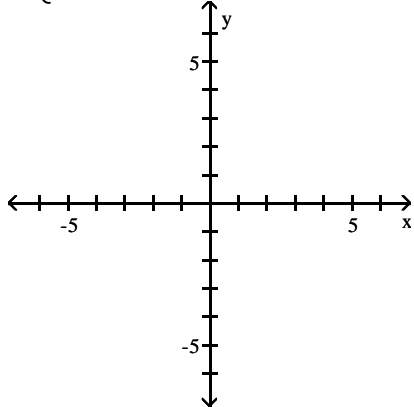


Name _____

Graph the function.

1)

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



1) _____

Objective: (2.4) Graph Piecewise-defined Functions

Solve the problem.

2) An electric company has the following rate schedule for electricity usage in single-family residences: 2) _____

Monthly service charge	\$4.93
Per kilowatt service charge	
1st 300 kilowatts	\$0.11589/kW
Over 300 kilowatts	\$0.13321/kW

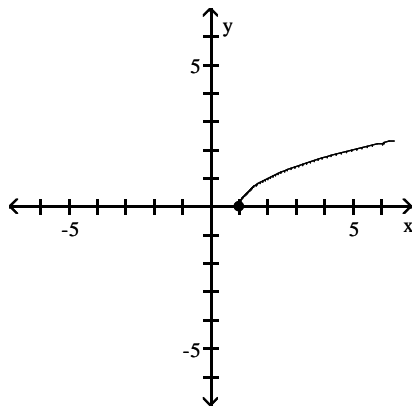
What is the charge for using 300 kilowatts in one month?
What is the charge for using 375 kilowatts in one month?
Construct a function that gives the monthly charge C for x kilowatts of electricity.

Objective: (2.4) Graph Piecewise-defined Functions

Match the correct function to the graph.

3)

3) _____



A) $y = \sqrt{x}$

B) $y = x - 1$

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

D) $y = \sqrt{x - 1}$

Objective: (2.5) Graph Functions Using Vertical and Horizontal Shifts

Write the equation of a sine function that has the given characteristics.

4) The graph of $y = x^2$, shifted 6 units upward

4) _____

Objective: (2.5) Graph Functions Using Vertical and Horizontal Shifts

5) The graph of $y = \sqrt{x}$, shifted 9 units to the left

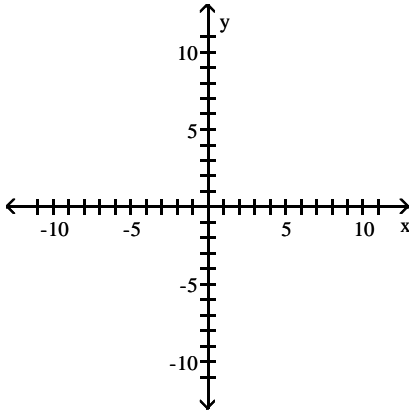
5) _____

Objective: (2.5) Graph Functions Using Vertical and Horizontal Shifts

Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.

6) $f(x) = (x - 3)^2 - 4$

6) _____



Objective: (2.5) Graph Functions Using Vertical and Horizontal Shifts

Write the equation that results in the desired transformation.

7) The graph of $y = x^3$, vertically compressed by a factor of 0.7

7) _____

Objective: (2.5) Graph Functions Using Compressions and Stretches

Suppose the point (2, 4) is on the graph of $y = f(x)$. Find a point on the graph of the given function.

8) $y = 4f(x)$

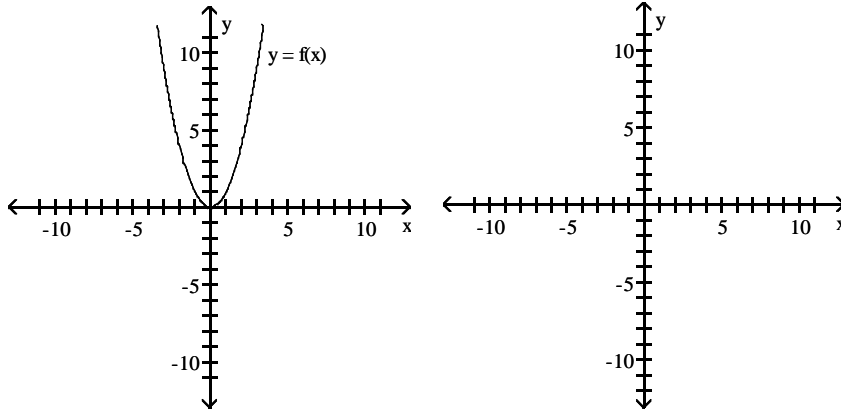
8) _____

Objective: (2.5) Graph Functions Using Compressions and Stretches

Use the accompanying graph of $y = f(x)$ to sketch the graph of the indicated equation.

9) $y = -2f(x + 5) + 4$

9) _____

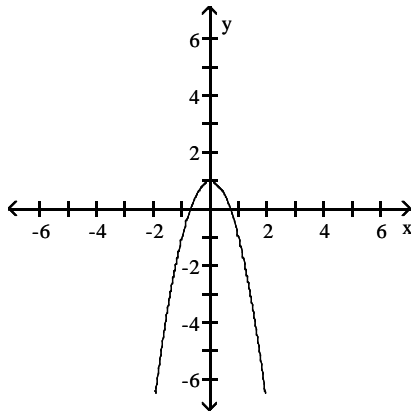


Objective: (2.5) Graph Functions Using Compressions and Stretches

Match the correct function to the graph.

10)

10) _____



A) $y = -2x^2 - 1$

B) $y = 1 - x^2$

C) $y = -2x^2 + 1$

D) $y = -2x^2$

Objective: (2.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

Find the function.

11) Find the function that is finally graphed after the following transformations are applied to the graph of $y = |x|$. The graph is shifted right 3 units, stretched by a factor of 3, shifted vertically down 2 units, and finally reflected across the x-axis.

11) _____

Objective: (2.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

- 12) Find the function that is finally graphed after the following transformations are applied to the graph of $y = \sqrt{x}$. The graph is shifted up 2 units, reflected about the y -axis, and finally shifted right 8 units. 12) _____
- Objective: (2.5) Graph Functions Using Reflections about the x -Axis and the y -Axis

Solve the problem.

- 13) Elissa wants to set up a rectangular dog run in her backyard. She has 34 feet of fencing to work with and wants to use it all. If the dog run is to be x feet long, express the area of the dog run as a function of x . 13) _____
- Objective: (2.6) Build and Analyze Functions

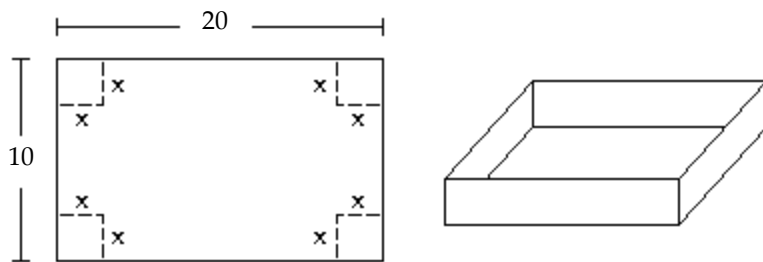
- 14) A farmer has 1000 yards of fencing to enclose a rectangular garden. Express the area A of the rectangle as a function of the width x of the rectangle. What is the domain of A ? 14) _____
- Objective: (2.6) Build and Analyze Functions

- 15) A farmer's silo is the shape of a cylinder with a hemisphere as the roof. If the height of the silo is 78 feet and the radius of the hemisphere is r feet, express the volume of the silo as a function of r . 15) _____
- Objective: (2.6) Build and Analyze Functions

- 16) The volume V of a square-based pyramid with base sides s and height h is $V = \frac{1}{3}s^2h$. If the height is half of the length of a base side, express the volume V as a function of s . 16) _____
- Objective: (2.6) Build and Analyze Functions

- 17) A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 10 inches by 20 inches by cutting out equal squares of side x at each corner and then folding up the sides as in the figure. Express the volume V of the box as a function of x .

17) _____

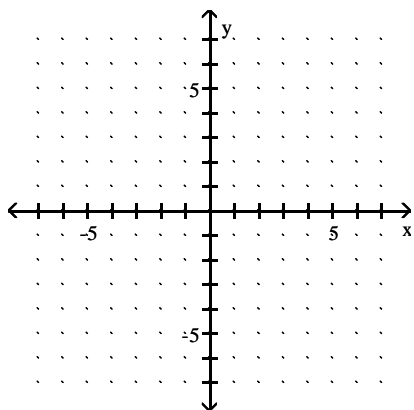


Objective: (2.6) Build and Analyze Functions

Use the slope and y -intercept to graph the linear function.

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

18) _____

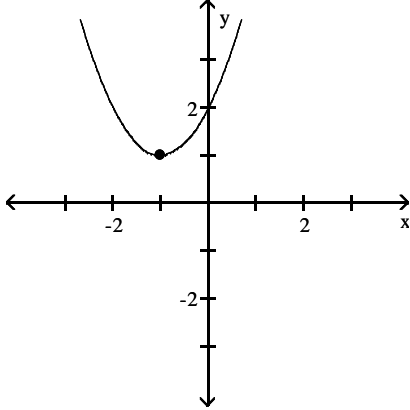


Objective: (3.1) Graph Linear Functions

Match the graph to one of the listed functions.

19)

19) _____



A) $f(x) = x^2 + 2x + 2$

B) $f(x) = x^2 - 2x + 1$

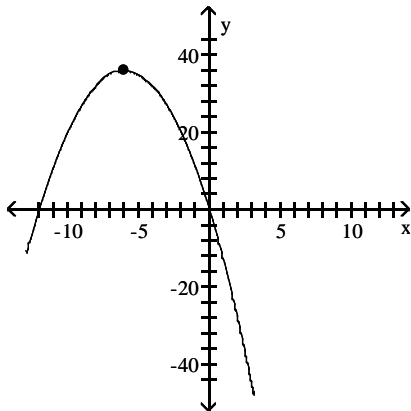
C) $f(x) = x^2 + 2x + 1$

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

Objective: (3.3) Graph a Quadratic Function Using Transformations

20)

20) _____



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

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

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

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

Objective: (3.3) Graph a Quadratic Function Using Transformations

Find the vertex and axis of symmetry of the graph of the function.

21) $f(x) = x^2 + 10x$

21) _____

Objective: (3.3) Identify the Vertex and Axis of Symmetry of a Quadratic Function

22) $f(x) = -11x^2 - 2x - 4$

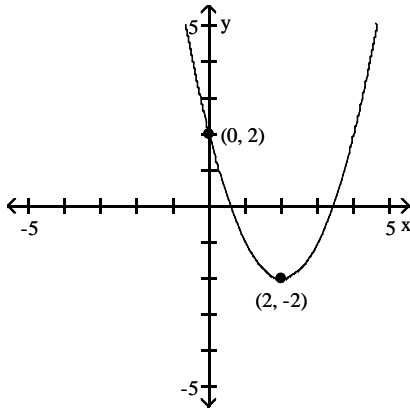
22) _____

Objective: (3.3) Identify the Vertex and Axis of Symmetry of a Quadratic Function

Determine the quadratic function whose graph is given.

23)

23) _____



Objective: (3.3) Find a Quadratic Function Given Its Vertex and One Other Point

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

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

24) _____

Objective: (3.3) Find the Maximum or Minimum Value of a Quadratic Function

25) $f(x) = -5x^2 - 2x - 4$

25) _____

Objective: (3.3) Find the Maximum or Minimum Value of a Quadratic Function

Solve the problem.

26) The manufacturer of a CD player has found that the revenue R (in dollars) is

26) _____

$R(p) = -5p^2 + 1510p$, 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?

Objective: (3.3) Find the Maximum or Minimum Value of a Quadratic Function

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

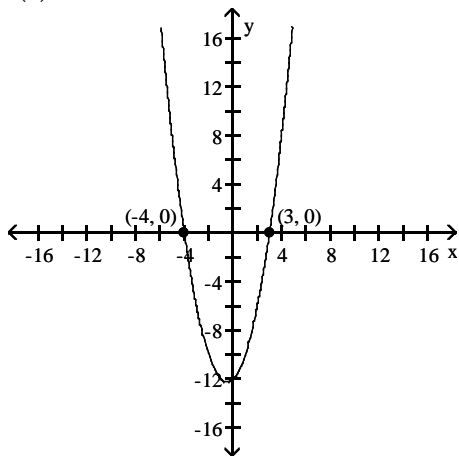
27) _____

Objective: (3.3) Find the Maximum or Minimum Value of a Quadratic Function

Use the figure to solve the inequality.

28) $f(x) < 0$

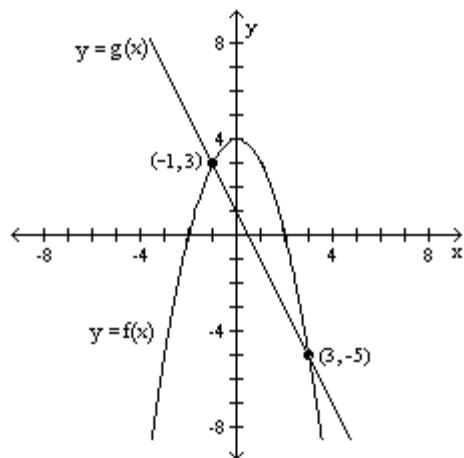
28) _____



Objective: (3.5) Solve Inequalities Involving a Quadratic Function

29)

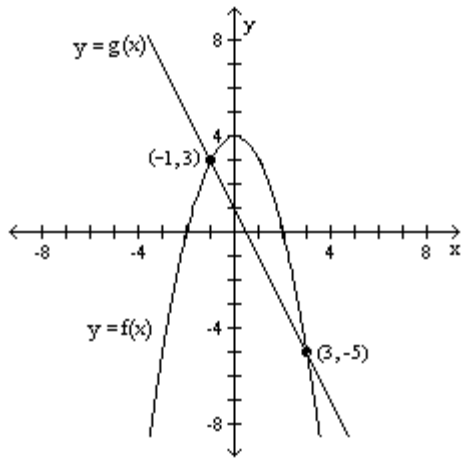
29) _____



$f(x) < g(x)$

Objective: (3.5) Solve Inequalities Involving a Quadratic Function

30)



$$f(x) \geq g(x)$$

Objective: (3.5) Solve Inequalities Involving a Quadratic Function

30) _____

Solve the inequality.

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

Objective: (3.5) Solve Inequalities Involving a Quadratic Function

31) _____

32) $x^2 + 6x + 8 > 0$

Objective: (3.5) Solve Inequalities Involving a Quadratic Function

32) _____

Solve the problem.

33) If $f(x) = 6x^2 - 5x$ and $g(x) = 2x + 3$, solve for $f(x) = g(x)$

Objective: (3.5) Solve Inequalities Involving a Quadratic Function

33) _____

34) If $f(x) = 6x^2 - 5x$ and $g(x) = 2x + 3$, solve $f(x) \leq g(x)$.

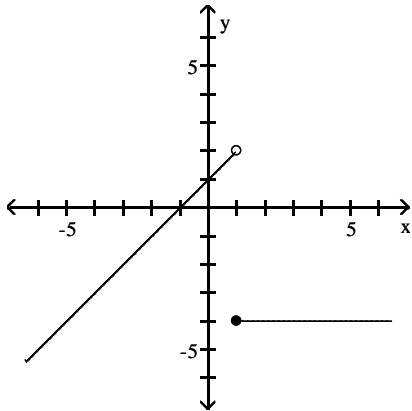
Objective: (3.5) Solve Inequalities Involving a Quadratic Function

34) _____

Answer Key

Testname: 13SPR_CH1-3_MATH2_HW_2

1)



2) \$39.70

\$49.69

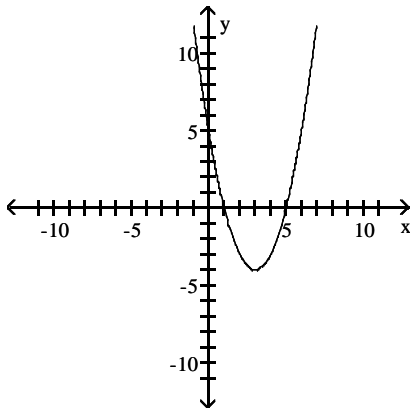
$$C(x) = \begin{cases} 4.93 + 0.11589x & \text{if } 0 \leq x \leq 300 \\ -0.266 + 0.13321x & \text{if } x > 300 \end{cases}$$

3) D

4) $y = x^2 + 6$

5) $y = \sqrt{x+9}$

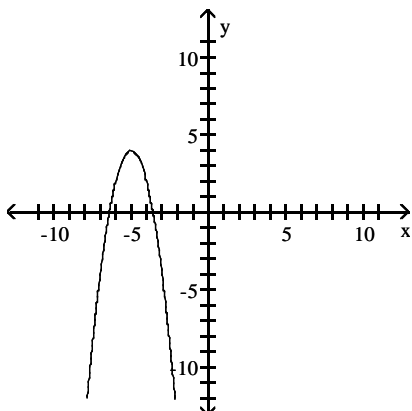
6)



7) $y = 0.7x^3$

8) (2, 16)

9)



10) C

Answer Key

Testname: 13SPR_CH1-3_MATH2_HW_2

11) $y = -(3|x - 3| - 2)$

12) $y = \sqrt{-x + 8} + 2$

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

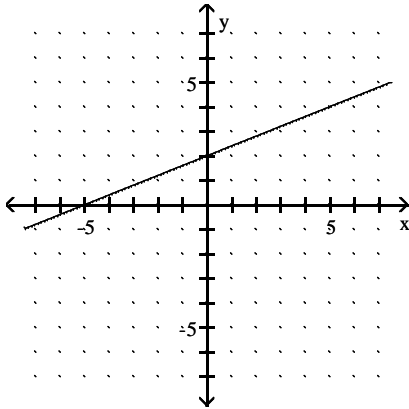
14) $A(x) = -x^2 + 500x; \{x | 0 < x < 500\}$

15) $V(r) = \pi(78 - r)r^2 + \frac{2}{3} \pi r^3$

16) $V(s) = \frac{1}{6}s^3$

17) $V(x) = x(10 - 2x)(20 - 2x)$

18)



19) A

20) A

21) $(-5, -25); x = -5$

22) $\left(-\frac{1}{11}, -\frac{43}{11}\right); x = -\frac{1}{11}$

23) $f(x) = x^2 - 4x + 2$

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

25) maximum; $-\frac{19}{5}$

26) \$114,005

27) 55 ft by 55 ft

28) $\{x | -4 < x < 3\}; (-4, 3)$

29) $\{x | x < -1 \text{ or } x > 3\}; (-\infty, -1) \text{ or } (3, \infty)$

30) $\{x | -1 \leq x \leq 3\}; [-1, 3]$

31) $[-1, 5]$

32) $(-\infty, -4) \text{ or } (-2, \infty)$

33) $x = \frac{3}{2}, x = -\frac{1}{3}$

34) $\left[-\frac{1}{3}, \frac{3}{2}\right]$