear function. Suppose that sales were \$8500 in 1982 and \$88,000 in 1987. Let $x = 0$ represent 1982. Find the equation giving yearly sales $S(x)$.

A) $S(x) = 79,500x + 88,000$

B) $S(x) = 15,900x + 8500$

C) $S(x) = 15,900x + 88,000$

D) $S(x) = 79,500x + 8500$

Answer: B

292) The charges for renting a moving van are \$65 for the first 30 miles and \$8 for each additional mile. Assume that a fraction of a mile is rounded up. Find a symbolic representation for a function f that computes the cost of driving the van x miles, where $0 < x \leq 100$. (Hint: express f as a piecewise-constant function.) Then, determine the cost of driving the van 90 miles.

A) $f(x) = \begin{cases} 65 & \text{if } 0 < x \leq 30 \\ 65 + 8(x - 30) & \text{if } 30 < x \leq 100 \end{cases}; \545

B) $f(x) = \begin{cases} 65x & \text{if } 0 < x \leq 30 \\ 65x + 8(x - 30) & \text{if } 30 < x \leq 100 \end{cases}; \6330

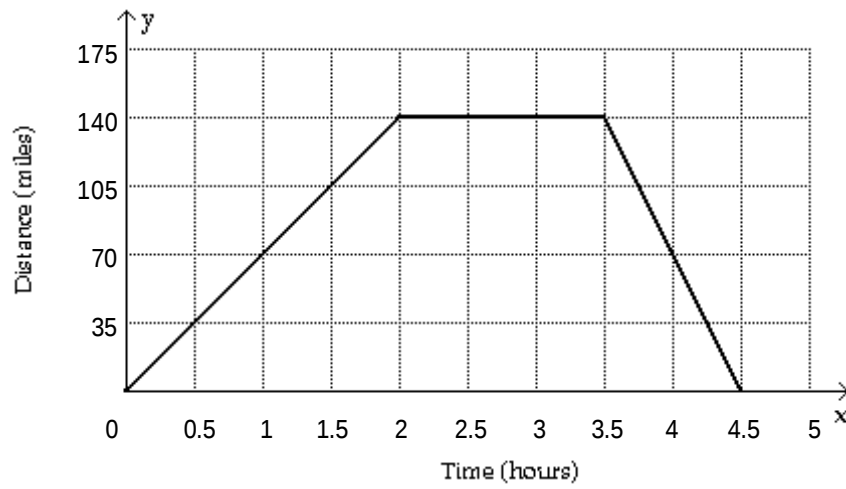
C) $f(x) = \begin{cases} 65 & \text{if } 0 < x \leq 30 \\ 65 + 8(x + 30) & \text{if } 30 < x \leq 100 \end{cases}; \1025

D) $f(x) = \begin{cases} 65 & \text{if } 0 < x \leq 30 \\ 65 + 8(x - 30) & \text{if } 30 < x \leq 100 \end{cases}; \1025

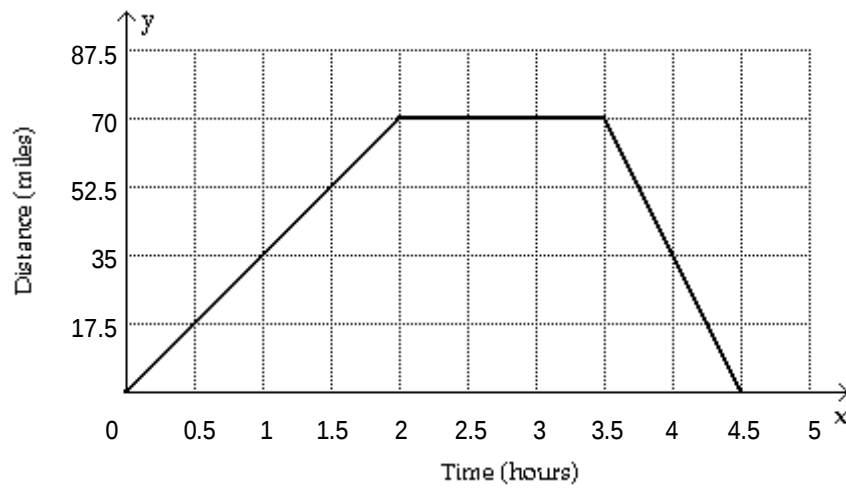
Answer: A

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

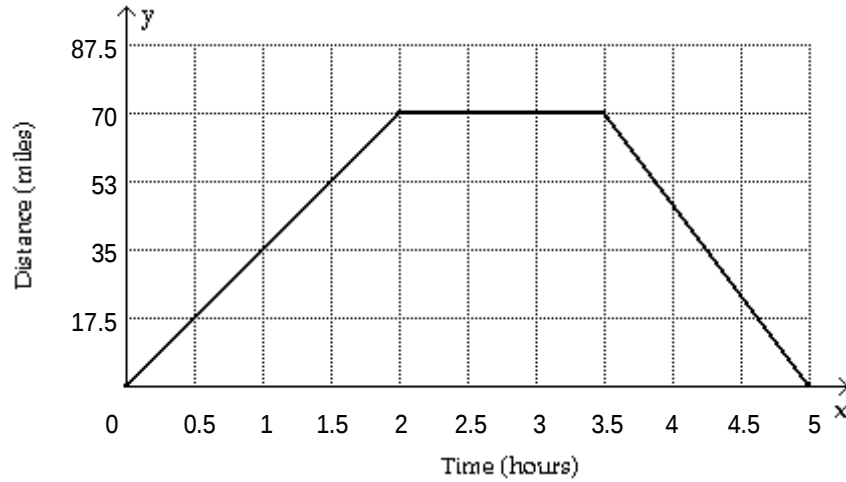
A)



B)



C)



Answer: B

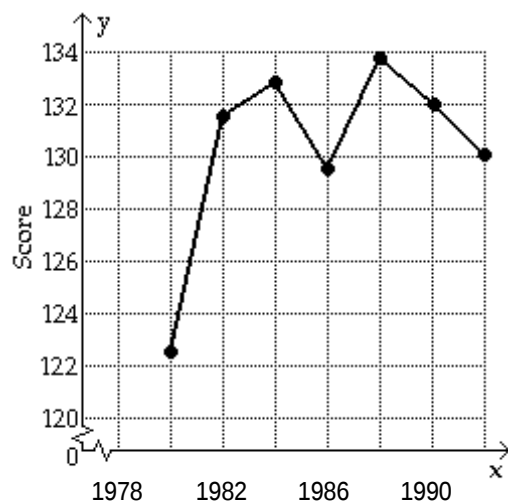
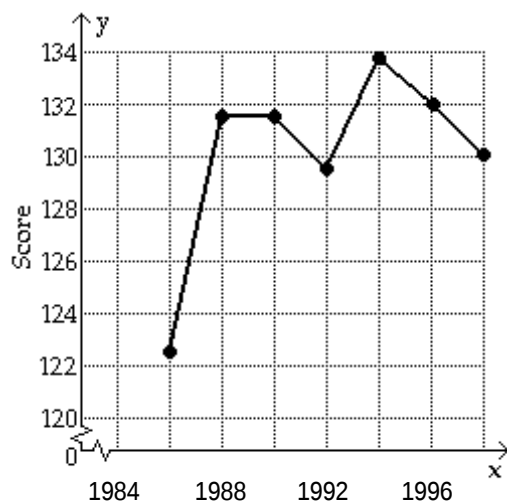
294) The table lists the average composite scores on a national entrance exam for selected years.

Year	1980	1982	1984	1986	1988	1990	1992
Score	122.7	131.5	131.5	129.5	133.9	132.0	130.0

Make a line graph of the data. If the graph represents a piecewise-linear function f , find a symbolic representation for the piece of f located on the interval $[1982, 1984]$.

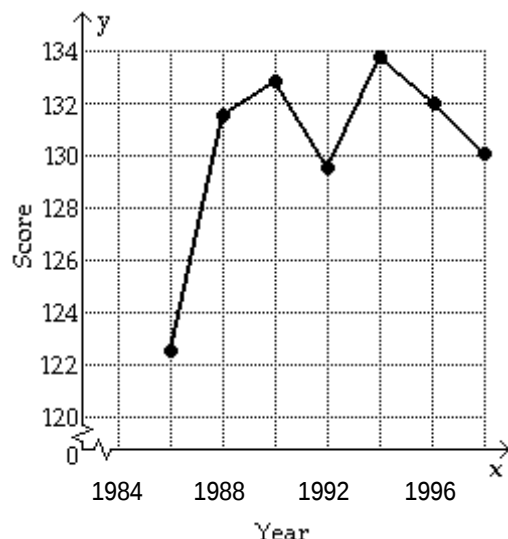
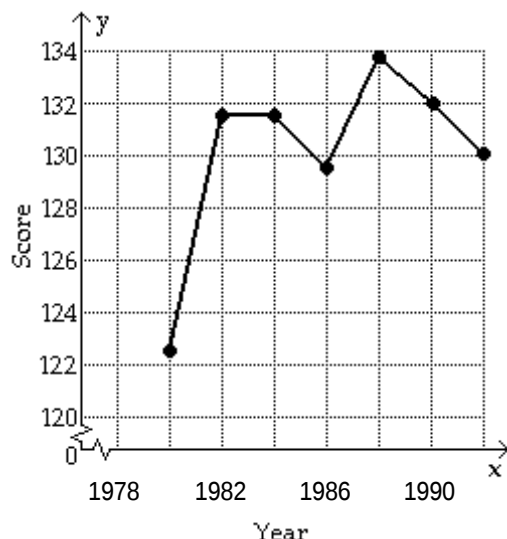
A) $f(x) = 4.4x - 8598.1$ if $1986 \leq x \leq 1988$

B) $f(x) = 0.75x - 1356.5$ if $1982 \leq x \leq 1986$



C) $f(x) = 131.5$ if $1982 \leq x \leq 1984$

D) $f(x) = 122.7$ if $1986 \leq x \leq 1988$



Answer: C

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

Year	1984	1986	1988	1990	1992	1994	1996
Score	122.7	131.5	131.5	129.5	133.9	132.0	130.0

Evaluate $f(1991)$.

A) 131.5

B) 130.5

C) 131.7

D) 130.9

Answer: C

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

$$f(x) = \begin{cases} 0.076(x - 1945) + 0.37 & \text{if } 1945 \leq x < 1970 \\ 0.182(x - 1970) + 3.09 & \text{if } 1970 \leq x \leq 1995 \end{cases}$$

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

A) \$3.47, \$0.37, \$6.73

B) \$0.75, \$2.27, \$6.73

C) \$0.75, \$3.09, \$6.73

Answer: C

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

297) $f(x) = |x|$; $g(x) = -8|x|$

A) Stretch horizontally by a factor of 8. Reflect it across the x -axis.

B) Stretch vertically by a factor of 8. Reflect it across the x -axis.

C) Stretch vertically by a factor of 8. Reflect it across the y -axis.

D) Stretch horizontally by a factor of 8. Reflect it across the y -axis.

Answer: B

298) $f(x) = \sqrt{x}$; $g(x) = -\sqrt{x+5}$

A) Shift -5 units to the left. Reflect it across the x -axis.

B) Shift 5 units to the left. Reflect it across the y -axis.

C) Shift 5 units to the right. Reflect it across the x -axis.

D) Shift 5 units to the left. Reflect it across the x -axis.

Answer: D

299) $f(x) = x^2$; $g(x) = (x - 4)^2 - 10$

A) Shift 10 units to the right and 4 units downward.

B) Shift 4 units to the left and 10 units upward.

C) Shift 4 units to the left and 10 units downward.

D) Shift 4 units to the right and 10 units downward.

Answer: D

300) $f(x) = x^3$; $g(x) = -5x^3 + 7$

A) Stretch vertically by a factor of 5. Reflect it across the x -axis. Shift it 7 units downward.

B) Stretch vertically by a factor of 5. Reflect it across the x -axis. Shift it 7 units upward.

C) Stretch vertically by a factor of 5. Reflect it across the y -axis. Shift it 7 units upward.

D) Stretch vertically by a factor of 7. Reflect it across the x -axis. Shift it 5 units upward.

Answer: B

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

A) Shift it 4 units to the right and 10 units up.

B) Shift it 4 units to the left and 10 units down.

C) Stretch vertically by a factor of $\frac{1}{4}$. Shift it 10 units up.

D) Stretch vertically by a factor of 4. Shift it 10 units up.

Answer: D

302) $f(x) = \frac{1}{x}$; $g(x) = \frac{1}{x+5} - 8$

- A) Stretch horizontally by a factor of $\frac{1}{2}$. Shift it 8 units down.
- B) Shift it 5 units to the left and 8 units up.
- C) Stretch vertically by a factor of 8 and shift it 5 units to the right.
- D) Shift it 5 units to the left and 8 units down.

Answer: D

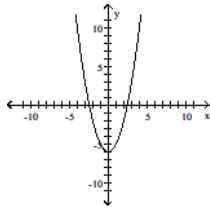
303) $f(x) = x^2$; $g(x) = -(x - 10)^2 + 5$

- A) Shift it 10 units to the right. Reflect it across the y-axis. Shift it 5 units up.
- B) Shift it 10 units to the right. Reflect it across the x-axis. Shift it 5 units up.
- C) Shift it 10 units to the right. Reflect it across the y-axis. Shift it 5 units down.
- D) Shift it 10 units to the left. Reflect it across the x-axis. Shift it 5 units up.

Answer: B

Match the graph with its corresponding function.

304)



A) $g(x) = (x - 6)^2$

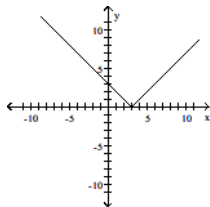
B) $g(x) = x^2 - 6$

C) $g(x) = x^2 + 6$

D) $g(x) = 6x^2$

Answer: B

305)



A) $g(x) = |x + 3|$

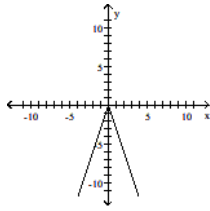
B) $g(x) = |x| - 3$

C) $g(x) = 3x^3$

D) $g(x) = |x - 3|$

Answer: D

306)



A) $g(x) = |x - 3|$

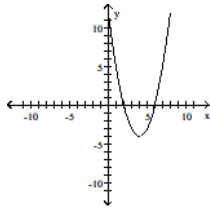
B) $g(x) = |x + 3|$

C) $g(x) = -3|x|$

D) $g(x) = |x| - 3$

Answer: C

307)



A) $g(x) = (x - 6)^2 - 4$

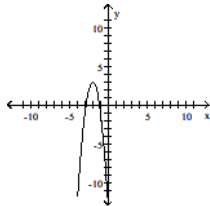
B) $g(x) = 6(x + 4)^2$

C) $g(x) = (x - 4)^2 - 4$

D) $g(x) = -6(x - 4)^2$

Answer: C

308)



A) $g(x) = 4(x - 2)^2 - 3$

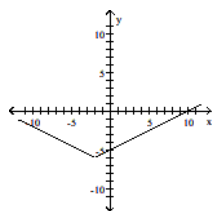
B) $g(x) = (x + 2)^2 + 3$

C) $g(x) = -4(x + 2)^2 + 3$

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

Answer: C

309)



A) $g(x) = 0.5|x - 2| + 6$

C) $g(x) = 6|x - 2| + 0.5$

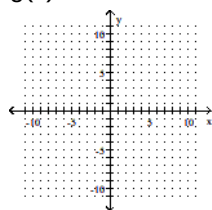
B) $g(x) = 0.5|x + 2| - 6$

D) $g(x) = 6|x + 2| - 0.5$

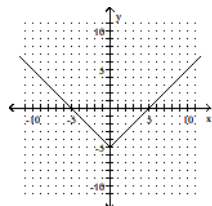
Answer: B

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

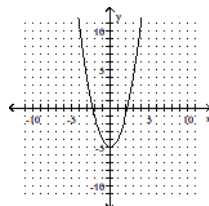
310) $g(x) = x^2 - 5$



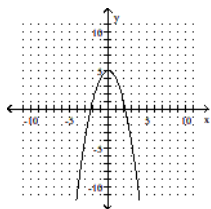
A)



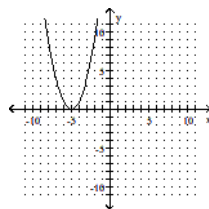
B)



C)

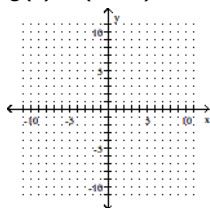


D)

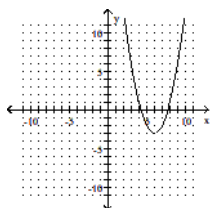


Answer: B

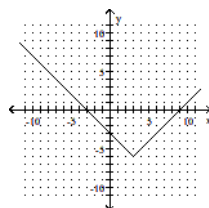
311) $g(x) = (x - 3)^2 - 6$



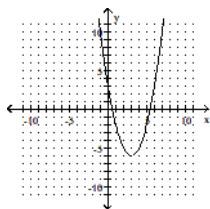
A)



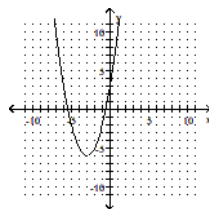
B)



C)

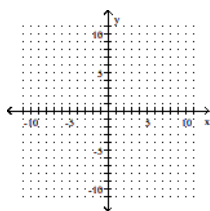


D)

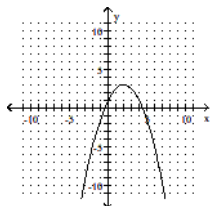


Answer: C

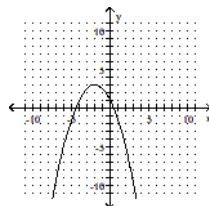
$$312) g(x) = -\frac{1}{2}(x+2)^2 + 3$$



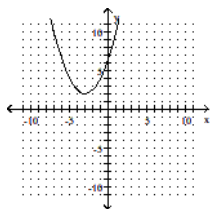
A)



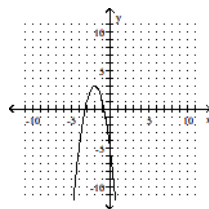
B)



C)

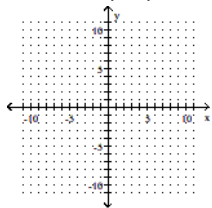


D)

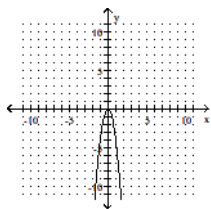


Answer: B

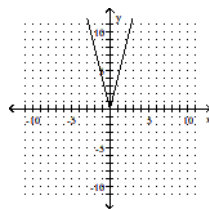
313) $g(x) = -4|x|$



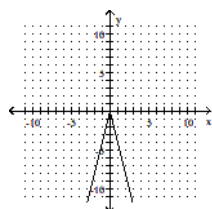
A)



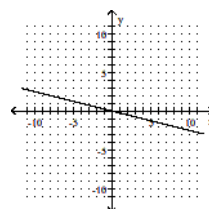
B)



C)

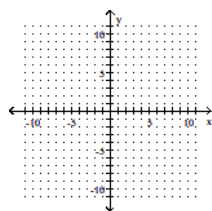


D)

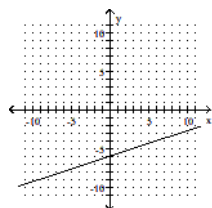


Answer: C

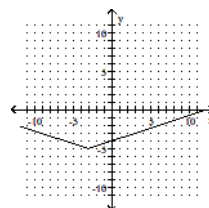
$$314) g(x) = \frac{1}{3} |x + 3| - 5$$



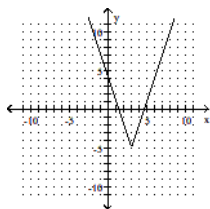
A)



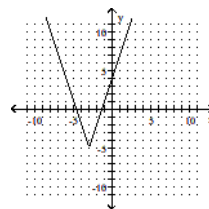
B)



C)

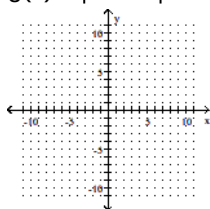


D)

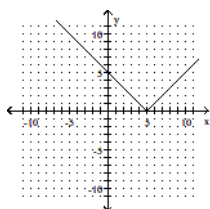


Answer: B

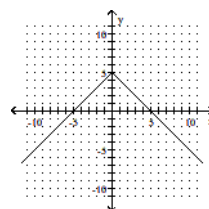
315) $g(x) = |x - 5|$



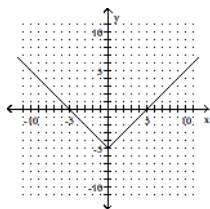
A)



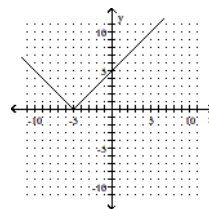
B)



C)

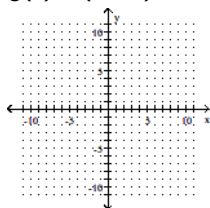


D)

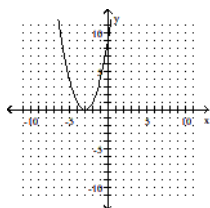


Answer: A

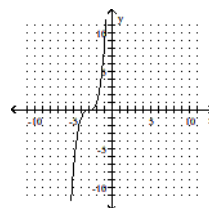
316) $g(x) = (x + 3)^3$



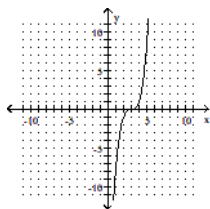
A)



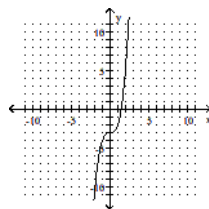
B)



C)

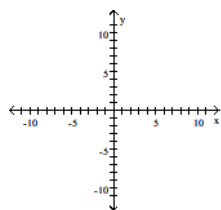


D)

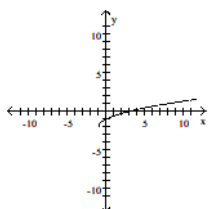


Answer: B

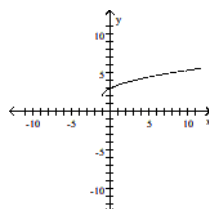
317) $g(x) = -\sqrt{x+1} - 2$



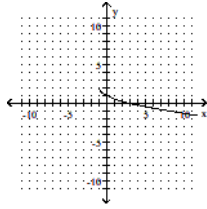
A)



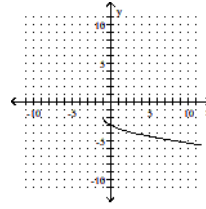
B)



C)



D)



Answer: D

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

318) The graph of $f(x) = x^2$ is vertically stretched by a factor of 4, and the resulting graph is reflected across the x-axis.

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

B) $f(x) = 4x^2$

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

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

Answer: C

319) The graph of $f(x) = x^2$ is shifted 10 units to the left and 3 units downward.

A) $y = (x - 3)^2 + 10$

B) $y = (x - 10)^2 - 3$

C) $y = (x + 10)^2 - 3$

D) $y = (x + 3)^2 - 10$

Answer: C

320) The graph of $f(x) = x^2$ is shifted 4 units to the left. This graph is then vertically stretched by a factor of 5 and reflected across the x-axis. Finally, the graph is shifted 7 units downward.

A) $y = -5(x - 4)^2 - 7$

B) $y = -5(x - 4)^2 + 7$

C) $y = -5(x + 7)^2 - 4$

D) $y = -5(x + 4)^2 - 7$

Answer: D

321) The graph of $f(x) = x^2$ is shifted 3 units to the left. This graph is then vertically shrunk by a factor of $\frac{1}{6}$ and reflected across the x-axis. Finally, the graph is shifted 7 units downward.

A) $y = \frac{1}{6}(x - 3)^2 - 7$

B) $y = -\frac{1}{6}(x - 3)^2 - 7$

C) $y = -\frac{1}{6}(x - 3)^2 + 7$

D) $y = -\frac{1}{6}(x + 3)^2 - 7$

Answer: D

322) The graph of $f(x) = |x|$ is vertically stretched by a factor of 7, and the resulting graph is reflected across the x-axis.

A) $y = -|x + 7|$

B) $y = -7|-x|$

C) $y = 7|-x|$

D) $y = -7|x|$

Answer: D

323) The graph of $f(x) = |x|$ is reflected across the y-axis. This graph is then vertically stretched by a factor of 1.9. Finally, the graph is shifted 2 units downward.

A) $f(x) = 1.9|-x| + 2$

B) $f(x) = 1.9|-x| - 2$

C) $f(x) = -1.9|x| - 2$

D) $f(x) = 2|-x| - 1.9$

Answer: B

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

A) $y = -\frac{2}{3}|-x| + 2$

B) $y = \frac{2}{3}|x + 2|$

C) $y = \frac{2}{3}|x| + 2$

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

Answer: A

325) The graph of $f(x) = \sqrt{x}$ is shifted 4 units to the right.

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

B) $y = \sqrt{x - 4}$

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

D) $y = \sqrt{x} - 4$

Answer: B

326) The graph of $f(x) = \sqrt{x}$ is shifted 6 units to the left and then shifted 7 units upward.

A) $f(x) = \sqrt{x + 7} + 6$

B) $f(x) = 7\sqrt{x + 6}$

C) $f(x) = \sqrt{x - 6} + 7$

D) $f(x) = \sqrt{x + 6} + 7$

Answer: D

327) The graph of $f(x) = x^4$ shifted right 7 units and up 5 units.

A) $y = (x - 7)^4 + 5$

B) $y = -(x - 7)^4 + 5$

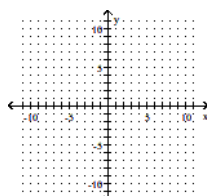
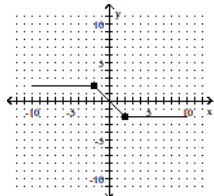
C) $y = (x + 7)^4 - 5$

D) $y = -(x - 7)^4 + 35$

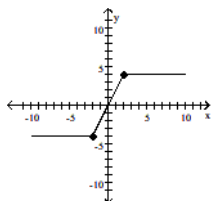
Answer: A

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

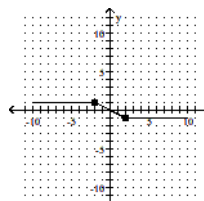
328) $g(x) = 2f(x)$



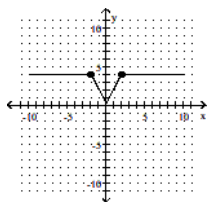
A)



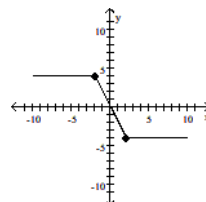
B)



C)

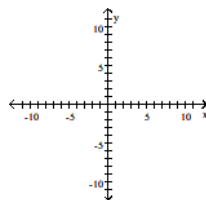
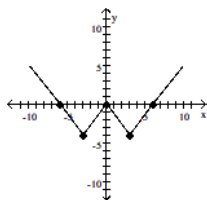


D)

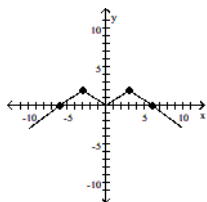


Answer: D

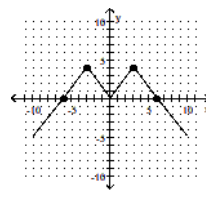
329) $g(x) = -\frac{1}{2}f(x)$



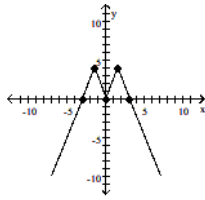
A)



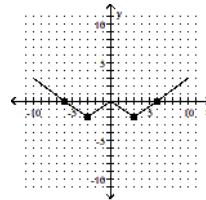
B)



C)

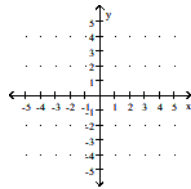
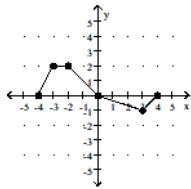


D)

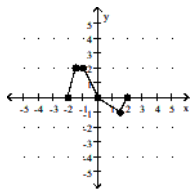


Answer: A

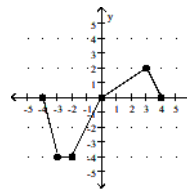
330) $g(x) = f(2x)$



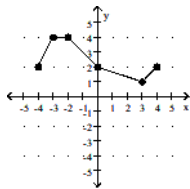
A)



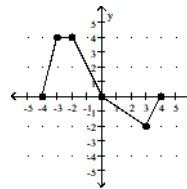
B)



C)

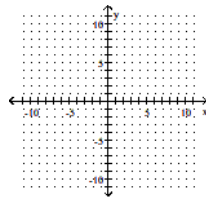
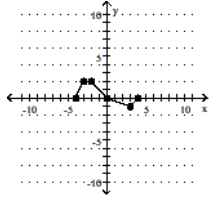


D)

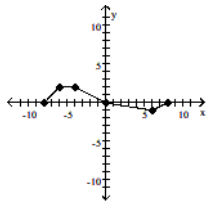


Answer: A

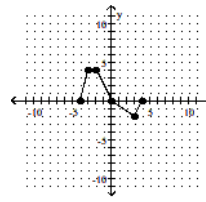
331) $g(x) = f\left(-\frac{1}{2}x\right)$



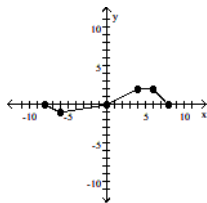
A)



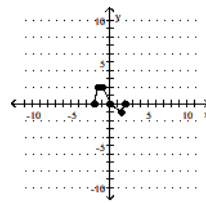
B)



C)

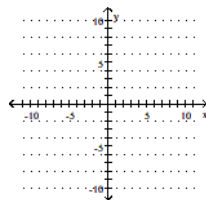
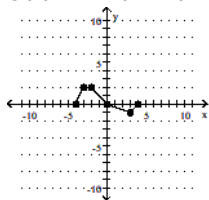


D)

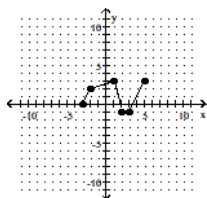


Answer: C

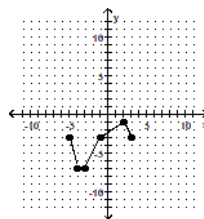
332) $g(x) = -2f(x + 1) - 3$



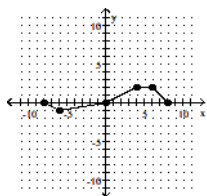
A)



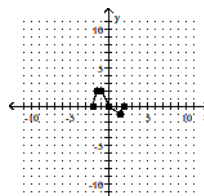
B)



C)

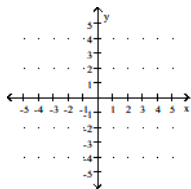
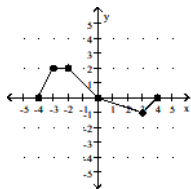


D)

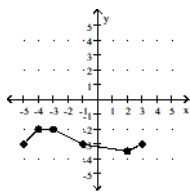


Answer: B

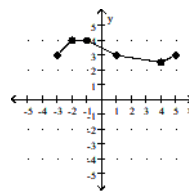
333) $g(x) = \frac{1}{2}f(x - 1) + 3$



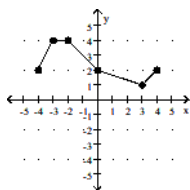
A)



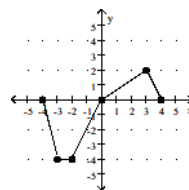
B)



C)



D)



Answer: B

Write the new function.

334) The linear function $f(x) = 233x + 6320$ provides an approximation of the annual cost (in dollars) to rent an apartment at the Leisure Village Retirement Community, where $x = 1$ represents 1973, $x = 2$ represents 1974, and so on. Write a new function, $g(x)$, that yields the same $f(x)$ -values when the exact year number is entered.

A) $g(x) = 233(1972 - x) + 6320$

B) $g(x) = 233(x - 1973) + 6320$

C) $g(x) = 233(x - 1972) + 6320$

D) $g(x) = 233(1973 - x) + 6320$

Answer: C

335) The linear function $f(x) = 73.85x + 1055$ provides an approximation of the value (in dollars) of an account opened on January 1, 1991, in the amount of \$1055 and earning 7% simple interest, where $x = 0$ represents January 1, 1991, $x = 1$ represents January 1, 1992, $x = 2$ represents January 1, 1993, and so on. Write a new function, $g(x)$, that yields the same $f(x)$ -values when the exact year number is entered.

A) $g(x) = 73.85(1992 - x) + 1055$

B) $g(x) = 73.85(x - 1992) + 1055$

C) $g(x) = 73.85(1991 - x) + 1055$

D) $g(x) = 73.85(x - 1991) + 1055$

Answer: D

336) The linear function $f(x) = 443x + 3420$ provides an approximation of the annual cost (in dollars) of health insurance for a family of three, where $x = 1$ represents 1991, $x = 2$ represents 1992, and so on. Write a new function, $g(x)$, that yields the same $f(x)$ -values when the exact year number is entered.

A) $g(x) = 443(1990 - x) + 3420$

B) $g(x) = 443(1991 - x) + 3420$

C) $g(x) = 443(x - 1991) + 3420$

D) $g(x) = 443(x - 1990) + 3420$

Answer: D

Find the given value.

337) Find $(f + g)(-1)$ when $f(x) = x - 4$ and $g(x) = x + 6$.

A) -4

B) -12

C) 0

D) 8

Answer: C

338) Find $(f + g)(2)$ when $f(x) = \frac{9}{\sqrt{x+7}}$ and $g(x) = 5x + 4$.

A) -13

B) 13

C) 17

D) 45

Answer: C

339) Find $(f - g)(2)$ when $f(x) = -2x^2 - 7$ and $g(x) = x + 7$.

A) -24

B) -20

C) 13

D) -10

Answer: A

340) Find $(f - g)(-5)$ when $f(x) = x + 5$ and $g(x) = \sqrt{x - 3}$

A) $\sqrt{8}$

B) 0

C) $\sqrt{3}$

D) Does not exist

Answer: D

341) Find $(f \cdot g)(-5)$ when $f(x) = x + 3$ and $g(x) = 2x^2 + 12x + 2$.

A) -416

B) 16

C) 66

D) 64

Answer: B

342) Find $(f \cdot g)(2)$ when $f(x) = \frac{x}{x^2 - 2x - 15}$ and $g(x) = x + 2$.

A) $-\frac{2}{9}$

B) $-\frac{2}{5}$

C) $-\frac{8}{15}$

D) $-\frac{8}{27}$

Answer: C

343) Find $\left(\frac{f}{g}\right)(-5)$ when $f(x) = 4x - 1$ and $g(x) = 3x^2 + 14x + 2$.

A) -3

B) $\frac{4}{7}$

C) $\frac{3}{19}$

D) $\frac{3}{7}$

Answer: A

344) Find $\left(\frac{f}{g}\right)\left(-\frac{1}{8}\right)$ when $f(x) = x^2 - 1$ and $g(x) = 8x + 1$

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

B) 0

C) $-\frac{2}{3}$

D) Does not exist

Answer: D

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

345) $f(x) = 2 - 9x$; $g(x) = -7x + 9$

Find $f + g$.

A) $(f + g)(x) = -16x + 11$; $(-\infty, \infty)$

B) $(f + g)(x) = -2x + 11$; $\left(-\infty, -\frac{11}{2}\right) \cup \left(-\frac{11}{2}, \infty\right)$

C) $(f + g)(x) = -7x + 2$; $\left(-\infty, \frac{2}{7}\right) \cup \left(\frac{2}{7}, \infty\right)$

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

Answer: A

346) $f(x) = 8x - 8$; $g(x) = 6x - 4$

Find $f - g$.

A) $(f - g)(x) = 2x - 4$; $(-\infty, \infty)$

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

C) $(f - g)(x) = 2x - 12$; $\left(-\infty, 6\right) \cup \left(6, \infty\right)$

D) $(f - g)(x) = 14x - 12$; $\left(-\infty, 1\right) \cup \left(1, \infty\right)$

Answer: A

347) $f(x) = 5x - 7$; $g(x) = 7x + 5$

Find $f \cdot g$.

A) $(f \cdot g)(x) = 35x^2 - 35$; $(-\infty, -35) \cup (-35, \infty)$

B) $(f \cdot g)(x) = 35x^2 - 44x - 35$; $(-\infty, -35) \cup (-35, \infty)$

C) $(f \cdot g)(x) = 12x^2 - 24x - 2$; $(-\infty, \infty)$

D) $(f \cdot g)(x) = 35x^2 - 24x - 35$; $(-\infty, \infty)$

Answer: D

348) $f(x) = 4x + 5$; $g(x) = 4x - 5$

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

A) $\left(\frac{f}{g}\right)(x) = \frac{4x + 5}{4x - 5}$; $\left(-\infty, \frac{5}{4}\right) \cup \left(\frac{5}{4}, \infty\right)$

B) $\left(\frac{f}{g}\right)(x) = \frac{4x - 5}{4x + 5}$; $\left(-\infty, \frac{5}{4}\right) \cup \left(\frac{5}{4}, \infty\right)$

C) $\left(\frac{f}{g}\right)(x) = \frac{4x + 5}{4x - 5}$; $\left(-\infty, -\frac{5}{4}\right) \cup \left(-\frac{5}{4}, \infty\right)$

D) $\left(\frac{f}{g}\right)(x) = \frac{4x - 5}{4x + 5}$; $\left(-\infty, -\frac{5}{4}\right) \cup \left(-\frac{5}{4}, \infty\right)$

Answer: A

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

Find $f + g$.

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

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

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

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

Answer: D

350) $f(x) = x + 3$; $g(x) = 7x^2$

Find $f + g$.

A) $(f + g)(x) = 7x^2 + x + 3$; $(-\infty, \infty)$

B) $(f + g)(x) = 7x^2 + x + 3$; $(-\infty, -3) \cup (-3, \infty)$

C) $(f + g)(x) = -7x^2 + x + 3$; $(-\infty, \infty)$

D) $(f + g)(x) = 7x^2 - x - 3$; $(-\infty, \infty)$

Answer: A

351) $f(x) = 5x^3 + 1$; $g(x) = 2x^2 - 3$

Find $f \cdot g$.

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

C) $(f \cdot g)(x) = 10x^5 - 15x^3 + 2x^2 - 3$; $(-\infty, \infty)$

Answer: C

B) $(f \cdot g)(x) = 10x^6 - 15x^3 + 2x^2 - 3$; $(-\infty, \infty)$

D) $(f \cdot g)(x) = 10x^5 - 15x^3 + 2x^2 - 3$; $(-\infty, 0) \cup (0, \infty)$

352) $f(x) = \sqrt{x}$; $g(x) = 5x - 6$

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

A) $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{x}}{5x-6}$; $\left(-\infty, \frac{6}{5}\right) \cup \left(\frac{6}{5}, \infty\right)$

C) $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{x}}{5x-6}$; $\left[0, \frac{6}{5}\right) \cup \left(\frac{6}{5}, \infty\right)$

Answer: C

B) $\left(\frac{f}{g}\right)(x) = \frac{5x-6}{\sqrt{x}}$; $[0, \infty)$

D) $\left(\frac{f}{g}\right)(x) = \frac{\sqrt{x}}{5x-6}$; $(-\infty, 0) \cup (0, \infty)$

353) $f(x) = \frac{2x+5}{5x-9}$; $g(x) = \frac{5x}{5x-9}$

Find $f - g$.

A) $(f - g)(x) = \frac{-3x+5}{5x-9}$; $\left(-\infty, \frac{9}{5}\right) \cup \left(\frac{9}{5}, \infty\right) \setminus \left\{x \mid x \neq \frac{9}{5}\right\}$

C) $(f - g)(x) = \frac{-3x+5}{5x-9}$; $\left(-\infty, \frac{5}{3}\right) \cup \left(\frac{5}{3}, \infty\right)$

Answer: A

B) $(f - g)(x) = \frac{-3x+5}{5x-9}$; $(-\infty, 0) \cup (0, \infty)$

D) $(f - g)(x) = \frac{7x-5}{5x-9}$; $\left(-\infty, \frac{9}{5}\right) \cup \left(\frac{9}{5}, \infty\right)$

354) $f(x) = \sqrt{x+11}$; $g(x) = \frac{3}{x}$

Find $f \cdot g$.

A) $(f \cdot g)(x) = \frac{\sqrt{3x+33}}{x}$; $[-11, 0) \cup (0, \infty)$

C) $(f \cdot g)(x) = \sqrt{\frac{3x+33}{x}}$; $[0, 11) \cup (11, \infty)$

Answer: B

B) $(f \cdot g)(x) = \frac{3\sqrt{x+11}}{x}$; $[-11, 0) \cup (0, \infty)$

D) $(f \cdot g)(x) = \sqrt{\frac{14}{x}}$; $(-\infty, 0) \cup (0, \infty)$

Evaluate the expression.

355) $(g \circ f)(-8)$ when $f(x) = \frac{x-4}{3}$ and $g(x) = 3x + 3$.

A) 84

B) -24

C) -9

D) $-\frac{25}{3}$

Answer: C

356) $(f \circ g)(-5)$ when $f(x) = 2x - 1$ and $g(x) = 9x^2 + 8x - 1$.

A) 367

B) -173

C) 1000

D) -188

Answer: A

357) $(g \circ f)(-4)$ when $f(x) = -3x + 3$ and $g(x) = -8x^2 + 7x - 7$.

A) 492

B) -22

C) 12

D) -1702

Answer: D

358) $(f \circ g)(a)$ when $f(x) = 3x + 10$ and $g(x) = 3x - 1$.

A) $9a + 29$

B) $9a + 7$

C) $9a + 9$

D) $9a + 13$

Answer: B

359) $(g \circ f)(c)$ when $f(x) = -3x + 4$ and $g(x) = 6x + 4$.

A) $18c + 28$

B) $-18c - 20$

C) $-18c + 16$

D) $-18c + 28$

Answer: D

360) $(f \circ f)(1)$ when $f(x) = 3x + 4$ and $g(x) = 2x^2 + 5$

A) 7

B) 19

C) -7

D) 25

Answer: D

361) $(g \circ g)(6)$ when $f(x) = 3x - 3$ and $g(x) = 3x^2 - 3$

A) 11,022

B) 312

C) 36,966

D) 33,072

Answer: D

Find the composite function for the given functions.

362) $f \circ g$ for $f(x) = 7x + 12$ and $g(x) = 4x - 1$

A) $28x + 19$

B) $28x + 11$

C) $28x + 47$

D) $28x + 5$

Answer: D

363) $f \circ g$ for $f(x) = 3x + 3$ and $g(x) = -6x + 8$

A) $-18x + 26$

B) $18x + 27$

C) $-18x$

D) $-18x + 27$

Answer: D

364) $f \circ g$ for $f(x) = 6x + 7$ and $g(x) = x^2 - 2$

A) $6x^2 - 5$

B) $x^2 - 6x - 9$

C) $36x^2 + 12x - 7$

D) $x^2 + 6x + 5$

Answer: A

365) $f \circ g$ for $f(x) = \frac{7}{4}x$ and $g(x) = -\frac{4}{7}x$

A) 1

B) x

C) $-x$

D) 0

Answer: C

366) $f \circ g$ for $f(x) = \frac{3}{x-2}$ and $g(x) = \frac{4}{3x}$

A) $\frac{4x-8}{9x}$

B) $\frac{9x}{4+6x}$

C) $\frac{9x}{4-6x}$

D) $\frac{3x}{4-6x}$

Answer: C

367) $g \circ f$ for $f(x) = \frac{x-2}{9}$ and $g(x) = 9x+2$

A) x

B) $9x+16$

C) $x - \frac{2}{9}$

D) $x+4$

Answer: A

368) $f \circ g$ for $f(x) = \sqrt{x+10}$ and $g(x) = 8x-14$

A) $2\sqrt{2x-1}$

B) $8\sqrt{x+10}-14$

C) $2\sqrt{2x+1}$

D) $8\sqrt{x-4}$

Answer: A

369) $g \circ f$ for $f(x) = 4x^2+3x+8$ and $g(x) = 3x-4$

A) $4x^2+9x+20$

B) $12x^2+9x+28$

C) $12x^2+9x+20$

D) $4x^2+3x+4$

Answer: C

370) $g \circ f$ for $f(x) = \frac{5}{x}$ and $g(x) = 8x^5$

A) $\frac{8x^5}{5}$

B) $\frac{5}{8x^5}$

C) $\frac{25,000}{x^5}$

D) $\frac{8x^5}{3125}$

Answer: C

371) $g \circ f$ for $f(x) = x^5+2$ and $g(x) = \sqrt[5]{x-2}$

A) $-x$

B) $|x|$

C) x^5

D) x

Answer: D

Find the domain of the composite function $f \circ g$.

372) $f(x) = x^2-49$, $g(x) = 2x+3$

A) $[7, \infty)$

B) $[0, \infty)$

C) $(-\infty, \infty)$

D) $(-7, 7)$

Answer: C

373) $f(x) = \frac{1}{x-9}$, $g(x) = \sqrt{x+6}$

A) $[-6, 9) \cup (9, \infty)$

B) $[0, 75) \cup (75, \infty)$

C) $[0, 9) \cup (9, \infty)$

D) $[-6, 75) \cup (75, \infty)$

Answer: D

374) $f(x) = 5x+50$, $g(x) = x+1$

A) $(-\infty, -10) \cup (-10, -1) \cup (-1, \infty)$

C) $(-\infty, \infty)$

B) $(-\infty, 11) \cup (11, \infty)$

D) $(-\infty, -11) \cup (-11, \infty)$

Answer: C

375) $f(x) = \frac{4}{x+3}$, $g(x) = x+1$

A) $(-\infty, -3) \cup (-3, \infty)$

C) $(-\infty, -3) \cup (-3, -1) \cup (-1, \infty)$

B) $(-\infty, \infty)$

D) $(-\infty, -4) \cup (-4, \infty)$

Answer: D

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

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

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

Answer: C

B) $(-\infty, \infty)$

D) $(-\infty, -5) \cup (-5, -2) \cup (-2, \infty)$

377) $f(x) = \frac{1}{x+10}$, $g(x) = \frac{40}{x}$

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

C) $(-\infty, 0) \cup (0, -4) \cup (-4, \infty)$

Answer: C

B) $(-\infty, -10) \cup (-10, -4) \cup (-4, 0) \cup (0, \infty)$

D) $(-\infty, -10) \cup (-10, 0) \cup (0, \infty)$

378) $f(x) = \sqrt{x}$, $g(x) = 3x + 6$

A) $[0, \infty)$

B) $(-\infty, -2] \cup [0, \infty)$

C) $[-2, \infty)$

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

Answer: C

379) $f(x) = 2x + 10$, $g(x) = \sqrt{x}$

A) $(-\infty, -5] \cup [0, \infty)$

B) $(-\infty, \infty)$

C) $[-5, \infty)$

D) $[0, \infty)$

Answer: D

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

380) $H(x) = \frac{1}{x^2 - 9}$

A) $f(x) = \frac{1}{x^2}$, $g(x) = -\frac{1}{9}$

B) $f(x) = \frac{1}{x^2}$, $g(x) = x - 9$

C) $f(x) = \frac{1}{x}$, $g(x) = x^2 - 9$

D) $f(x) = \frac{1}{9}$, $g(x) = x^2 - 9$

Answer: C

381) $H(x) = |9x + 6|$

A) $f(x) = |x|$, $g(x) = 9x + 6$

C) $f(x) = x$, $g(x) = 9x + 6$

Answer: A

B) $f(x) = |-x|$, $g(x) = 9x - 6$

D) $f(x) = -|x|$, $g(x) = 9x + 6$

382) $H(x) = \frac{1}{x^2} + 5$

A) $f(x) = x$, $g(x) = \frac{1}{x} + 5$

B) $f(x) = \frac{1}{x}$, $g(x) = \frac{1}{x} + 5$

C) $f(x) = \frac{1}{x^2}$, $g(x) = 5$

D) $f(x) = x + 5$, $g(x) = \frac{1}{x^2}$

Answer: D

$$383) H(x) = \frac{9}{\sqrt{5x+10}}$$

$$A) f(x) = \frac{9}{x}, g(x) = 5x + 10$$

$$B) f(x) = \sqrt{5x+10}, g(x) = 9$$

$$C) f(x) = 9, g(x) = \sqrt{5x+10}$$

$$D) f(x) = \frac{9}{\sqrt{x}}, g(x) = 5x + 10$$

Answer: D

$$384) H(x) = (9x + 16)^5$$

$$A) f(x) = x^5, g(x) = 9x + 16$$

$$B) f(x) = 9x^5, g(x) = x + 16$$

$$C) f(x) = 9x + 16, g(x) = x^5$$

$$D) f(x) = (9x)^5, g(x) = 16$$

Answer: A

$$385) H(x) = \sqrt{-27x^2 + 50}$$

$$A) f(x) = \sqrt{-27x + 50}, g(x) = x^2$$

$$B) f(x) = \sqrt{-27x^2}, g(x) = \sqrt{50}$$

$$C) f(x) = \sqrt{x}, g(x) = -27x^2 + 50$$

$$D) f(x) = -27x^2 + 50, g(x) = \sqrt{x}$$

Answer: C

$$386) H(x) = \sqrt{7 - \sqrt{x-7}}$$

$$A) f(x) = \sqrt{x-7}, g(x) = \sqrt{x-7}$$

$$B) f(x) = \sqrt{7+x}, g(x) = \sqrt{x-7}$$

$$C) f(x) = \sqrt{7-x}, g(x) = \sqrt{x-7}$$

$$D) f(x) = \sqrt{x-7}, g(x) = \sqrt{7-x}$$

Answer: C

Solve the problem.

387) Suppose that $P(x)$ represents the percentage of income spent on housing in year x and $I(x)$ represents income in year x . Determine a function H that represents total housing expenditures in year x .

$$A) H(x) = \left(\frac{I}{P}\right)(x)$$

$$B) H(x) = (I - P)(x)$$

$$C) H(x) = (P \cdot I)(x)$$

$$D) H(x) = (P + I)(x)$$

Answer: C

388) A balloon (in the shape of a sphere) is being inflated. The radius is increasing at a rate of 16 cm per second. Find a function, $r(t)$, for the radius in terms of t . Find a function, $V(r)$, for the volume of the balloon in terms of r . Find $(V \circ r)(t)$.

$$A) (V \circ r)(t) = \frac{1792\pi t^3}{3}$$

$$B) (V \circ r)(t) = \frac{16384\pi t^3}{3}$$

$$C) (V \circ r)(t) = \frac{262144\pi\sqrt{t}}{3}$$

$$D) (V \circ r)(t) = \frac{20480\pi t^2}{3}$$

Answer: B

389) At Allied Electronics, production has begun on the X-15 Computer Chip. The total revenue function is given by $R(x) = 41x - 0.3x^2$ and the total cost function is given by $C(x) = 5x + 9$, 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 $P(x)$.

$$A) P(x) = -0.3x^2 + 31x + 9$$

$$B) P(x) = 0.3x^2 + 31x - 27$$

$$C) P(x) = -0.3x^2 + 36x - 9$$

$$D) P(x) = 0.3x^2 + 36x - 18$$

Answer: C

390) At Allied Electronics, production has begun on the X-15 Computer Chip. The total revenue function is given by $R(x) = 55x - 0.3x^2$ and the total profit function is given by $P(x) = -0.3x^2 + 50x - 15$, where x represents the number of boxes of computer chips produced. The total cost function, $C(x)$, is such that $C(x) = R(x) - P(x)$. Find $C(x)$.

A) $C(x) = 7x + 11$

B) $C(x) = -0.3x^2 + 10x + 15$

C) $C(x) = 6x + 20$

D) $C(x) = 5x + 15$

Answer: D

391) At Allied Electronics, production has begun on the X-15 Computer Chip. The total cost function is given by $C(x) = 7x + 9$ and the total profit function is given by $P(x) = -0.3x^2 + 52x - 9$, 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 $R(x)$.

A) $R(x) = 59x - 0.3x^2$

B) $R(x) = 58x - 0.6x^2$

C) $R(x) = 61x - 0.3x^2$

D) $R(x) = 59x + 0.3x^2$

Answer: A

392) A stone is thrown into a pond. A circular ripple is spreading over the pond in such a way that the radius is increasing at the rate of 6.3 feet per second. Find a function, $r(t)$, for the radius in terms of t . Find a function, $A(r)$, for the area of the ripple in terms of r . Find $(A \circ r)(t)$.

A) $(A \circ r)(t) = 12.6\pi t^2$

B) $(A \circ r)(t) = 39.69\pi t^2$

C) $(A \circ r)(t) = 6.3\pi t^2$

D) $(A \circ r)(t) = 39.69\pi t^2$

Answer: D

393) Ken is 6 feet tall and is walking away from a streetlight. The streetlight has its light bulb 14 feet above the ground, and Ken is walking at the rate of 4.2 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) $(S \circ d)(t) = 2.31t$

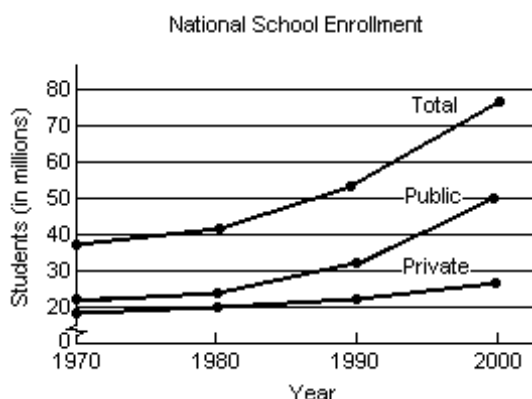
B) $(S \circ d)(t) = 7.1t$

C) $(S \circ d)(t) = 3.15t$

D) $(S \circ d)(t) = 3.99t$

Answer: C

- 394) The following graph shows the private, public and total national school enrollment for students for select years from 1970 through 2000.



- i) How is the graph for total school enrollment, T , determined from the graph of the private enrollment, r , and public enrollment, u ?
- ii) During which 10-year period did the total number of students enrolled increase the least?
- iii) During which 10-year period did the total number of students enrolled increase the most?
- | | |
|---------------------------------------|--|
| A) i) T is the sum of r and u . | B) i) T is the sum of r and u . |
| ii) 1970 - 1980 | ii) 1990 - 2000 |
| iii) 1980 - 1990 | iii) 1970 - 1980 |
| C) i) T is the sum of r and u . | D) i) T is the difference of r and u . |
| ii) 1970 - 1980 | ii) 1970 - 1980 |
| iii) 1990 - 2000 | iii) 1990 - 2000 |

Answer: C

- 395) A firm is considering a new product. The accounting department estimates that the total cost, $C(x)$, of producing will be

$$C(x) = 90x + 7250.$$

The sales department estimates that the revenue, $R(x)$, from selling x units will be

$$R(x) = 100x,$$

but that no more than 935 units can be sold at that price. Find and interpret $(R - C)(935)$.

- | | |
|--|--|
| A) -\$2100 loss, cost exceeds income
It is not worth it to develop product. | B) \$184,900 profit, income exceeds cost
It is worth it to develop product. |
| C) \$1660 profit, income exceeds cost
It is worth it to develop product. | D) \$2100 profit, income exceeds cost
It is worth it to develop product. |

Answer: D

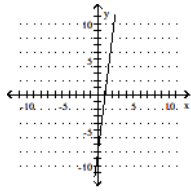
- 396) The function $f(t) = -0.13t^2 + 0.49t + 31.5$ models the U.S. population in millions, ages 65 and older, where t represents years after 1990. The function $g(t) = 0.52t^2 + 12.45t + 107.3$ models the total yearly cost of Medicare in billions of dollars, where t represents years after 1990. What does the function $\frac{g}{f}$ represent? Find $\frac{g}{f}(10)$.

- A) Cost per person in thousands of dollars. \$0.08 thousand
- B) Cost per person in thousands of dollars. \$12.13 thousand
- C) Cost per person in thousands of dollars. \$0.17 thousand
- D) Cost per person in thousands of dollars. \$9.86 thousand

Answer: B

Using the horizontal-line test, determine whether the function is one-to-one.

397)

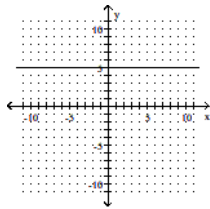


A) one-to-one

B) not one-to-one

Answer: A

398)

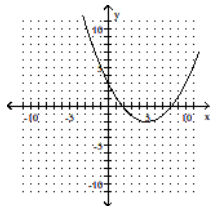


A) one-to-one

B) not one-to-one

Answer: B

399)

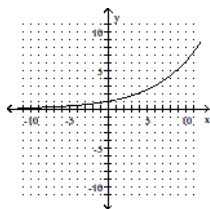


A) one-to-one

B) not one-to-one

Answer: B

400)

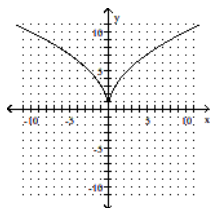


A) one-to-one

B) not one-to-one

Answer: A

401)

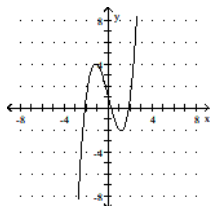


A) one-to-one

B) not one-to-one

Answer: B

402)

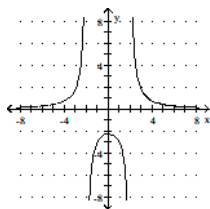


A) one-to-one

B) not one-to-one

Answer: B

403)

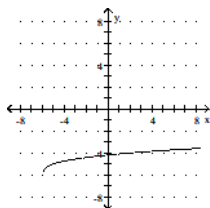


A) one-to-one

B) not one-to-one

Answer: B

404)

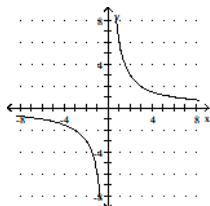


A) one-to-one

B) not one-to-one

Answer: A

405)

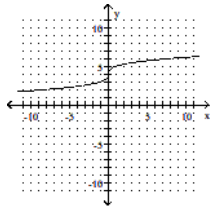


A) one-to-one

B) not one-to-one

Answer: A

406)



A) one-to-one

B) not one-to-one

Answer: A

Assume the functions are one-to-one. Find the requested inverse.

407) If $f(5) = 3$, find $f^{-1}(3)$

A) 5

B) 1

C) 9

D) 3

Answer: A

408) If $g(-4) = 4$, find $g^{-1}(4)$

A) 2

B) 4

C) 7

D) -4

Answer: D

409) Find $(f \circ f^{-1})(6)$

A) 1

B) 4

C) -1

D) 6

Answer: D

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

Show that f and g are inverses of each other by verifying that $f(g(x)) = x = g(f(x))$.

410) $f(x) = 6x$; $g(x) = \frac{x}{6}$

Answer: $f(g(x)) = f\left(\frac{x}{6}\right) = 6 \cdot \frac{x}{6} = x$

$$g(f(x)) = g(6x) = \frac{6x}{6} = x$$

411) $f(x) = \frac{x+8}{4}$; $g(x) = 4x - 8$

Answer: $f(g(x)) = f(4x - 8) = \frac{(4x - 8) + 8}{4} = \frac{4x}{4} = x$

$$g(f(x)) = g\left(\frac{x+8}{4}\right) = 4\left(\frac{x+8}{4}\right) - 8 = (x+8) - 8 = x$$

$$412) f(x) = \sqrt{x}; g(x) = x^2$$

$$\text{Answer: } f(g(x)) = f(x^2) = \sqrt{x^2} = x$$

$$g(f(x)) = g(\sqrt{x}) = (\sqrt{x})^2 = x$$

$$413) f(x) = \sqrt{8 - x}; g(x) = 8 - x^2$$

$$\text{Answer: } f(g(x)) = f(8 - x^2) = \sqrt{8 - (8 - x^2)} = \sqrt{8 - 8 + x^2} = \sqrt{x^2} = x$$

$$g(f(x)) = g(\sqrt{8 - x}) = 8 - (\sqrt{8 - x})^2 = 8 - (8 - x) = 8 - 8 + x = x$$

$$414) f(x) = x^3 - 6; g(x) = \sqrt[3]{x+6}$$

$$\text{Answer: } f(g(x)) = f(\sqrt[3]{x+6}) = (\sqrt[3]{x+6})^3 - 6 = x + 6 - 6 = x$$

$$g(f(x)) = g(x^3 - 6) = \sqrt[3]{(x^3 - 6) + 6} = \sqrt[3]{x^3} = x$$

$$415) f(x) = \sqrt[3]{x+5}; g(x) = x^3 - 5$$

$$\text{Answer: } f(g(x)) = f(x^3 - 5) = \sqrt[3]{(x^3 - 5) + 5} = \sqrt[3]{x^3} = x$$

$$g(f(x)) = g(\sqrt[3]{x+5}) = (\sqrt[3]{x+5})^3 - 5 = x + 5 - 5 = x$$

$$416) f(x) = \frac{7+x}{x}; g(x) = \frac{7}{x-1}$$

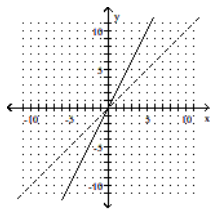
$$\text{Answer: } f(g(x)) = f\left(\frac{7}{x-1}\right) = \frac{7 + \frac{7}{x-1}}{\frac{7}{x-1}} = \frac{\frac{7(x-1)+7}{x-1}}{\frac{7}{x-1}} = \frac{\frac{7x-7+7}{x-1}}{\frac{7}{x-1}} = \frac{7x-7+7}{7} = \frac{7x}{7} = x$$

$$g(f(x)) = g\left(\frac{7+x}{x}\right) = \frac{7}{\frac{7+x}{x} - 1} = \frac{7}{\frac{7+x-x}{x}} = \frac{7}{\frac{7}{x}} = 7 \cdot \frac{x}{7} = x$$

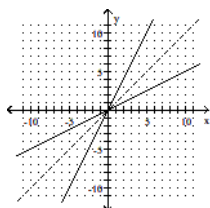
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

The graph of a function f is given. On the same axes, sketch the graph of f^{-1} .

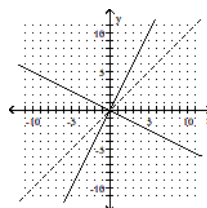
417)



A)

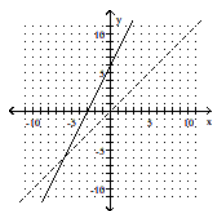


B)

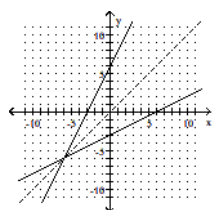


Answer: A

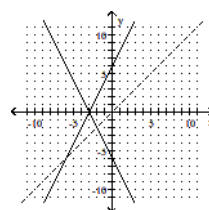
418)



A)

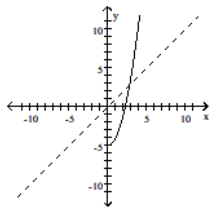


B)

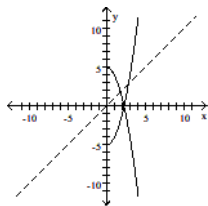


Answer: A

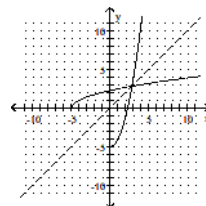
419)



A)

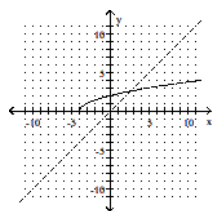


B)

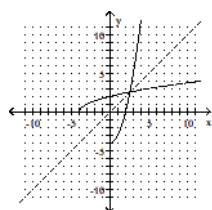


Answer: B

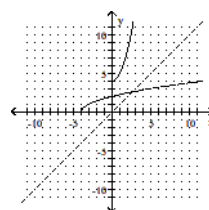
420)



A)

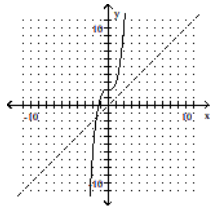


B)

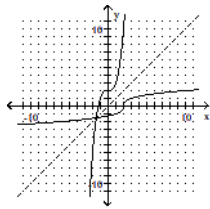


Answer: A

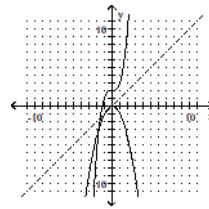
421)



A)

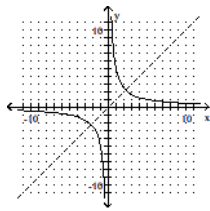


B)

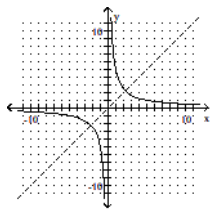


Answer: A

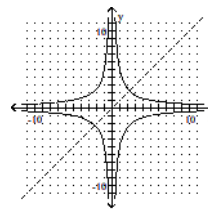
422)



A)

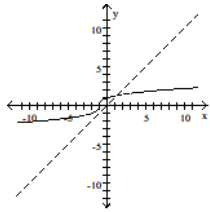


B)

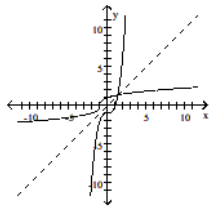


Answer: A

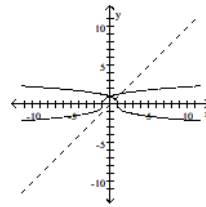
423)



A)

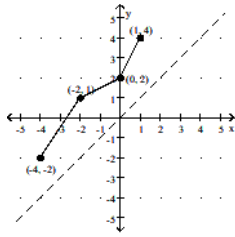


B)

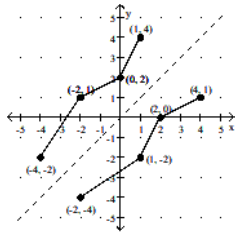


Answer: A

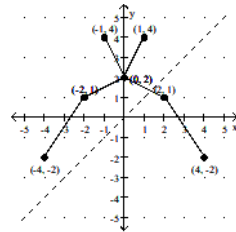
424)



A)



B)



Answer: A

Determine whether the given function is one-to-one. If it is one-to-one, find its inverse.

425) $f(x) = 2 - x$

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

B) $f^{-1}(x) = x + 2$

C) $f^{-1}(x) = 2 - x$

D) $f^{-1}(x) = x - 2$

Answer: C

426) $f(x) = 8x - 48$

A) $f^{-1}(x) = \frac{1}{8}x - 6$

B) $f^{-1}(x) = \frac{1}{6}x + 8$

C) $f^{-1}(x) = \frac{1}{8}x + 6$

D) $f^{-1}(x) = 8x + 48$

Answer: C

427) $f(x) = 2x - 1$

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

B) $f^{-1}(x) = \frac{x - 1}{2}$

C) Not one-to-one

D) $f^{-1}(x) = \frac{x + 1}{2}$

Answer: D

428) $f(x) = -\frac{9}{x}, x \neq 0$

A) $f^{-1}(x) = \frac{9}{x}$

B) $f^{-1}(x) = -\frac{x}{9}$

C) $f^{-1}(x) = -\frac{9}{x}$

D) $f^{-1}(x) = -9x$

Answer: C

429) $f(x) = \frac{9}{x+8}$

A) $f^{-1}(x) = \frac{x}{8+9x}$

B) Not one-to-one

C) $f^{-1}(x) = \frac{8+9x}{x}$

D) $f^{-1}(x) = \frac{-8x+9}{x}$

Answer: D

430) $f(x) = \sqrt{x+9}$

A) $f^{-1}(x) = x^2 - 9, x \geq 0$

B) Not one-to-one

C) $f^{-1}(x) = (x+9)^2$

D) $f^{-1}(x) = \sqrt{x-9}$

Answer: A

431) $f(x) = x\sqrt{3-x^2}$

A) Not one-to-one

B) $f^{-1}(x) = x^2 + 3$

C) $f^{-1}(x) = x^3 - 3$

D) $f^{-1}(x) = x\sqrt{3-x^2}$

Answer: A

432) $f(x) = \sqrt[3]{x} - 7$

A) $f^{-1}(x) = x^3 + 7$

B) $f^{-1}(x) = (x+7)^3$

C) $f^{-1}(x) = (x-7)^3$

D) $f^{-1}(x) = \sqrt[3]{x} + 7$

Answer: B

433) $f(x) = \sqrt[3]{x+3}$

A) $f^{-1}(x) = (x-3)^3$

B) $f^{-1}(x) = \sqrt[3]{x} + 3$

C) $f^{-1}(x) = x^3 - 3$

D) $f^{-1}(x) = (x+3)^3$

Answer: C

434) $f(x) = 2x^2 - 5, x \geq 0$

A) $f^{-1}(x) = \sqrt{\frac{2}{x+5}}$

B) $f^{-1}(x) = \frac{2}{\sqrt{x+5}}$

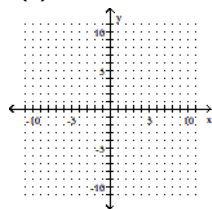
C) Not one-to-one

D) $f^{-1}(x) = \sqrt{\frac{x+5}{2}}$

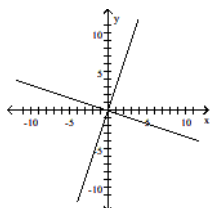
Answer: D

Sketch the graph of the function and its inverse on the same coordinate axes.

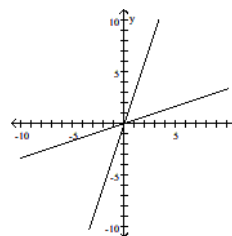
435) $f(x) = 3x$



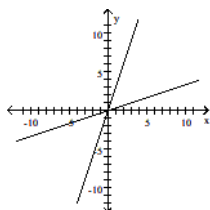
A)



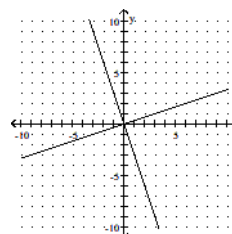
B)



C)

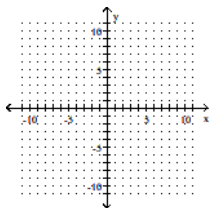


D)

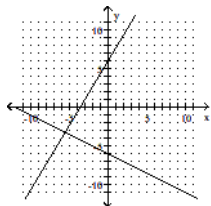


Answer: C

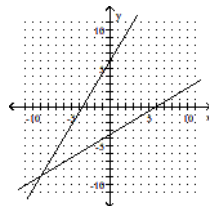
436) $f(x) = \frac{5}{3}x + 6$



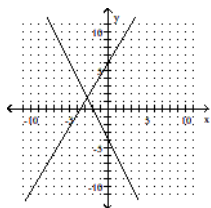
A)



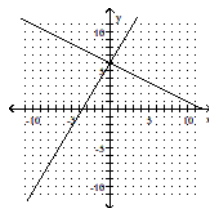
B)



C)

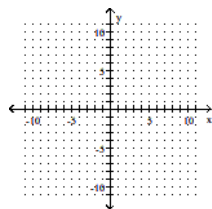


D)

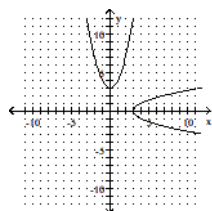


Answer: B

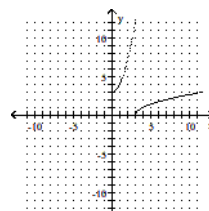
437) $y = \sqrt{x - 3}$



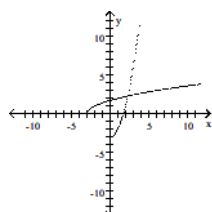
A)



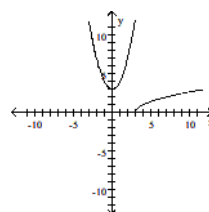
B)



C)

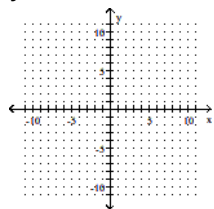


D)

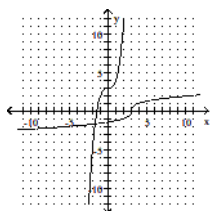


Answer: B

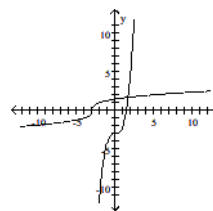
438) $y = x^3 + 3$



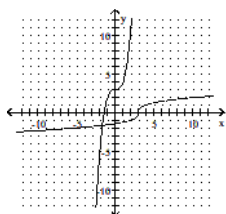
A)



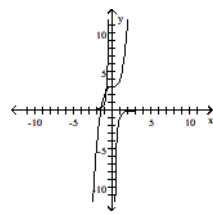
B)



C)

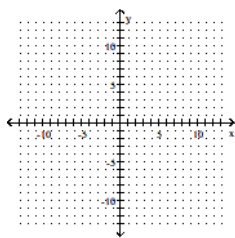


D)

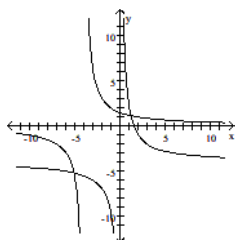


Answer: A

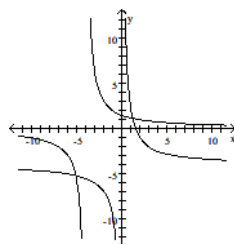
439) $f(x) = \frac{6}{x+4}$



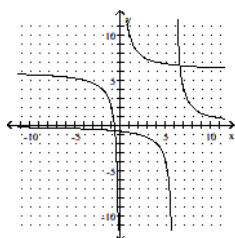
A)



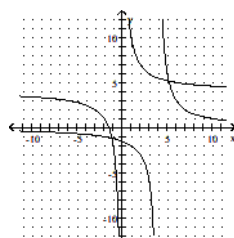
B)



C)

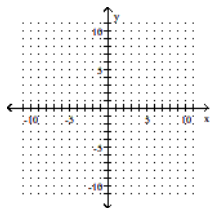


D)

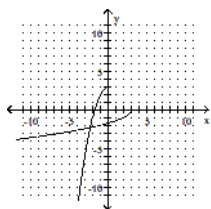


Answer: B

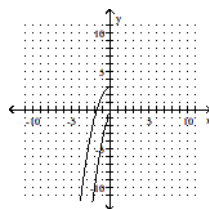
440) $f(x) = 3 - x^2$ for $x \leq 0$



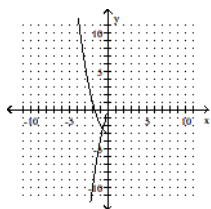
A)



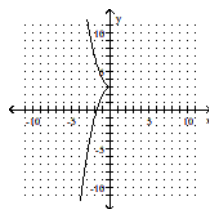
B)



C)

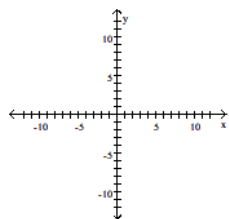


D)

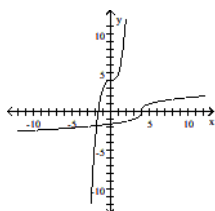


Answer: A

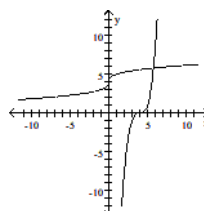
441) $f(x) = (x + 4)^3$



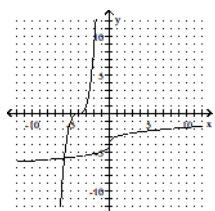
A)



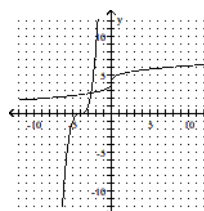
B)



C)



D)



Answer: C

Solve the problem.

442) A size 6 dress in Country C is size 42 in Country D. A function that converts dress sizes in Country C to those in Country D is $f(x) = x + 36$. Find the inverse of the function.

A) $f^{-1}(x) = x - 36$

B) $f^{-1}(x) = \frac{x}{36}$

C) $f^{-1}(x) = \frac{x}{-36}$

D) $f^{-1}(x) = x + 36$

Answer: A

443) A size 60 dress in Country C is size 14 in Country D. A function that converts dress sizes in Country C to those in Country D is $f(x) = \frac{x}{2} - 16$. Find the inverse of the function.

- A) $f^{-1}(x) = 2(x - 16)$ B) $f^{-1}(x) = 2x + 16$ C) $f^{-1}(x) = x + 16$ D) $f^{-1}(x) = 2(x + 16)$

Answer: D

444) A size 6 dress in Country C is size 28 in Country D. A function that converts dress sizes in Country C to those in Country D is $f(x) = 2(x + 8)$. Find the inverse of the function.

- A) $f^{-1}(x) = \frac{x - 8}{2}$ B) $f^{-1}(x) = \frac{x}{2} - 8$ C) $f^{-1}(x) = \frac{x}{2} + 8$ D) $f^{-1}(x) = x - 8$

Answer: B

445) 32° Fahrenheit = 0° Celsius. A function that converts temperatures in Fahrenheit to those in Celsius is $f(x) = \frac{5}{9}(x - 32)$. Find the inverse of the function.

- A) $f^{-1}(x) = \frac{5}{9}(x - 32)$ B) $f^{-1}(x) = \frac{9}{5}x + 32$ C) $f^{-1}(x) = \frac{9}{5}x - 32$ D) $f^{-1}(x) = x + 32$

Answer: B

446) An organization determines that the cost per person of chartering a bus is given by the formula

$$C(x) = \frac{150 + 4x}{x},$$

where x is the number of people in the group and $C(x)$ is in dollars. Find the inverse of the function.

- A) $C^{-1}(x) = \frac{150 + x}{4}$ B) $C^{-1}(x) = \frac{4}{x - 150}$ C) $C^{-1}(x) = \frac{150}{x - 4}$ D) $C^{-1}(x) = \frac{150}{x + 4}$

Answer: C

447) Let $f(x)$ compute the time in hours to travel x miles at 39 miles per hour. What does $f^{-1}(x)$ compute?

- A) The miles traveled in x hours B) The miles traveled in 39 hours
C) The hours taken to travel x miles D) The hours taken to travel 39 miles

Answer: A

448) Let $f(x)$ compute the time in hours to travel x miles at 21 miles per hour. What is the interpretation of $f^{-1}(5)$?

- A) The hours taken to travel 5 miles B) The hours taken to travel 21 miles
C) The miles traveled in 21 hours D) The miles traveled in 5 hours

Answer: D

449) Let $f(x)$ compute the cost of a rental car after x days of use at \$21 per day. What does $f^{-1}(x)$ compute?

- A) The cost of rental for x days B) The cost of rental for 21 days
C) The number of days rented for 21 dollars D) The number of days rented for x dollars

Answer: D

450) Let $f(x)$ compute the cost of a rental car after x days of use at \$46 per day. What is the interpretation of the solution of $f^{-1}(x) = 109$?

- A) The cost of rental for 46 days B) The number of days rented for \$46
C) The number of days rented for \$109 D) The cost of rental for 109 days

Answer: D

451) To remodel a bathroom, a contractor charges \$25 per hour plus material costs, which amount to \$3725. Therefore, the total cost to remodel the bathroom is given by $f(x) = 25x + 3725$ where x is the number of hours the contractor works. Find $f^{-1}(x)$. What does $f^{-1}(x)$ compute?

- A) $f^{-1}(x) = \frac{x}{25} - 3725$; This computes the total cost if the contractor works x hours.
- B) $f^{-1}(x) = \frac{x}{25} - 149$; This computes the number of hours worked if the total cost is x dollars.
- C) $f^{-1}(x) = \frac{x}{25} - 3725$; This computes the number of hours worked if the total cost is x dollars.
- D) $f^{-1}(x) = \frac{x}{25} - 149$; This computes the total cost if the contractor works x hours.

Answer: B