

Determine the average rate of change for the function.

1) $h(x) = -4x + 6$ 1) _____

Solve the problem.

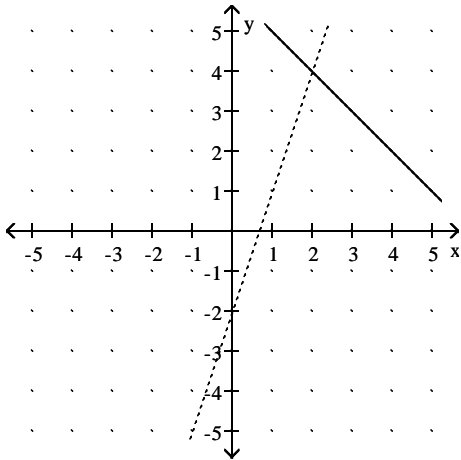
2) Suppose that $f(x) = -x - 3$ and $g(x) = x - 13$. 2) _____

(a) Solve $f(x) = 0$.

(b) Solve $g(x) = 0$.

(c) Solve $f(x) = g(x)$.

3) Let $f(x)$ be the function represented by the dashed line and $g(x)$ be the function represented by the solid line. Solve the equation $f(x) = g(x)$. 3) _____



4) Suppose that $f(x) = -x - 9$ and $g(x) = x - 17$. 4) _____

(a) Solve $f(x) > 0$.

(b) Solve $g(x) > 0$.

(c) Solve $f(x) \leq g(x)$.

5) 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. Express F as a linear function of c . 5) _____

6) 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 . 6) _____

7) The cost for labor associated with fixing a washing machine is computed as follows: There is a fixed charge of \$20 for the repairman to come to the house, to which a charge of \$28 per hour is added. Find an equation that can be used to determine the labor cost, $C(x)$, of a repair that takes x hours. 7) _____

8) 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 \$620 to set up for production, and variable costs of \$47 per jacket. Write an equation that can be used to determine the total cost, $C(x)$, encountered by Marty's Company in producing x jackets. 8) _____

9) A lumber yard has fixed costs of \$5726.40 per day and variable costs of \$0.52 per board-foot produced. Lumber sells for \$2.12 per board-foot. How many board-feet must be produced and sold daily to break even?

9) _____

Plot a scatter diagram.

10)

x	18	-11	12	-15	-1	16	6	22	-6	-6
y	65	15	41	-16	-1	37	7	67	9	5

10) _____

11)

x	12	21	30	46	54	65	69	80	95
y	7	23	36	45	64	50	61	92	85

11) _____

Find the equation of the axis of symmetry of the parabola.

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

12) _____

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

13) _____

14) $f(x) = (x + 5)^2 + 9$

14) _____

15) $f(x) = (x + 7)^2 - 2$

15) _____

16) $f(x) = x^2 - 9$

16) _____

17) $y = x^2 - 8x + 24$

17) _____

18) $y = 3x^2 + 30x + 73$

18) _____

Identify the vertex of the parabola.

19) $f(x) = (x - 6)^2 - 1$

19) _____

20) $y = x^2 + 2$

20) _____

21) $f(x) = -3x^2$

21) _____

22) $f(x) = (x + 7)^2$

22) _____

23) $f(x) = -9(x + 7)^2 + 1$

23) _____

24) $y = 4x^2 - 40x + 96$

24) _____

25) $y = 4x^2 + 8x + 6$

25) _____

Sketch the graph of the parabola.

26) $y = (x + 1)^2 - 6$

26) _____

27) $y = 3(x - 4)^2 - 6$

27) _____

Graph.

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

28) _____

29) $y = x^2 - 2x - 3$

29) _____

Given the equation or other information for a parabola, find the matching description or graph.

30) $f(x) = ax^2 + bx + c,$
 $a < 0; b^2 - 4ac = 0$

30) _____

31) $f(x) = ax^2 + bx + c,$
 $a < 0; b^2 - 4ac < 0$

31) _____

Graph.

32) $y = -3x^2 - 2x - 7$

32) _____

Graph the function using its vertex, axis of symmetry, and intercepts.

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

33) _____

34) $f(x) = -x^2 - 12x$

34) _____

Tell whether a linear model or a quadratic model is appropriate for the data. If linear, tell whether the slope should be positive or negative. If quadratic, decide whether the leading coefficient a of x^2 should be positive or negative.

- 35) The height of a ball thrown from the ground, as a function of time. 35) _____
A) quadratic; positive B) linear; negative
C) quadratic; negative D) linear; positive

- 36) The amount of water in a pool as it is being filled, as a function of time. 36) _____
A) quadratic; positive B) quadratic; negative
C) linear; positive D) linear; negative

Determine the domain and the range of the function.

37) $f(x) = x^2 - 12x$

37) _____

38) $f(x) = x^2 - 2x + 1$ 38) _____

39) $f(x) = -x^2 - 6x - 8$ 39) _____

Determine where the function is increasing and where it is decreasing.

40) $f(x) = x^2 + 10x$ 40) _____

41) $f(x) = x^2 + 6x + 9$ 41) _____

42) $f(x) = -x^2 - 6x - 8$ 42) _____

Determine the quadratic function given.

43) 43) _____

Vertex: (1, 4)

y-intercept: (0, 3)

Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find that value.

44) $f(x) = 4x^2 + 3x - 8$ 44) _____

45) $f(x) = -2x^2 - 4x$ 45) _____

Solve the problem.

46) The manufacturer of a CD player has found that the revenue R (in dollars) is 46) _____
 $R(p) = -5p^2 + 1510p$, when the unit price is p dollars. If the manufacturer sets the price p to maximize revenue, what is the maximum revenue to the nearest whole dollar?

47) The owner of a video store has determined that the cost C , in dollars, of operating the store 47) _____
is approximately given by $C(x) = 2x^2 - 32x + 770$, where x is the number of videos rented daily. Find the lowest cost to the nearest dollar.

48) The price p and the quantity x sold of a certain product obey the demand equation 48) _____
$$p = -\frac{1}{4}x + 140, \quad 0 \leq x \leq 560.$$

What quantity x maximizes revenue? What is the maximum revenue?

49) You have 220 feet of fencing to enclose a rectangular region. Find the dimensions of the 49) _____
rectangle that maximize the enclosed area.

50) A suspension bridge has twin towers that are 1300 feet apart. Each tower extends 180 feet 50) _____
above the road surface. The cables are parabolic in shape and are suspended from the tops of the towers. The cables touch the road surface at the center of the bridge. Find the height of the cable at a point 200 feet from the center of the bridge.

Solve the inequality.

51) $x^2 - 4x - 5 \leq 0$

51) _____

52) $x^2 - 8x \geq 0$

52) _____

53) $x^2 - 49 > 0$

53) _____

54) $x^2 - 64 \leq 0$

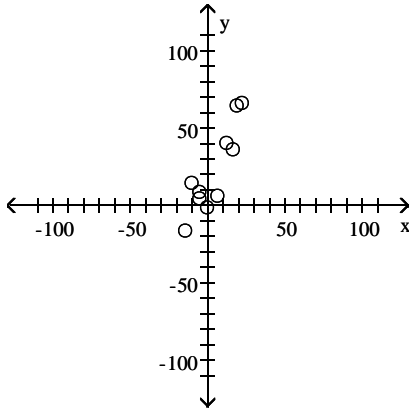
54) _____

55) $4x^2 - 9 < -9x$

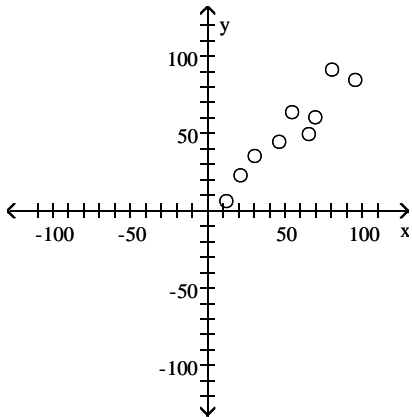
55) _____

Answer Key
 Testname: PP4

- 1) -4
- 2) (a) $x = -3$; (b) $x = 13$; (c) $x = 5$
- 3) $x = 2$
- 4) (a) $x < -9$; (b) $x > 17$; (c) $x \geq 4$
- 5) $F(c) = 1.8c + 32$
- 6) $V(t) = 32t + 10$
- 7) $C(x) = 20 + 28x$
- 8) $C(x) = 620 + 47x$
- 9) 3579 board-feet
- 10)

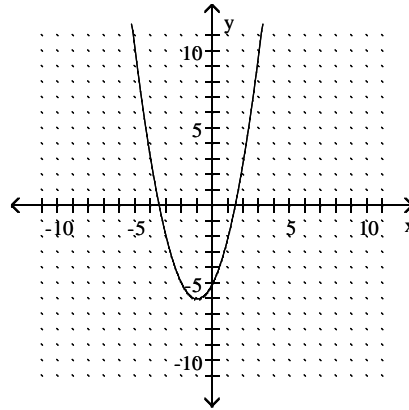


11)

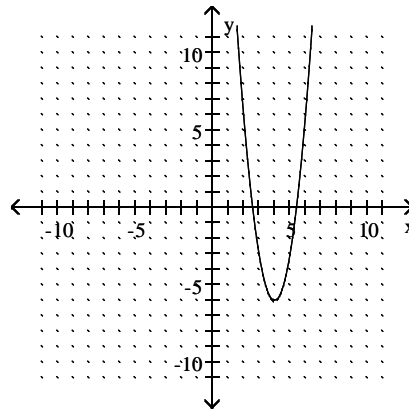


- 12) $x = 3$
- 13) $x = 0$
- 14) $x = -5$
- 15) $x = -7$
- 16) $x = 0$
- 17) $x = 4$
- 18) $x = -5$
- 19) $(6, -1)$
- 20) $(0, 2)$
- 21) $(0, 0)$
- 22) $(-7, 0)$
- 23) $(-7, 1)$
- 24) $(5, -4)$
- 25) $(-1, 2)$

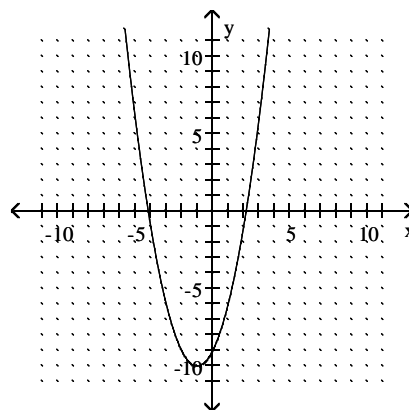
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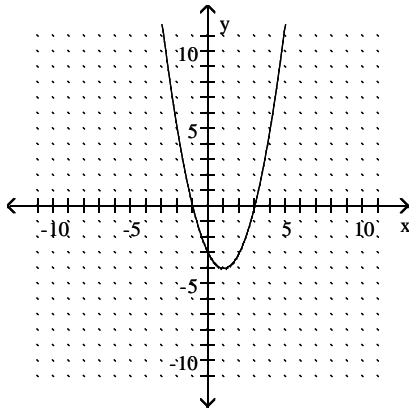


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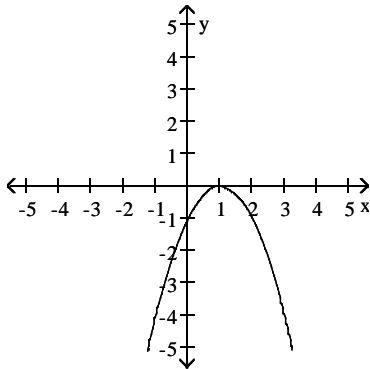


Answer Key
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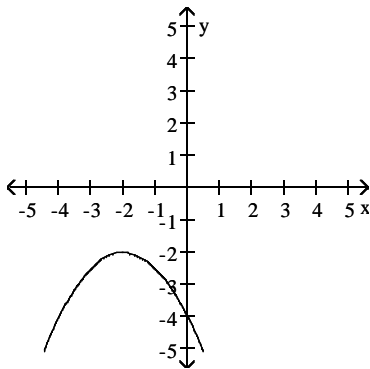
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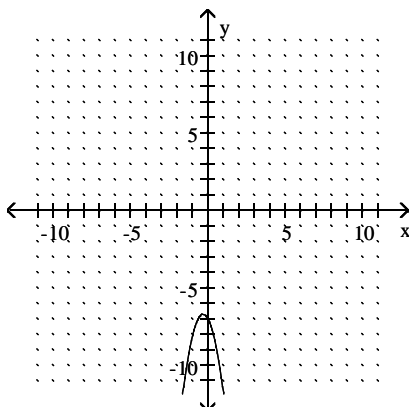
30)



31)

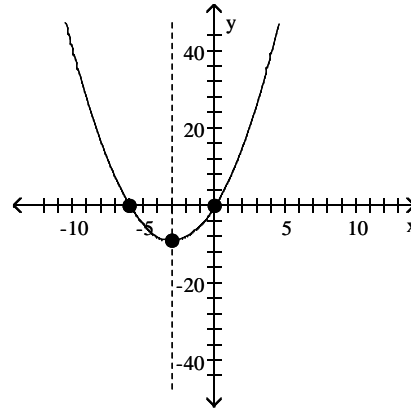


32)



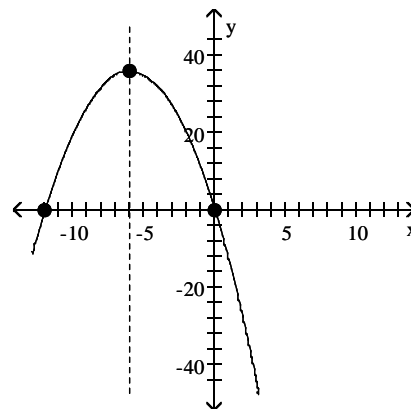
33) vertex $(-3, -9)$

intercepts $(0, 0), (-6, 0)$



34) vertex $(-6, 36)$

intercepts $(0, 0), (-12, 0)$



35) C

36) C

37) domain: all real numbers
range: $\{y \mid y \geq -36\}$

38) domain: all real numbers
range: $\{y \mid y \geq 0\}$

39) domain: all real numbers
range: $\{y \mid y \leq 1\}$

40) increasing on $(-5, \infty)$
decreasing on $(-\infty, -5)$

41) increasing on $(-3, \infty)$
decreasing on $(-\infty, -3)$

42) increasing on $(-\infty, -3)$
decreasing on $(-3, \infty)$

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

44) minimum; $-\frac{137}{16}$

45) maximum; 2

46) \$114,005

47) \$642

48) 280; \$19,600

49) 55 ft by 55 ft

Answer Key

Testname: PP4

50) The height is approximately 17 ft.

51) $[-1, 5]$

52) $(-\infty, 0]$ or $[8, \infty)$

53) $(-\infty, -7)$ or $(7, \infty)$

54) $[-8, 8]$

55) $\left\{-3, \frac{3}{4}\right\}$