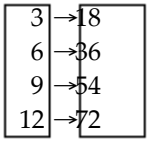
Test Bank for Precalculus 5th Sullivan

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

Determine whether the relation represents a function. If it is a function, state the domain and range.

1)



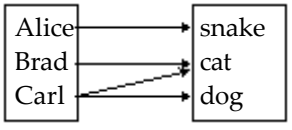
A) function
domain: {3, 6, 9, 12}
range: {18, 36, 54, 72}

B) function
domain:{18, 36, 54, 72}
range: {3, 6, 9, 12}

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

2)



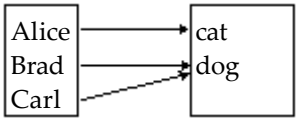
A) function
domain: {snake, cat, dog}
range: {Alice, Brad, Carl}

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

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

3)



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

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

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

4) {(−3, −6), (1, 3), (3, 2), (6, −2)}

A) function
domain: {−3, 1, 3, 6}
range: {−6, 3, 2, −2}

B) function
domain: {−6, 3, 2, −2}
range: {−3, 1, 3, 6}

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

5) {(11, −3), (2, −2), (2, 0), (6, 2), (18, 4)}

A) function
domain: {11, 6, 2, 18}
range: {−3, −2, 0, 2, 4}

B) function
domain: {−3, −2, 0, 2, 4}
range: {11, 6, 2, 18}

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

6) {(−2, 5), (−1, 2), (0, 1), (1, 2), (3, 10)}

A) function
domain: {−2, −1, 0, 1, 3}
range: {5, 2, 1, 10}

B) function
domain: {5, 2, 1, 10}
range: {−2, −1, 0, 1, 3}

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

7) {(4.88, 5.48), (4.888, −5.5), $(\frac{7}{3}, 0)$, (2.33, −4)}

A) function
domain: {4.88, 4.888, $\frac{7}{3}$, 2.33}
range: {5.48, −5.5, 0, −4}

B) function
domain: {5.48, −5.5, 0, −4}
range: {4.88, 4.888, $\frac{7}{3}$, 2.33}

C) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

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

8) $y = x^3$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

9) $y = \frac{1}{x}$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

10) $y = |x|$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

11) $y^2 = 5 - x^2$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

12) $y = \pm\sqrt{1 - 6x}$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

13) $x = y^2$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

14) $y^2 + x = 4$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

15) $y = 5x^2 - 7x + 7$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

16) $y = \frac{4x - 1}{x + 2}$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

17) $x^2 - 4y^2 = 1$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

18) $x + 2y = 6$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

19) $-9x + x^2 - 85 = y$

A) function B) not a function

Objective: (1.1) Determine Whether a Relation Represents a Function

Find the value for the function.

20) Find f(−4) when $f(x) = x^2 - 4x + 7$.

A) 25 B) −7 C) 39 D) 7

Objective: (1.1) Find the Value of a Function

21) Find f(2) when $f(x) = \frac{x^2 - 8}{x + 3}$.

A) 6 B) $\frac{12}{5}$ C) $-\frac{4}{5}$ D) $\frac{4}{5}$

Objective: (1.1) Find the Value of a Function

22) Find f(−9) when $f(x) = |x| - 6$.

A) 3 B) −3 C) −15 D) 15

Objective: (1.1) Find the Value of a Function

23) Find f(5) when $f(x) = \sqrt{x^2 + 2x}$.

A) $3\sqrt{3}$ B) $\sqrt{29}$ C) $\sqrt{6}$ D) $\sqrt{35}$

Objective: (1.1) Find the Value of a Function

24) Find f(−x) when $f(x) = 3x^2 + 5x + 3$.

A) $3x^2 - 5x + 3$ B) $3x^2 - 5x - 3$ C) $-3x^2 - 5x - 3$ D) $-3x^2 - 5x + 3$

Objective: (1.1) Find the Value of a Function

25) Find f(−x) when $f(x) = \frac{x}{x^2 + 5}$.

A) $\frac{-x}{x^2 - 5}$ B) $\frac{x}{-x^2 + 5}$ C) $\frac{-x}{-x^2 + 5}$ D) $\frac{-x}{x^2 + 5}$

Objective: (1.1) Find the Value of a Function

26) Find $-f(x)$ when $f(x) = -2x^2 - 3x + 2$.

A) $2x^2 + 3x - 2$ B) $-2x^2 + 3x - 2$ C) $2x^2 + 3x + 2$ D) $-2x^2 + 3x + 2$

Objective: (1.1) Find the Value of a Function

27) Find $-f(x)$ when $f(x) = |x| + 4$.

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

Objective: (1.1) Find the Value of a Function

28) Find $f(x - 1)$ when $f(x) = 2x^2 - 4x - 7$.

A) $-8x^2 + 2x - 1$ B) $2x^2 - 18x - 9$ C) $2x^2 - 8x - 1$ D) $2x^2 - 8x - 9$

Objective: (1.1) Find the Value of a Function

29) Find $f(x + 1)$ when $f(x) = \dfrac{x^2 - 4}{x + 4}$.

A) $\dfrac{x^2 + 2x - 3}{x + 5}$ B) $\dfrac{x^2 - 3}{x + 5}$ C) $\dfrac{x^2 + 2x - 3}{x - 3}$ D) $\dfrac{x^2 + 2x + 5}{x + 5}$

Objective: (1.1) Find the Value of a Function

30) Find $f(-x)$ when $f(x) = 3x^2 + 2x + 1$.

A) $-3x^2 - 2x + 1$ B) $3x^2 - 2x + 1$ C) $-3x^2 - 2x - 1$ D) $3x^2 - 2x - 1$

Objective: (1.1) Find the Value of a Function

31) Find $f(2x)$ when $f(x) = \sqrt{8x^2 - 5x}$.

A) $\sqrt{16x^2 - 20x}$ B) $2\sqrt{8x^2 - 5x}$ C) $\sqrt{32x^2 - 10x}$ D) $\sqrt{16x^2 - 10x}$

Objective: (1.1) Find the Value of a Function

32) Find $f(x + h)$ when $f(x) = -2x^2 - 3x + 1$.

A) $-2x^2 - 4xh - 2h^2 - 3x - 3h + 1$ B) $-2x^2 - 2xh - 2h^2 - 3x - 3h + 1$

C) $-2x^2 - 2h^2 - 3x - 3h + 1$ D) $-2x^2 - 2h^2 - 7x - 7h + 1$

Objective: (1.1) Find the Value of a Function

33) Find $f(x + h)$ when $f(x) = \dfrac{9x + 4}{8x + 3}$.

A) $\dfrac{9x + 9h + 4}{8x + 3}$ B) $\dfrac{9x + 13h}{8x + 11h}$ C) $\dfrac{9x + 4h}{8x + 3h}$ D) $\dfrac{9x + 9h + 4}{8x + 8h + 3}$

Objective: (1.1) Find the Value of a Function

Solve the problem.

34) If $f(x) = 7x^3 + 4x^2 - x + C$ and $f(3) = 1$, what is the value of C?

A) $C = 229$ B) $C = -221$ C) $C = 157$ D) $C = -29$

Objective: (1.1) Find the Value of a Function

35) If $f(x) = \frac{x - B}{x - A}$, $f(-9) = 0$, and $f(2)$ is undefined, what are the values of A and B?

A) $A = -2, B = 9$ B) $A = 9, B = -2$ C) $A = -9, B = 2$ D) $A = 2, B = -9$

Objective: (1.1) Find the Value of a Function

36) If $f(x) = \frac{x - 4A}{8x + 5}$ and $f(8) = -4$, what is the value of A?

A) $A = -71$ B) $A = -67$ C) $A = 67$ D) $A = 71$

Objective: (1.1) Find the Value of a Function

37) If a rock falls from a height of 80 meters on Earth, the height H (in meters) after x seconds is approximately $H(x) = 80 - 4.9x^2$.

What is the height of the rock when x = 1.2 seconds? Round to the nearest hundredth, if necessary.

A) 74.12 m B) 87.06 m C) 73.09 m D) 72.94 m

Objective: (1.1) Find the Value of a Function

38) If a rock falls from a height of 50 meters on Earth, the height H (in meters) after x seconds is approximately $H(x) = 50 - 4.9x^2$.

When does the rock strike the ground? Round to the nearest hundredth, if necessary.

A) 10.2 sec B) 1.44 sec C) 2.08 sec D) 3.19 sec

Objective: (1.1) Find the Value of a Function

Find the domain of the function.

39) $f(x) = 5x + 7$

A) $\{x \mid x \geq -7\}$ B) $\{x \mid x \neq 0\}$ C) $\{x \mid x > 0\}$ D) all real numbers

Objective: (1.1) Find the Domain of a Function Defined by an Equation

40) $f(x) = x^2 + 9$

A) all real numbers B) $\{x \mid x > -9\}$ C) $\{x \mid x \geq -9\}$ D) $\{x \mid x \neq -9\}$

Objective: (1.1) Find the Domain of a Function Defined by an Equation

41) $f(x) = \frac{x^2}{x^2 + 13}$

A) $\{x \mid x > -13\}$ B) $\{x \mid x \neq -13\}$ C) all real numbers D) $\{x \mid x \neq 0\}$

Objective: (1.1) Find the Domain of a Function Defined by an Equation

42) $g(x) = \frac{3x}{x^2 - 81}$

A) $\{x \mid x \neq 0\}$ B) $\{x \mid x > 81\}$ C) $\{x \mid x \neq -9, 9\}$ D) all real numbers

Objective: (1.1) Find the Domain of a Function Defined by an Equation

43) $h(x) = \frac{x - 1}{x^3 - 4x}$

A) $\{x \mid x \neq -2, 0, 2\}$ B) $\{x \mid x \neq 0\}$ C) all real numbers D) $\{x \mid x \neq 1\}$

Objective: (1.1) Find the Domain of a Function Defined by an Equation

44) $f(x) = \sqrt{11 - x}$

A) $\{x \mid x \le 11\}$ B) $\{x \mid x \le \sqrt{11}\}$ C) $\{x \mid x \ne 11\}$ D) $\{x \mid x \ne \sqrt{11}\}$

Objective: (1.1) Find the Domain of a Function Defined by an Equation

45) $\dfrac{x}{\sqrt{x - 9}}$

A) $\{x \mid x \ne 9\}$ B) $\{x \mid x \ge 9\}$ C) $\{x \mid x > 9\}$ D) all real numbers

Objective: (1.1) Find the Domain of a Function Defined by an Equation

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

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

Find $f + g$.

A) $(f + g)(x) = -2x + 10$; $\{x \mid x \ne -5\}$ B) $(f + g)(x) = -5x + 3$; $\{x \mid x \ne \frac{3}{5}\}$

C) $(f + g)(x) = -12x + 10$; all real numbers D) $(f + g)(x) = -2x$; all real numbers

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

47) $f(x) = 9x - 3$; $g(x) = 3x - 2$

Find $f - g$.

A) $(f - g)(x) = 6x - 5$; $\{x \mid x \ne \frac{5}{6}\}$ B) $(f - g)(x) = 12x - 5$; $\{x \mid x \ne 1\}$

C) $(f - g)(x) = -6x + 1$; all real numbers D) $(f - g)(x) = 6x - 1$; all real numbers

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

48) $f(x) = 7x + 7$; $g(x) = 6x + 6$

Find $f \cdot g$.

A) $(f \cdot g)(x) = 42x^2 + 48x + 42$; $\{x \mid x \ne 42\}$ B) $(f \cdot g)(x) = 13x^2 + 84x + 13$; all real numbers

C) $(f \cdot g)(x) = 42x^2 + 84x + 42$; all real numbers D) $(f \cdot g)(x) = 42x^2 + 42$; $\{x \mid x \ne 42\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

49) $f(x) = 4x + 1$; $g(x) = 3x - 5$

Find $\dfrac{f}{g}$.

A) $(\frac{f}{g})(x) = \dfrac{4x + 1}{3x - 5}$; $\{x \mid x \ne -\frac{1}{4}\}$ B) $(\frac{f}{g})(x) = \dfrac{3x - 5}{4x + 1}$; $\{x \mid x \ne \frac{5}{3}\}$

C) $(\frac{f}{g})(x) = \dfrac{3x - 5}{4x + 1}$; $\{x \mid x \ne -\frac{1}{4}\}$ D) $(\frac{f}{g})(x) = \dfrac{4x + 1}{3x - 5}$; $\{x \mid x \ne \frac{5}{3}\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

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

Find $f + g$.

A) $(f + g)(x) = x^3 - 4x^2 - 16x + 64$; all real numbers B) $(f + g)(x) = -x^2 - x + 20$; $\{x \mid x \ne 4, x \ne -5\}$

C) $(f + g)(x) = -x^2 + x + 12$; all real numbers D) $(f + g)(x) = 4 + x$; $\{x \mid x \ne -4\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

51) $f(x) = x - 5;\ g(x) = 3x^2$

Find $f + g$.

A) $(f + g)(x) = 3x^2 - x + 5;$ all real numbers

B) $(f + g)(x) = -3x^2 + x - 5;$ all real numbers

C) $(f + g)(x) = 3x^2 + x - 5;\ \{x \mid x \neq 5\}$

D) $(f + g)(x) = 3x^2 + x - 5;$ all real numbers

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

52) $f(x) = 5x^3 - 1;\ g(x) = 5x^2 - 3$

Find $f \cdot g$.

A) $(f \cdot g)(x) = 25x^6 - 15x^3 - 5x^2 + 3;$ all real numbers

B) $(f \cdot g)(x) = 5x^3 + 5x^2 + 3;$ all real numbers

C) $(f \cdot g)(x) = 25x^5 - 15x^3 - 5x^2 + 3;$ all real numbers

D) $(f \cdot g)(x) = 25x^5 - 15x^3 - 5x^2 + 3;\ \{x \mid x \neq 0\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

53) $f(x) = \sqrt{x};\ g(x) = 5x - 9$

Find $\frac{f}{g}$.

A) $(\frac{f}{g})(x) = \frac{5x - 9}{\sqrt{x}};\ \{x \mid x \geq 0\}$

B) $(\frac{f}{g})(x) = \frac{\sqrt{x}}{5x - 9};\ \{x \mid x \neq 0\}$

C) $(\frac{f}{g})(x) = \frac{\sqrt{x}}{5x - 9};\ \{x \mid x \geq 0, x \neq \frac{9}{5}\}$

D) $(\frac{f}{g})(x) = \frac{\sqrt{x}}{5x - 9};\ \{x \mid x \neq \frac{9}{5}\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

54) $f(x) = \sqrt{8 - x};\ g(x) = \sqrt{x - 1}$

Find $f \cdot g$.

A) $(f \cdot g)(x) = \sqrt{(8 - x)(x - 1)};\ \{x \mid x \geq 0\}$

B) $(f \cdot g)(x) = \sqrt{(8 - x)(x - 1)};\ \{x \mid x \neq 1, x \neq 8\}$

C) $(f \cdot g)(x) = \sqrt{(8 - x)(x - 1)};\ \{x \mid 1 \leq x \leq 8\}$

D) $(f \cdot g)(x) = \sqrt{-x^2 - 8};\ \{x \mid x \neq 8\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

55) $f(x) = \frac{8x - 5}{3x - 5};\ g(x) = \frac{6x}{3x - 5}$

Find $f - g$.

A) $(f - g)(x) = \frac{2x - 5}{3x - 5};\ \{x \mid x \neq \frac{5}{3}, x \neq \frac{5}{2}\}$

B) $(f - g)(x) = \frac{2x - 5}{3x - 5};\ \{x \mid x \neq 0\}$

C) $(f - g)(x) = \frac{14x + 5}{3x - 5};\ \{x \mid x \neq \frac{5}{3}\}$

D) $(f - g)(x) = \frac{2x - 5}{3x - 5};\ \{x \mid x \neq \frac{5}{3}\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

56) $f(x) = \sqrt{x + 11};\ g(x) = \frac{5}{x}$

Find $f \cdot g$.

A) $(f \cdot g)(x) = \sqrt{\frac{5x + 55}{x}};\ \{x \mid x \geq -11, x \neq 0\}$

B) $(f \cdot g)(x) = \sqrt{\frac{16}{x}};\ \{x \mid x \neq 0\}$

C) $(f \cdot g)(x) = \frac{5\sqrt{x + 11}}{x};\ \{x \mid x \geq -11, x \neq 0\}$

D) $(f \cdot g)(x) = \frac{\sqrt{5x + 55}}{x};\ \{x \mid x \geq -11, x \neq 0\}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

Solve the problem.

57) Given $f(x) = \frac{1}{x}$ and $(\frac{f}{g})(x) = \frac{x + 9}{x^2 - 3x}$, find the function g.

A) $g(x) = \frac{x - 3}{x + 9}$ B) $g(x) = \frac{x + 3}{x - 9}$ C) $g(x) = \frac{x - 9}{x + 3}$ D) $g(x) = \frac{x + 9}{x - 3}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

58) Express the gross salary G of a person who earns $24 per hour as a function of the number x of hours worked.

A) $G(x) = 24x^2$ B) $G(x) = \frac{24}{x}$ C) $G(x) = 24 + x$ D) $G(x) = 24x$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

59) Jacey, a commissioned salesperson, earns $220 base pay plus $41 per item sold. Express Jacey's gross salary G as a function of the number x of items sold.

A) $G(x) = 220x + 41$ B) $G(x) = 41(x + 220)$ C) $G(x) = 220(x + 41)$ D) $G(x) = 41x + 220$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

Find and simplify the difference quotient of f, $\frac{f(x + h) - f(x)}{h}$, $h \neq 0$, for the function.

60) $f(x) = 4x + 9$

A) 4 B) 0 C) $4 + \frac{18}{h}$ D) $4 + \frac{8(x + 9)}{h}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

61) $f(x) = x^2 + 4x + 3$

A) $2x + h + 3$ B) 1

C) $2x + h + 4$ D) $\frac{2x^2 + 2x + 2xh + h^2 + h + 6}{h}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

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

A) 0 B) $\frac{1}{2x}$ C) $\frac{-1}{2x(x + h)}$ D) $\frac{-1}{x(x + h)}$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

Solve the problem.

63) Suppose that P(x) represents the percentage of income spent on leisure activites in year x and I(x) represents income in year x. Determine a function L that represents total leisure activites expenditures in year x.

A) $L(x) = (\frac{I}{P})(x)$ B) $L(x) = (I - P)(x)$ C) $L(x) = (P \cdot I)(x)$ D) $L(x) = (P + I)(x)$

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

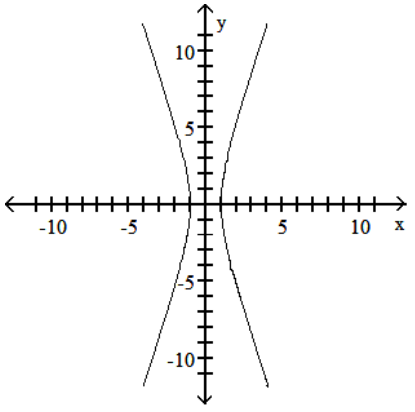
64) A retail store buys 60 VCRs from a distributor at a cost of $195 each plus an overhead charge of $45 per order. The retail markup is 25% on the total price paid. Find the profit on the sale of one VCR.

A) $48.75 B) $48.94 C) $48.56 D) $4894.00

Objective: (1.1) Form the Sum, Difference, Product, and Quotient of Two Functions

Determine whether the graph is that of a function. If it is, use the graph to find its domain and range, the intercepts, if any, and any symmetry with respect to the x–axis, the y–axis, or the origin.

65)



A) function
domain: all real numbers
range: $\{y \mid y \le -1 \text{ or } y \ge 1\}$
intercepts: (–1, 0), (1, 0)
symmetry: y–axis

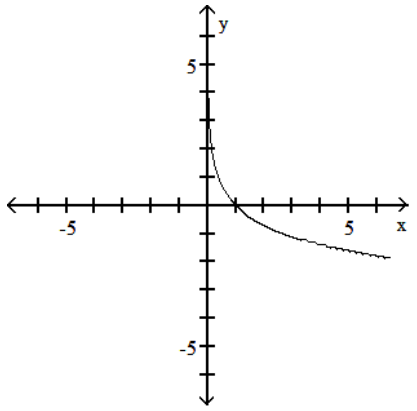
B) function
domain: $\{x \mid -1 \le x \le 1\}$
range: all real numbers
intercepts: (–1, 0), (1, 0)
symmetry: x–axis, y–axis

C) function
domain: $\{x \mid x \le -1 \text{ or } x \ge 1\}$
range: all real numbers
intercepts: (–1, 0), (1, 0)
symmetry: x–axis, y–axis, origin

D) not a function

Objective: (1.2) Identify the Graph of a Function

66)



A) function
domain: $\{x \mid x > 0\}$
range: all real numbers
intercept: (0, 1)
symmetry: origin

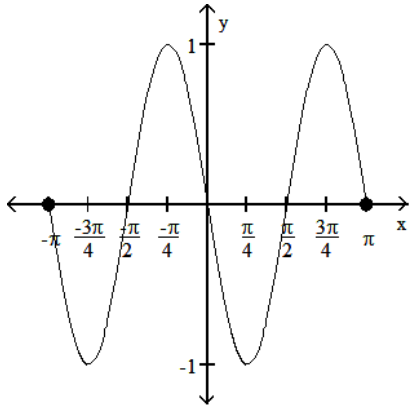
B) function
domain: all real numbers
range: $\{y \mid y > 0\}$
intercept: (1, 0)
symmetry: none

C) function
domain: $\{x \mid x > 0\}$
range: all real numbers
intercept: (1, 0)
symmetry: none

D) not a function

Objective: (1.2) Identify the Graph of a Function

67)



A) function
domain: all real numbers
range: $\{y \mid -1 \le y \le 1\}$
intercepts: $(-\pi, 0), (-\frac{\pi}{2}, 0), (0, 0), (\frac{\pi}{2}, 0), (\pi, 0)$
symmetry: origin

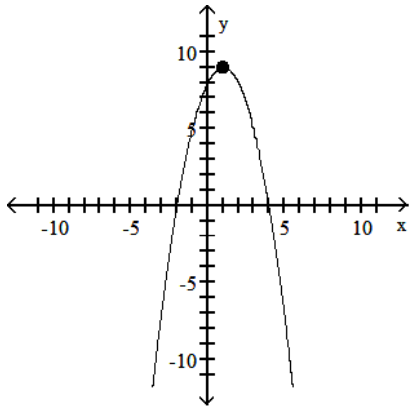
B) function
domain: $\{x \mid -1 \le x \le 1\}$
range: $\{y \mid -\pi \le y \le \pi\}$
intercepts: $(-\pi, 0), (-\frac{\pi}{2}, 0), (0, 0), (\frac{\pi}{2}, 0), (\pi, 0)$
symmetry: none

C) function
domain: $\{x \mid -\pi \le x \le \pi\}$
range: $\{y \mid -1 \le y \le 1\}$
intercepts: $(-\pi, 0), (-\frac{\pi}{2}, 0), (0, 0), (\frac{\pi}{2}, 0), (\pi, 0)$
symmetry: origin

D) not a function

Objective: (1.2) Identify the Graph of a Function

68)



A) function
domain: {x | x ≤ 9}
range: all real numbers
intercepts: (−2, 0), (0, 8), (4, 0)
symmetry: y−axis

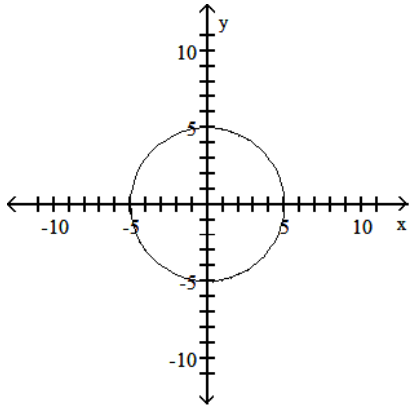
B) function
domain: all real numbers
range: {y | y ≤ 9}
intercepts: (−2, 0), (0, 8), (4, 0)
symmetry: none

C) function
domain: all real numbers
range: {y | y ≤ 9}
intercepts: (0, −2), (8, 0), (0, 4)
symmetry: none

D) not a function

Objective: (1.2) Identify the Graph of a Function

69)



A) function
domain: {x | −5 ≤ x ≤ 5}
range: {y | −5 ≤ y ≤ 5}
intercepts: (−5, 0), (0, −5), (0, 0), (0, 5), (5, 0)
symmetry: origin

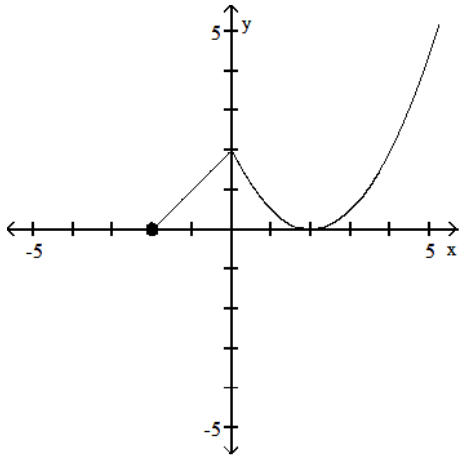
B) function
domain: {x | −5 ≤ x ≤ 5}
range: {y | −5 ≤ y ≤ 5}
intercepts: (−5, 0), (0, −5), (0, 5), (5, 0)
symmetry: x−axis, y−axis

C) function
domain: {x | −5 ≤ x ≤ 5}
range: {y | −5 ≤ y ≤ 5}
intercepts: (−5, 0), (0, −5), (0, 5), (5, 0)
symmetry: x−axis, y−axis, origin

D) not a function

Objective: (1.2) Identify the Graph of a Function

70)



A) function
domain: $\{x \mid x \geq 0\}$
range: $\{y \mid y \geq -2\}$
intercepts: (−2, 0), (0, 2), (2, 0)
symmetry: y−axis

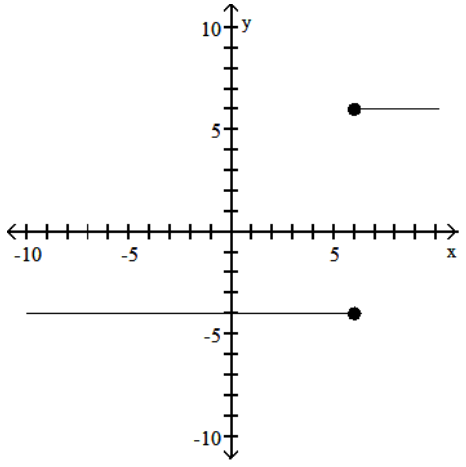
B) function
domain: all real numbers
range: all real numbers
intercepts: (−2, 0), (0, 2), (2, 0)
symmetry: none

C) function
domain: $\{x \mid x \geq -2\}$
range: $\{y \mid y \geq 0\}$
intercepts: (−2, 0), (0, 2), (2, 0)
symmetry: none

D) not a function

Objective: (1.2) Identify the Graph of a Function

71)



A) function
domain: all real numbers
range: all real numbers
intercept: (0, −4)
symmetry: none

B) function
domain: all real numbers
range: $\{y \mid y = 6 \text{ or } y = -4\}$
intercept: (0, −4)
symmetry: none

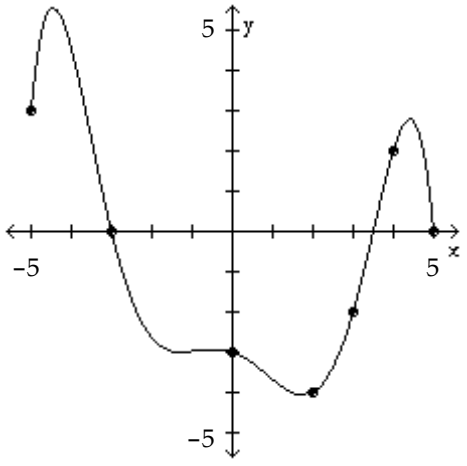
C) function
domain: $\{x \mid x = 6 \text{ or } x = -4\}$
range: all real numbers
intercept: (−4, 0)
symmetry: x−axis

D) not a function

Objective: (1.2) Identify the Graph of a Function

The graph of a function f is given. Use the graph to answer the question.

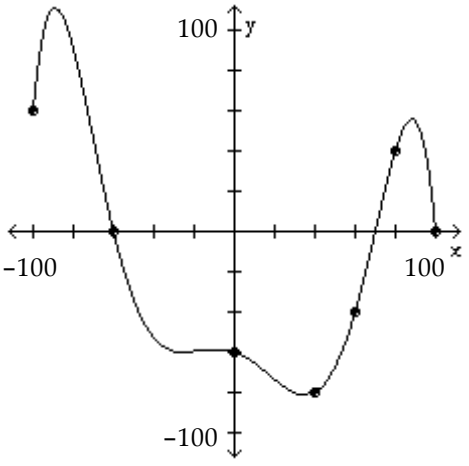
72) Use the graph of f given below to find f(2).



A) −4 B) 0 C) 2 D) 3

Objective: (1.2) Obtain Information from or about the Graph of a Function

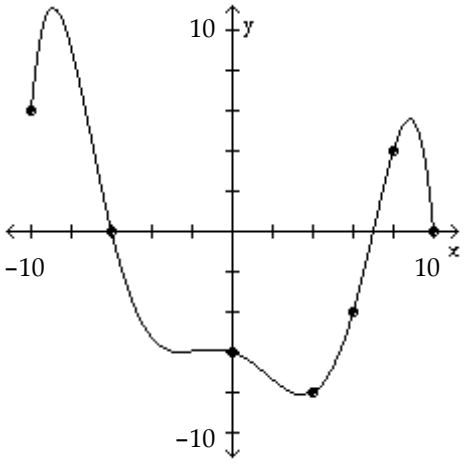
73) Is f(−100) positive or negative?



A) positive B) negative

Objective: (1.2) Obtain Information from or about the Graph of a Function

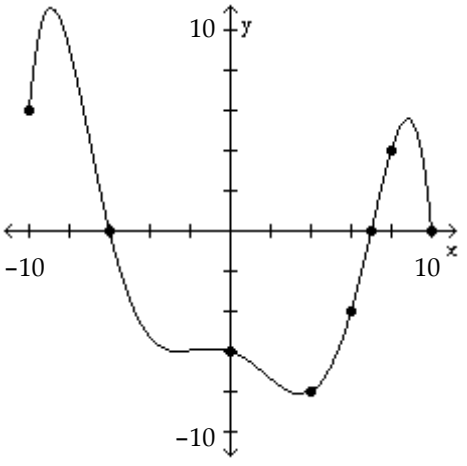
74) Is f(4) positive or negative?



A) positive B) negative

Objective: (1.2) Obtain Information from or about the Graph of a Function

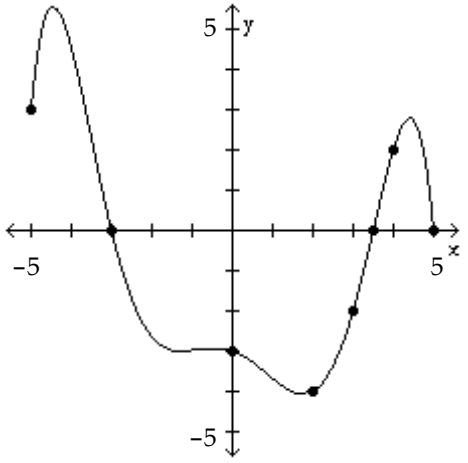
75) For what numbers x is f(x) = 0?



A) −6, 7, 10 B) −6 C) (−10, −6), (7, 10) D) (−6, 7)

Objective: (1.2) Obtain Information from or about the Graph of a Function

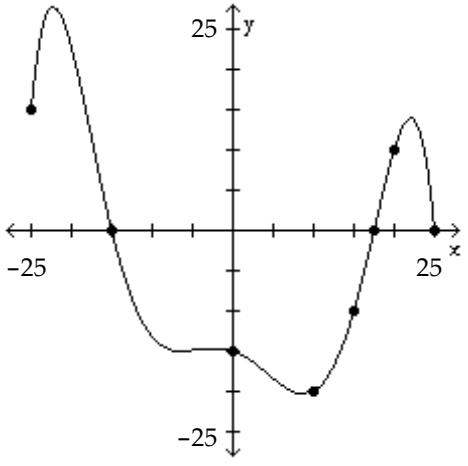
76) For what numbers x is f(x) > 0?



A) (−∞ −3) B) (−3, ∞) C) (−3, 3.5) D) [−5, −3), (3.5, 5)

Objective: (1.2) Obtain Information from or about the Graph of a Function

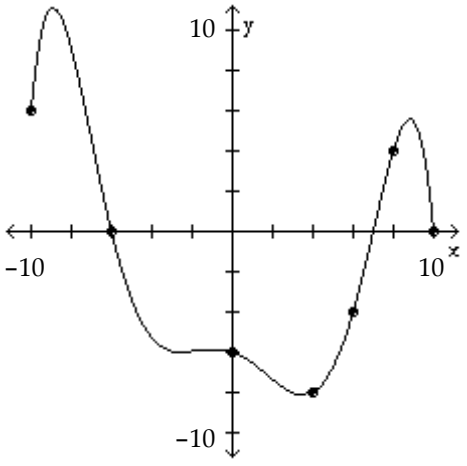
77) For what numbers x is f(x) < 0?



A) (−15, ∞) B) [−25, −15), (17.5, 25) C) (−∞, −15) D) (−15, 17.5)

Objective: (1.2) Obtain Information from or about the Graph of a Function

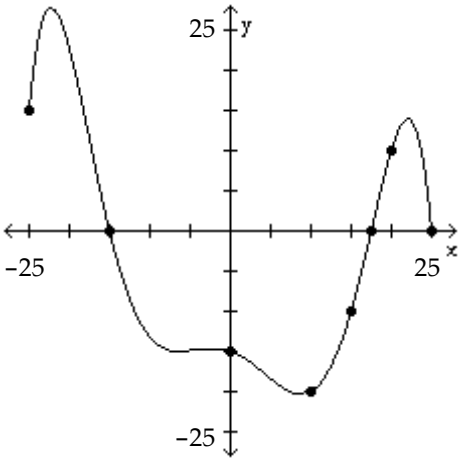
78) What is the domain of f?



A) {x | −8 ≤ x ≤ 11} B) {x | −10 ≤ x ≤ 10} C) all real numbers D) {x | x ≥ 0}

Objective: (1.2) Obtain Information from or about the Graph of a Function

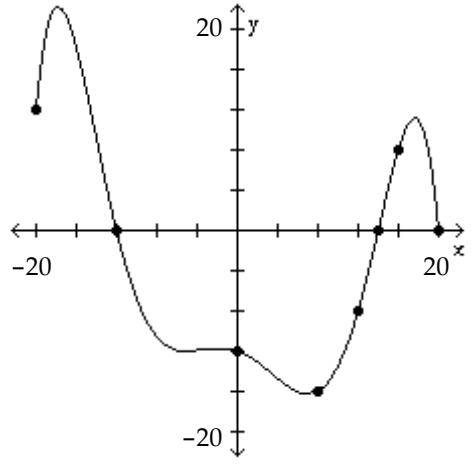
79) What are the x−intercepts?



A) −15, 17.5 B) −25, −15, 17.5, 25 C) −15, 17.5, 25 D) −15

Objective: (1.2) Obtain Information from or about the Graph of a Function

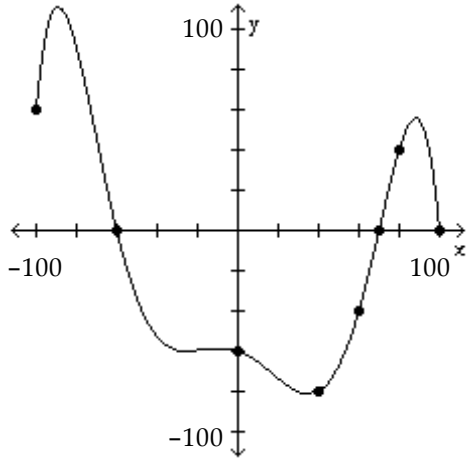
80) What is the y-intercept?



A) -16 B) 20 C) -12 D) 14

Objective: (1.2) Obtain Information from or about the Graph of a Function

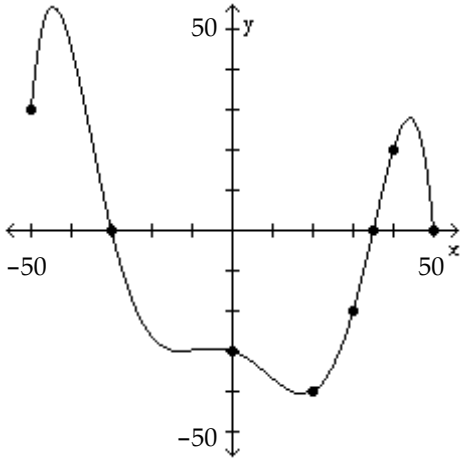
81) How often does the line y = -100 intersect the graph?



A) once B) twice C) three times D) does not intersect

Objective: (1.2) Obtain Information from or about the Graph of a Function

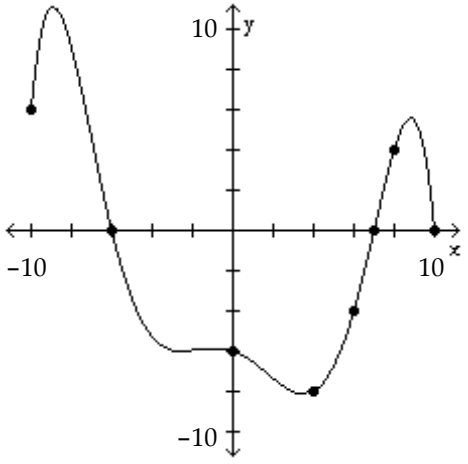
82) How often does the line y = 10 intersect the graph?



A) once B) twice C) three times D) does not intersect

Objective: (1.2) Obtain Information from or about the Graph of a Function

83) For which of the following values of x does f(x) = 4?



A) 4 B) 10 C) 14 D) 8

Objective: (1.2) Obtain Information from or about the Graph of a Function

Answer the question about the given function.

84) Given the function $f(x) = 5x^2 + 10x + 1$, is the point (−1, −4) on the graph of f?

A) Yes B) No

Objective: (1.2) Obtain Information from or about the Graph of a Function

85) Given the function $f(x) = -7x^2 - 14x + 4$, is the point (−2, −10) on the graph of f?

A) Yes B) No

Objective: (1.2) Obtain Information from or about the Graph of a Function

86) Given the function $f(x) = 5x^2 - 10x + 8$, if x = 1, what is f(x)? What point is on the graph of f?

A) 3; (1, 3) B) 3; (3, 1) C) 23; (23, 1) D) 23; (1, 23)

Objective: (1.2) Obtain Information from or about the Graph of a Function

87) Given the function $f(x) = 3x^2 + 6x - 7$, what is the domain of f?

A) all real numbers B) $\{x \mid x \geq -1\}$ C) $\{x \mid x \leq -1\}$ D) $\{x \mid x \geq 1\}$

Objective: (1.2) Obtain Information from or about the Graph of a Function

88) Given the function $f(x) = x^2 + 3x - 54$, list the x-intercepts, if any, of the graph of f.

A) (9, 0), (6, 0) B) (−9, 0), (1, 0) C) (9, 0), (−6, 0) D) (−9, 0), (6, 0)

Objective: (1.2) Obtain Information from or about the Graph of a Function

89) Given the function $f(x) = 2x^2 - 4x - 6$, list the y-intercept, if there is one, of the graph of f.

A) −6 B) −2 C) −8 D) 0

Objective: (1.2) Obtain Information from or about the Graph of a Function

90) Given the function $f(x) = \frac{x^2 - 4}{x + 3}$, is the point (−2, 0) on the graph of f?

A) Yes B) No

Objective: (1.2) Obtain Information from or about the Graph of a Function

91) Given the function $f(x) = \frac{x^2 - 9}{x - 3}$, is the point $(-1, -\frac{5}{2})$ on the graph of f?

A) Yes B) No

Objective: (1.2) Obtain Information from or about the Graph of a Function

92) Given the function $f(x) = \frac{x^2 - 5}{x - 1}$, if x = −2, what is f(x)? What point is on the graph of f?

A) $\frac{1}{3}$; $(\frac{1}{3}, -2)$ B) − 3; (− 3, −2) C) − 3; (−2, − 3) D) $\frac{1}{3}$; $(-2, \frac{1}{3})$

Objective: (1.2) Obtain Information from or about the Graph of a Function

93) Given the function $f(x) = \frac{x^2 + 3}{x - 9}$, what is the domain of f?

A) $\{x \mid x \neq 3\}$ B) $\{x \mid x \neq 9\}$ C) $\{x \mid x \neq \frac{1}{3}\}$ D) $\{x \mid x \neq -9\}$

Objective: (1.2) Obtain Information from or about the Graph of a Function

94) Given the function $f(x) = \frac{x^2 + 6}{x - 7}$, list the x-intercepts, if any, of the graph of f.

A) $(-\sqrt{6}, 0)$ B) (6, 0), (−6, 0) C) (7, 0) D) none

Objective: (1.2) Obtain Information from or about the Graph of a Function

95) Given the function $f(x) = \frac{x^2 + 4}{x + 7}$, list the y-intercept, if there is one, of the graph of f.

A) (0, −4) B) (0, −7) C) $(0, \frac{4}{7})$ D) $(\frac{4}{7}, 0)$

Objective: (1.2) Obtain Information from or about the Graph of a Function

Solve the problem.

96) If an object weighs m pounds at sea level, then its weight W (in pounds) at a height of h miles above sea level is given approximately by $W(h) = m\left(\frac{4000}{4000 + h}\right)^2$. How much will a man who weighs 165 pounds at sea level weigh on the top of a mountain which is 14,494 feet above sea level? Round to the nearest hundredth of a pound, if necessary.

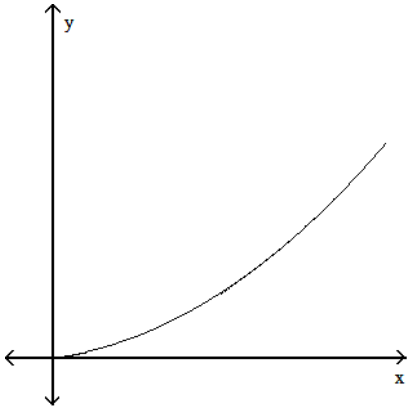
A) 165.23 pounds B) 165 pounds C) 7.72 pounds D) 164.77 pounds

Objective: (1.2) Obtain Information from or about the Graph of a Function

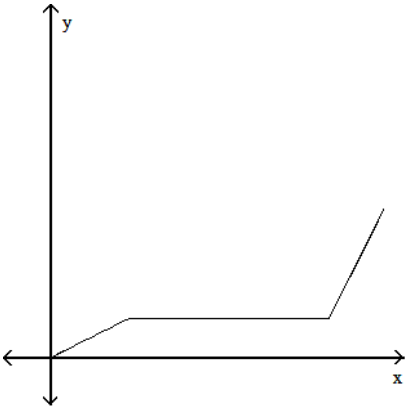
Match the function with the graph that best describes the situation.

97) The amount of rainfall as a function of time, if the rain fell more and more softly.

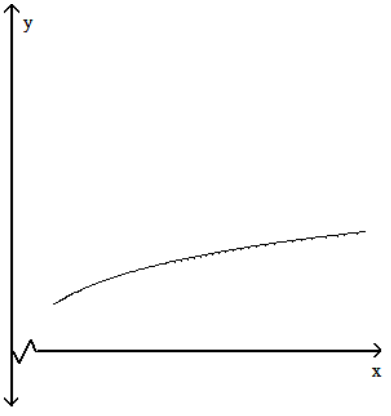
A)



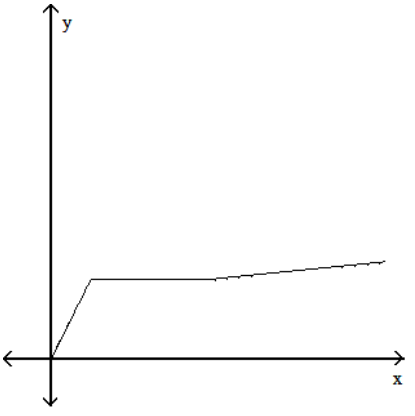
B)



C)



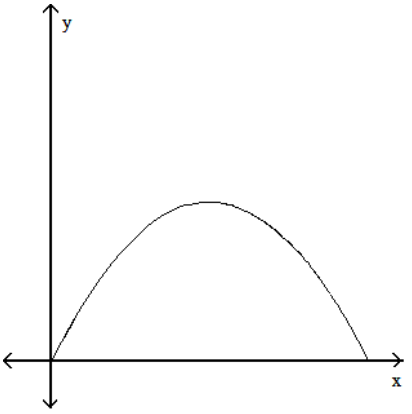
D)



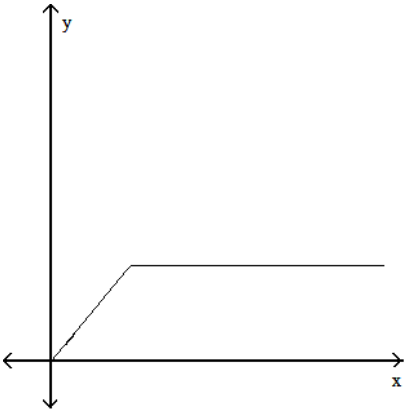
Objective: (1.2) Obtain Information from or about the Graph of a Function

98) The height of an animal as a function of time.

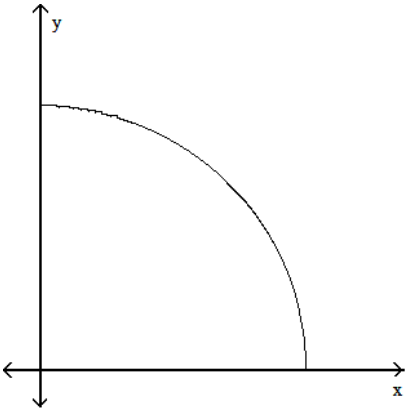
A)



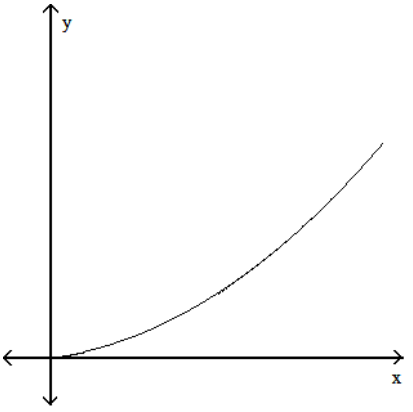
B)



C)



D)

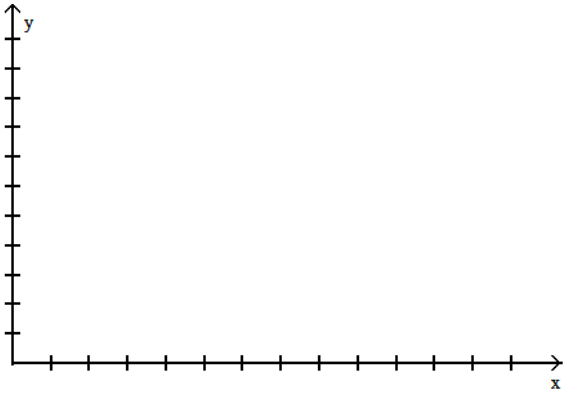


Objective: (1.2) Obtain Information from or about the Graph of a Function

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

Solve the problem.

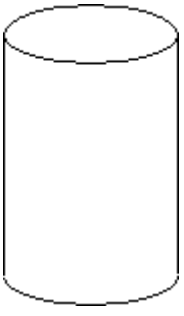
99) Michael decides to walk to the mall to do some errands. He leaves home, walks 4 blocks in 14 minutes at a constant speed, and realizes that he forgot his wallet at home. So Michael runs back in 11 minutes. At home, it takes him 3 minutes to find his wallet and close the door. Michael walks 3 blocks in 12 minutes and then decides to jog to the mall. It takes him 9 minutes to get to the mall which is 3 blocks away. Draw a graph of Michael's distance from home (in blocks) as a function of time.



Objective: (1.2) Obtain Information from or about the Graph of a Function

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

100) A steel can in the shape of a right circular cylinder must be designed to hold 700 cubic centimeters of juice (see figure). It can be shown that the total surface area of the can (including the ends) is given by $S(r) = 2\pi r^2 + \frac{1400}{r}$, where r is the radius of the can in centimeters. Using the TABLE feature of a graphing utility, find the radius that minimizes the surface area (and thus the cost) of the can. Round to the nearest tenth of a centimeter.



A) 0 cm B) 4.8 cm C) 4 cm D) 6 cm

Objective: (1.2) Obtain Information from or about the Graph of a Function

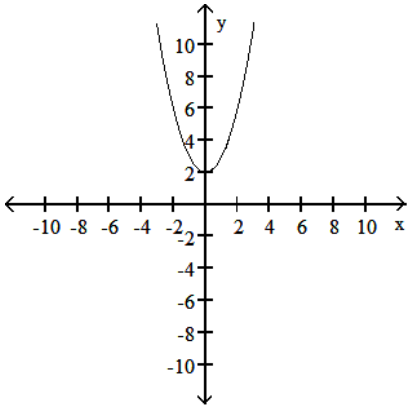
101) The concentration C (arbitrary units) of a certain drug in a patient's bloodstream can be modeled using $C(t) = \frac{t}{(0.426t + 2.345)^2}$, where t is the number of hours since a 500 milligram oral dose was administered. Using the TABLE feature of a graphing utility, find the time at which the concentration of the drug is greatest. Round to the nearest tenth of an hour.

A) 5.5 hours B) 7.8 hours C) 6.3 hours D) 7 hours

Objective: (1.2) Obtain Information from or about the Graph of a Function

The graph of a function is given. Decide whether it is even, odd, or neither.

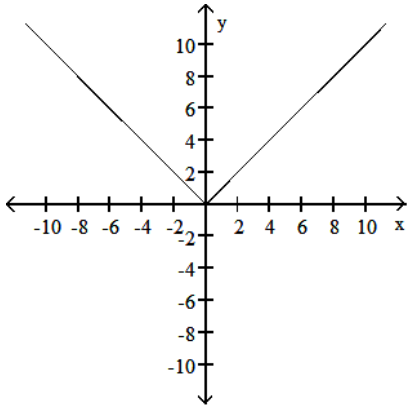
102)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

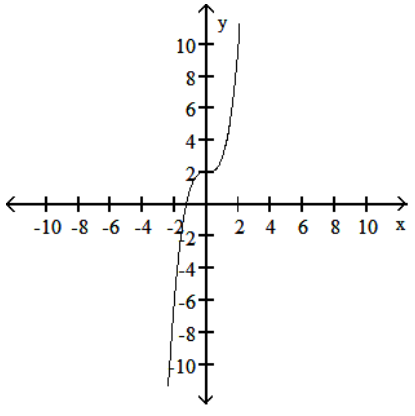
103)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

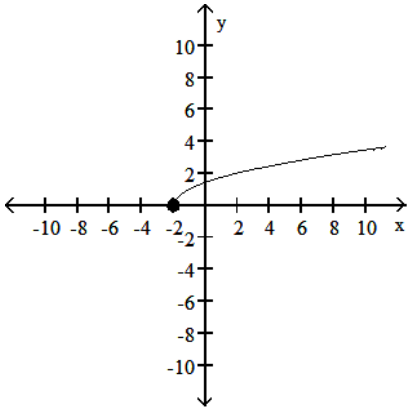
104)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

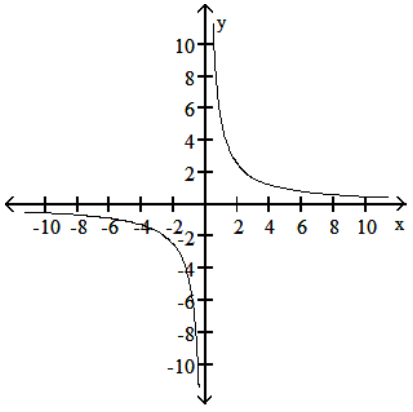
105)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

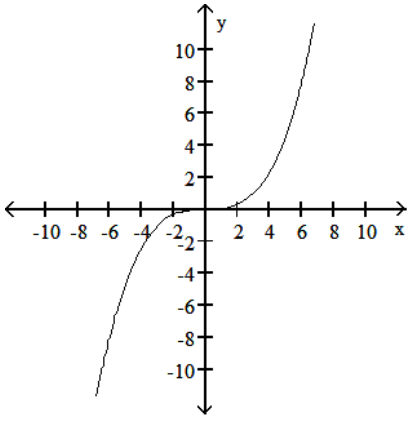
106)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

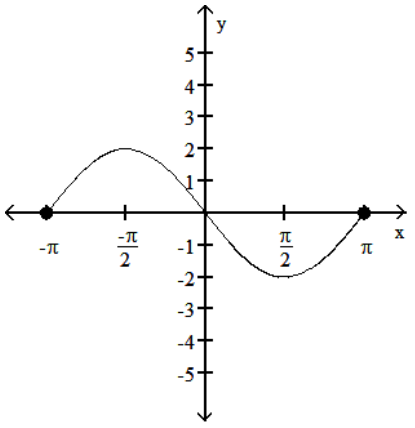
107)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

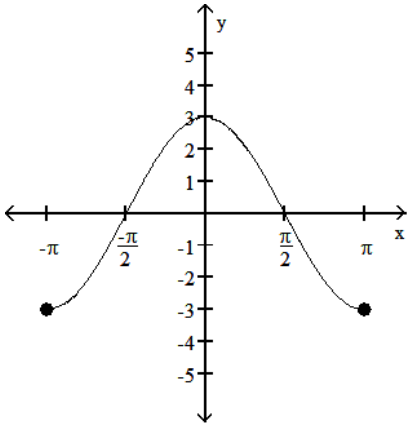
108)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

109)



A) even B) odd C) neither

Objective: (1.3) Determine Even and Odd Functions from a Graph

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

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

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

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

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

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

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

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

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

114) $f(x) = \sqrt[3]{x}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

115) $f(x) = \sqrt{x}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

116) $\sqrt[3]{9x^2 + 7}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

117) $f(x) = \dfrac{1}{x^2}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

118) $f(x) = \dfrac{x}{x^2 + 3}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

119) $f(x) = \dfrac{-x^3}{4x^2 - 5}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

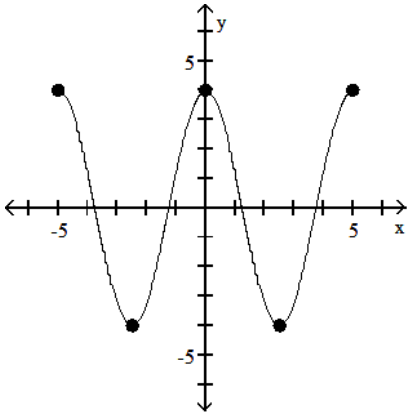
120) $f(x) = \dfrac{-2x}{|x|}$

A) even B) odd C) neither

Objective: (1.3) Identify Even and Odd Functions from the Equation

The graph of a function is given. Determine whether the function is increasing, decreasing, or constant on the given interval.

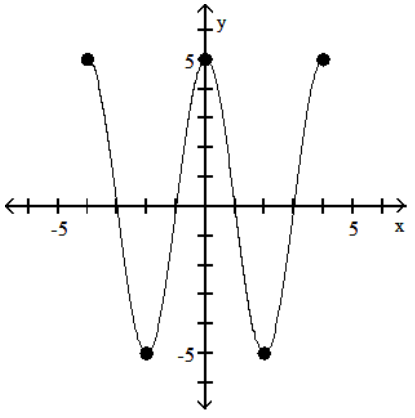
121) $(-5, -\frac{5}{2})$



A) increasing B) decreasing C) constant

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

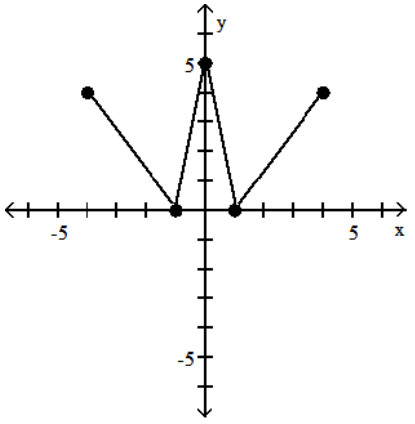
122) (– 2, 0)



A) constant B) increasing C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

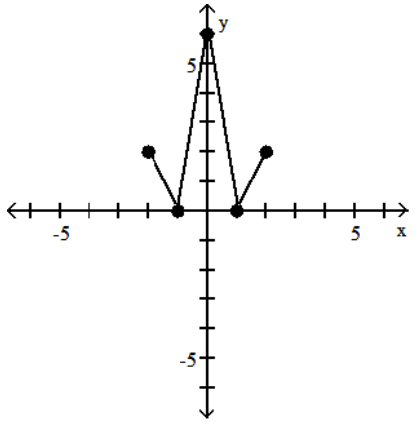
123) (0, 1)



A) constant B) increasing C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

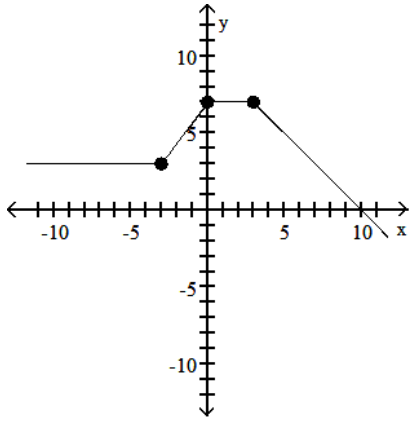
124) (1, 2)



A) constant B) increasing C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

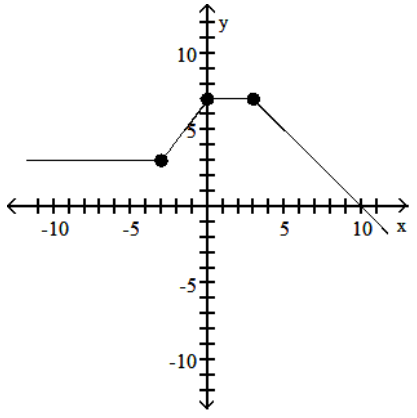
125) (0, 3)



A) constant B) decreasing C) increasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

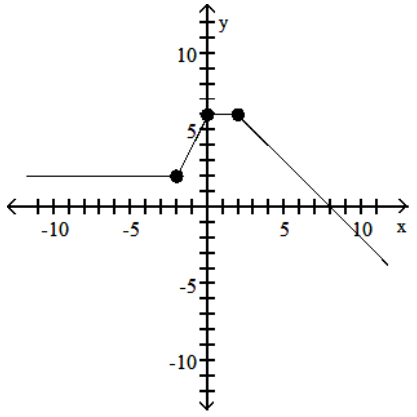
126) (−3, 0)



A) increasing B) constant C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

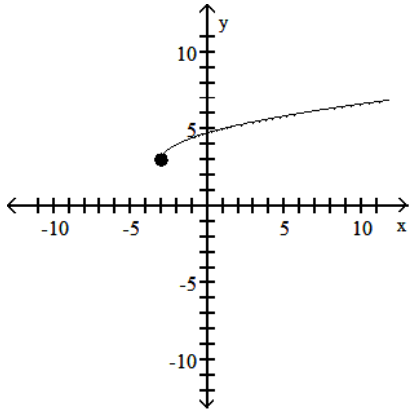
127) (2, ∞)



A) increasing B) constant C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

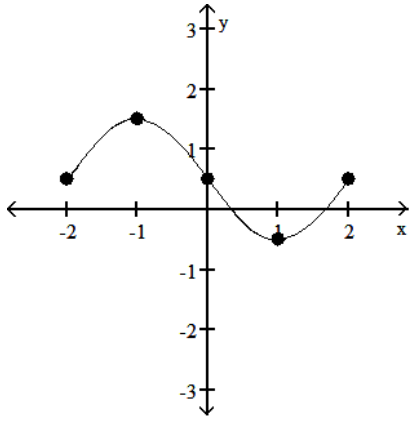
128) (−3, ∞)



A) decreasing B) increasing C) constant

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

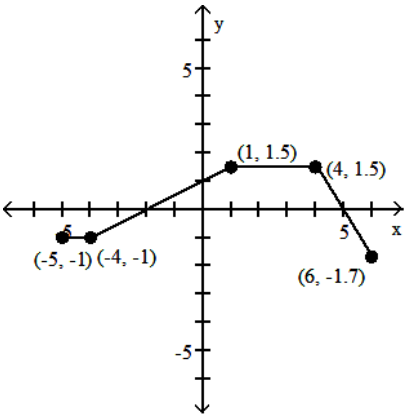
129) (0, 1)



A) constant B) decreasing C) increasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

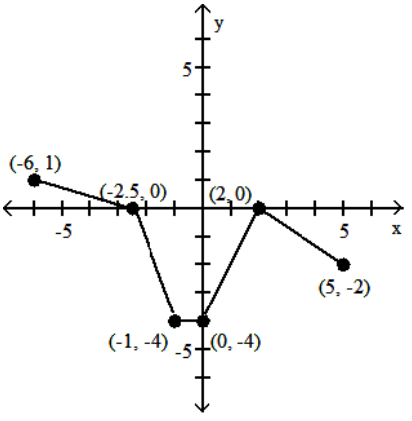
130) (4, 3)



A) increasing B) constant C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

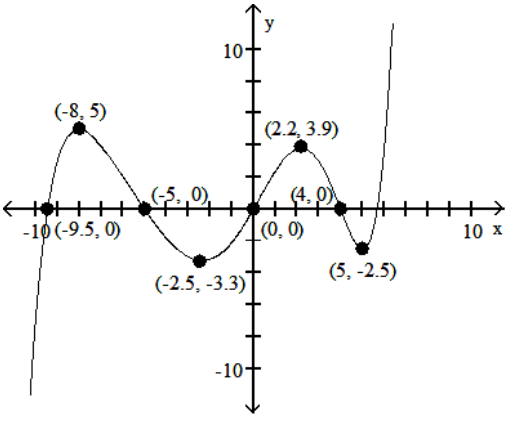
131) (−2.5, −1)



A) constant B) increasing C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

132) (2.2, 5)

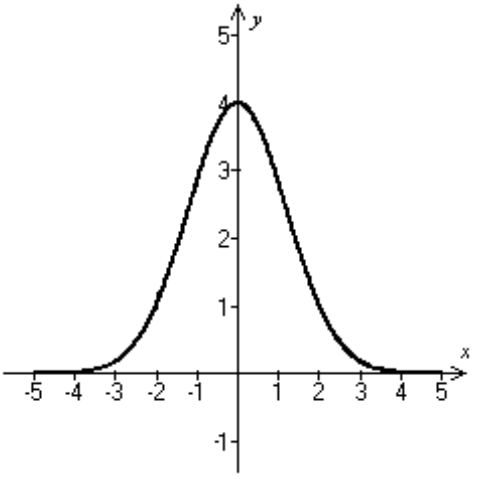


A) increasing B) constant C) decreasing

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

Use the graph to find the intervals on which it is increasing, decreasing, or constant.

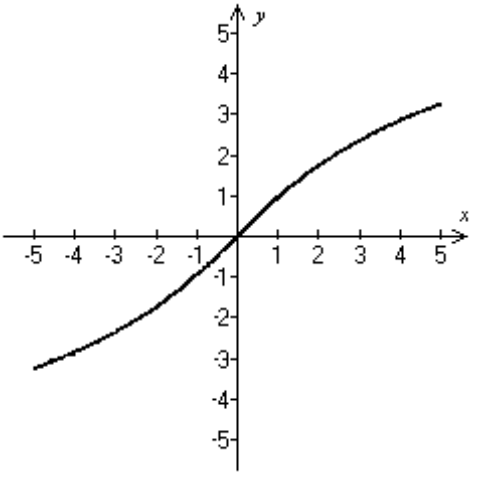
133)



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

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

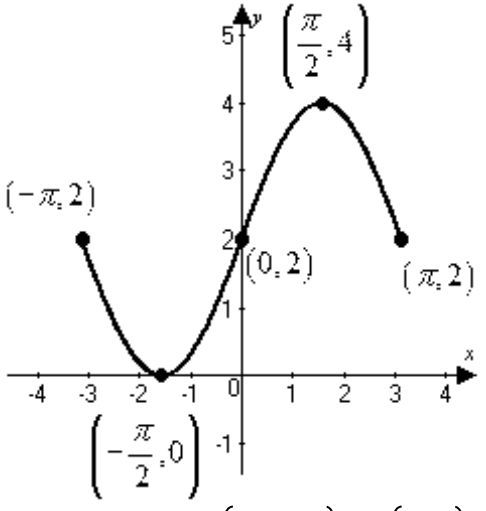
134)



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

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

135)



A) Decreasing on $\left(-\pi, -\frac{\pi}{2}\right]$ and $\left[\frac{\pi}{2}, \pi\right)$; increasing on $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

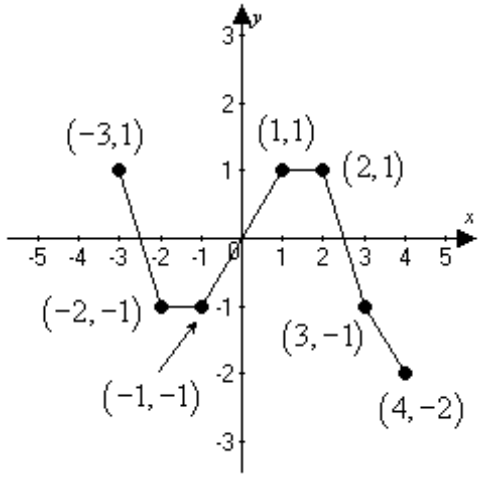
B) Increasing on $(-\infty, \infty)$

C) Decreasing on $(-\pi, 0)$; increasing on $(0, \pi)$

D) Increasing on $\left(-\pi, -\frac{\pi}{2}\right]$ and $\left[\frac{\pi}{2}, \pi\right)$; decreasing on $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

136)



A) Decreasing on (−3, −1) and (1, 4); increasing on (−2, 1)

B) Decreasing on (−3, −2) and (2, 4); increasing on (−1, 1)

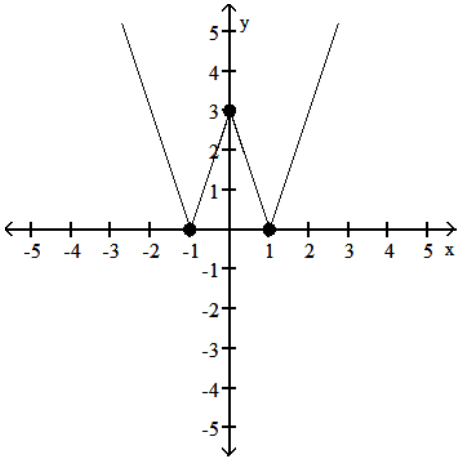
C) Increasing on (−3, −2) and (2, 4); decreasing on (−1, 1); constant on (−2, −1) and (1, 2)

D) Decreasing on (−3, −2) and (2, 4); increasing on (−1, 1); constant on (−2, −1) and (1, 2)

Objective: (1.3) Use a Graph to Determine Where a Function Is Increasing, Decreasing, or Constant

The graph of a function f is given. Use the graph to answer the question.

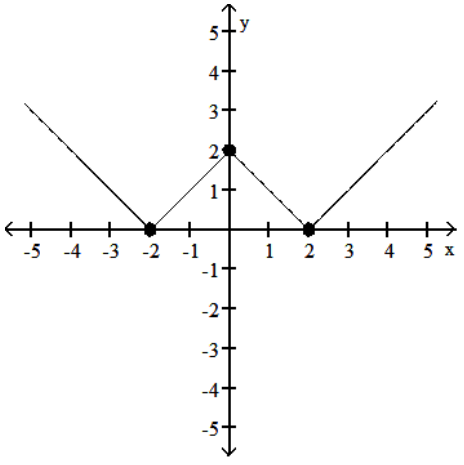
137) Find the numbers, if any, at which f has a local maximum. What are the local maxima?



A) f has a local maximum at x = 1; the local maximum is 3
B) f has a local maximum at x = 0; the local maximum is 3
C) f has a local maximum at x = −1 and 1; the local maximum is 0
D) f has no local maximum

Objective: (1.3) Use a Graph to Locate Local Maxima and Local Minima

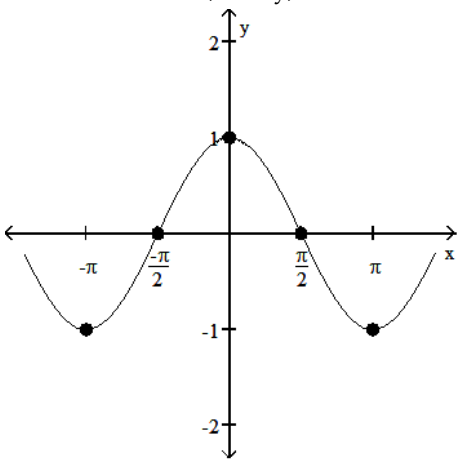
138) Find the numbers, if any, at which f has a local minimum. What are the local minima?



A) f has a local minimum at x = −2; the local minimum is 0
B) f has a local minimum at x = −2 and 2; the local minimum is 0
C) f has a local minimum at x = 0; the local minimum is 2
D) f has no local minimum

Objective: (1.3) Use a Graph to Locate Local Maxima and Local Minima

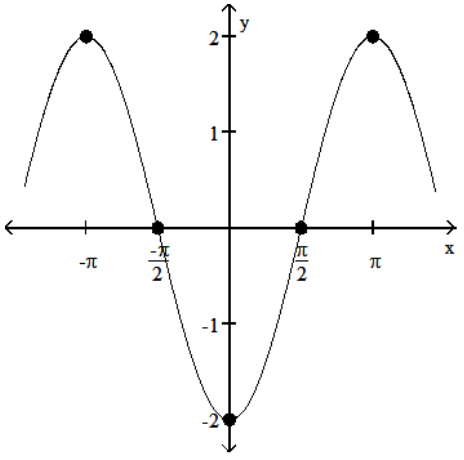
139) Find the numbers, if any, at which f has a local maximum. What are the local maxima?



A) f has a local maximum at x = −π and π; the local maximum is −1
B) f has a local maximum at −π; the local maximum is 1
C) f has a local maximum at x = 0; the local maximum is 1
D) f has no local maximum

Objective: (1.3) Use a Graph to Locate Local Maxima and Local Minima

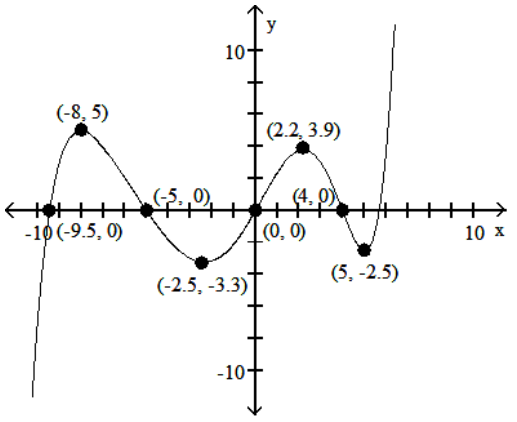
140) Find the numbers, if any, at which f has a local minimum. What are the local minima?



A) f has a local minimum at x = −π and π; the local minimum is 2
B) f has no local minimum
C) f has a local minimum at x = −π; the local minimum is −2
D) f has a local minimum at x = 0; the local minimum is −2

Objective: (1.3) Use a Graph to Locate Local Maxima and Local Minima

141)



Find the numbers, if any, at which f has a local maximum. What are the local maxima?

A) f has a local minimum at x = 5 and 3.9; the local minimum at 5 is −8; the local minimum at 3.9 is 2.2

B) f has a local maximum at x = 5 and 3.9; the local maximum at 5 is −8; the local maximum at 3.9 is 2.2

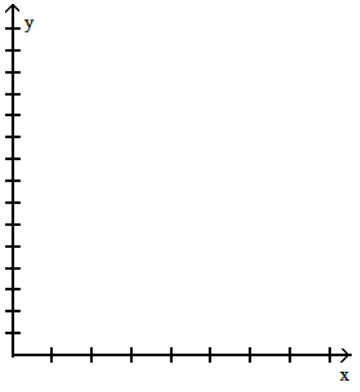
C) f has a local minimum at x = −8 and 2.2; the local minimum at −8 is 5; the local minimum at 2.2 is 3.9

D) f has a local maximum at x = −8 and 2.2; the local maximum at −8 is 5; the local maximum at 2.2 is 3.9

Objective: (1.3) Use a Graph to Locate Local Maxima and Local Minima

Solve the problem.

142) The height s of a ball (in feet) thrown with an initial velocity of 70 feet per second from an initial height of 5 feet is given as a function of time t (in seconds) by $s(t) = -16t^2 + 70t + 5$. What is the maximum height? Round to the nearest hundredth, if necessary.

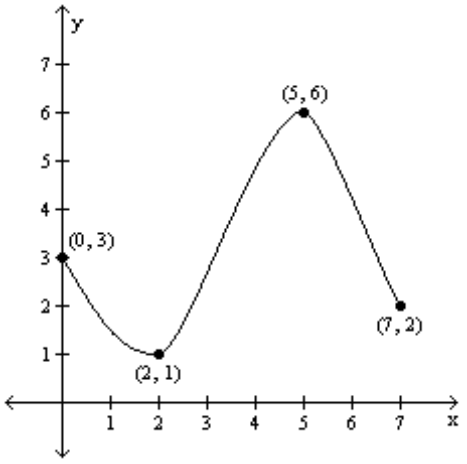


A) −54.37 ft B) 92.5 ft C) 81.56 ft D) 76.88 ft

Objective: (1.3) Use a Graph to Locate Local Maxima and Local Minima

For the graph of the function y = f(x), find the absolute maximum and the absolute minimum, if it exists.

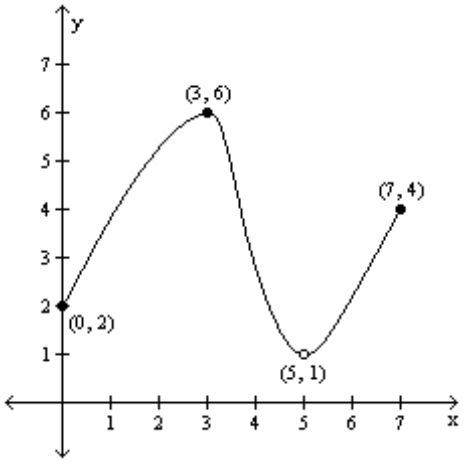
143)



A) Absolute maximum: f(5) = 6; Absolute minimum: f(2) = 1
B) Absolute maximum: f(7) = 2; Absolute minimum: f(0) = 3
C) Absolute maximum: f(2) = 7; Absolute minimum: f(3) = 0
D) Absolute maximum: f(6) = 5; Absolute minimum: f(1) = 2

Objective: (1.3) Use a Graph to Locate the Absolute Maximum and the Absolute Minimum

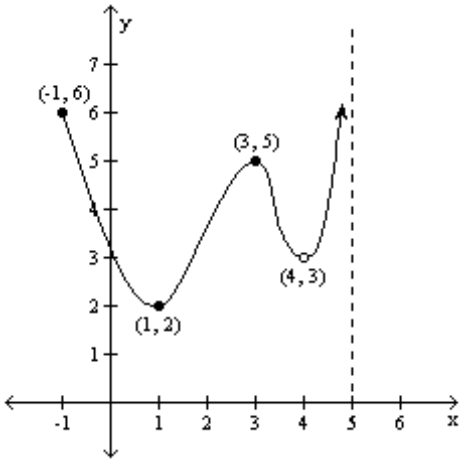
144)



A) Absolute maximum: f(3) = 6; Absolute minimum: f(5) = 1
B) Absolute maximum: f(3) = 6; Absolute minimum: none
C) Absolute maximum: f(3) = 6; Absolute minimum: f(0) = 2
D) Absolute maximum: f(7) = 4; Absolute minimum: f(0) = 2

Objective: (1.3) Use a Graph to Locate the Absolute Maximum and the Absolute Minimum

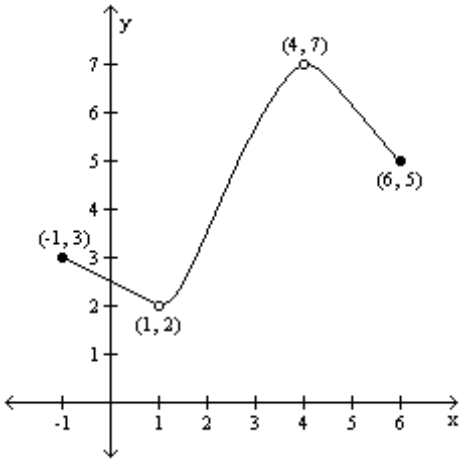
145)



A) Absolute maximum: f(−1) = 6; Absolute minimum: f(1) = 2
B) Absolute maximum: f(3) = 5; Absolute minimum: f(1) = 2
C) Absolute maximum: none; Absolute minimum: none
D) Absolute maximum: none; Absolute minimum: f(1) = 2

Objective: (1.3) Use a Graph to Locate the Absolute Maximum and the Absolute Minimum

146)



A) Absolute maximum: f(4) = 7; Absolute minimum: f(1) = 2
B) Absolute maximum: none; Absolute minimum: f(1) = 2
C) Absolute maximum: none; Absolute minimum: none
D) Absolute maximum: f(4) = 7; Absolute minimum: none

Objective: (1.3) Use a Graph to Locate the Absolute Maximum and the Absolute Minimum

Use a graphing utility to graph the function over the indicated interval and approximate any local maxima and local minima. Determine where the function is increasing and where it is decreasing. If necessary, round answers to two decimal places.

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

A) local maximum at (0, 3)
local minimum at (2, −1)
increasing on (−1, 0) and (2, 3)
decreasing on (0, 2)

B) local maximum at (2, −1)
local minimum at (0, 3)
increasing on (−1, 0)
decreasing on (0, 2)

C) local maximum at (2, −1)
local minimum at (0, 3)
increasing on (−1, 0) and (2, 3)
decreasing on (0, 2)

D) local maximum at (0, 3)
local minimum at (2, −1)
increasing on (0, 2)
decreasing on (−1, 0) and (2, 3)

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

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

148) $f(x) = x^3 - 4x^2 + 6;\ (-1, 4)$

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

149) $f(x) = x^5 - x^2;\ (-2, 2)$

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

150) $f(x) = -0.3x^3 + 0.2x^2 + 4x - 5;\ (-4, 5)$

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

151) $f(x) = 0.15x^4 + 0.3x^3 - 0.8x^2 + 5;\ (-4, 2)$

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

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

Use a graphing utility to graph the function over the indicated interval and approximate any local maxima and local minima. If necessary, round answers to two decimal places.

152) $f(x) = x^2 + 2x - 3;\ (-5, 5)$

A) local minimum at (1, 4)
B) local minimum at (−1, −4)
C) local maximum at (1, −4)
D) local maximum at (−1, 4)

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

153) $f(x) = 2 + 8x - x^2;\ (-5, 5)$

A) local maximum at (−4, 50)
B) local maximum at (4, 18)
C) local minimum at (−4, 18)
D) local minimum at (4, 50)

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

154) $f(x) = x^3 - 3x^2 + 1;\ (-5, 5)$

A) local minimum at (2, −3)

B) local maximum at (0, 1)
local minimum at (2, −3)

C) local minimum at (0, 1)
local maximum at (2, −3)

D) none

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

155) $f(x) = x^3 - 12x + 2;\ (-5, 5)$

A) local maximum at (−2, 18)
local minimum at (2, −14)

B) local minimum at (0, 0)

C) local maximum at (−2, 18)
local minimum at (0, 0)
local minimum at (2, −14)

D) none

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

156) $f(x) = x^4 - 5x^3 + 3x^2 + 9x - 3;\ (-5, 5)$

A) local minimum at (−0.57, −6.12)
local maximum at (1.32, 5.64)
local minimum at (3, −3)

B) local minimum at (−3, −3)
local maximum at (−1.32, 5.64)
local minimum at (0.57, −6.12)

C) local minimum at (−1, −6)
local maximum at (1, 6)
local minimum at (3, −3)

D) local minimum at (−0.61, −5.64)
local maximum at (1.41, 6.12)
local minimum at (3, −3)

Objective: (1.3) Use Graphing Utility to Approximate Local Maxima/Minima and to Determine Where Function Is Incrs/Decrs

For the function, find the average rate of change of f from 1 to x:

$\dfrac{f(x) - f(1)}{x - 1}, x \neq 1$

157) $f(x) = -9x$

A) −10 B) −9 C) $\dfrac{-9}{x - 1}$ D) 0

Objective: (1.3) Find the Average Rate of Change of a Function

158) $f(x) = x^3 + x$

A) $\dfrac{x^3 + x + 2}{x - 1}$ B) $x^2 + x + 2$ C) 1 D) $x^2 + 2$

Objective: (1.3) Find the Average Rate of Change of a Function

159) $f(x) = \dfrac{8}{x + 7}$

A) $\dfrac{8}{x(x + 7)}$ B) $\dfrac{8}{(x - 1)(x + 7)}$ C) $\dfrac{1}{x + 7}$ D) $-\dfrac{1}{x + 7}$

Objective: (1.3) Find the Average Rate of Change of a Function

160) $f(x) = \sqrt{x + 63}$

A) $\frac{\sqrt{x + 63} - 8}{x + 1}$ B) $\frac{\sqrt{x + 63} - 8}{x - 1}$ C) $\frac{\sqrt{x + 63} + 8}{x + 1}$ D) $\frac{\sqrt{x + 63} + 8}{x - 1}$

Objective: (1.3) Find the Average Rate of Change of a Function

Find the average rate of change for the function between the given values.

161) $f(x) = -3x + 6$; from 1 to 2

A) 6 B) 3 C) −3 D) −6

Objective: (1.3) Find the Average Rate of Change of a Function

162) $f(x) = x^2 + 2x$; from 1 to 3

A) 4 B) 5 C) 6 D) $\frac{15}{2}$

Objective: (1.3) Find the Average Rate of Change of a Function

163) $f(x) = 9x^3 + 7x^2 - 3$; from −7 to 4

A) $\frac{685}{11}$ B) 858 C) $\frac{685}{4}$ D) 312

Objective: (1.3) Find the Average Rate of Change of a Function

164) $f(x) = \sqrt{2x}$; from 2 to 8

A) $-\frac{3}{10}$ B) $\frac{1}{3}$ C) 2 D) 7

Objective: (1.3) Find the Average Rate of Change of a Function

165) $f(x) = \frac{3}{x - 2}$; from 4 to 7

A) 2 B) 7 C) $\frac{1}{3}$ D) $-\frac{3}{10}$

Objective: (1.3) Find the Average Rate of Change of a Function

166) $f(x) = 4x^2$; from 0 to $\frac{7}{4}$

A) 7 B) 2 C) $-\frac{3}{10}$ D) $\frac{1}{3}$

Objective: (1.3) Find the Average Rate of Change of a Function

167) $f(x) = -3x^2 - x$; from 5 to 6

A) $\frac{1}{2}$ B) $-\frac{1}{6}$ C) −2 D) −34

Objective: (1.3) Find the Average Rate of Change of a Function

168) $f(x) = x^3 + x^2 - 8x - 7$; from 0 to 2

A) $\frac{1}{2}$ B) −2 C) $-\frac{1}{6}$ D) −28

Objective: (1.3) Find the Average Rate of Change of a Function

169) $f(x) = \sqrt{2x - 1}$; from 1 to 5

A) −28 B) $-\frac{1}{6}$ C) $\frac{1}{2}$ D) −2

Objective: (1.3) Find the Average Rate of Change of a Function

170) $f(x) = \frac{3}{x + 2}$; from 1 to 4

A) −28 B) −2 C) $\frac{1}{2}$ D) $-\frac{1}{6}$

Objective: (1.3) Find the Average Rate of Change of a Function

Find an equation of the secant line containing (1, f(1)) and (2, f(2)).

171) $f(x) = x^2 - 2x$

A) $y = x - 2$ B) $y = x + 2$ C) $y = -x + 2$ D) $y = -x - 2$

Objective: (1.3) Find the Average Rate of Change of a Function

172) $f(x) = \frac{5}{x + 4}$

A) $y = \frac{1}{6}x + \frac{7}{5}$ B) $y = \frac{1}{6}x + \frac{5}{6}$ C) $y = \frac{5}{6}x + \frac{1}{6}$ D) $y = -\frac{1}{6}x + \frac{7}{6}$

Objective: (1.3) Find the Average Rate of Change of a Function

173) $f(x) = \sqrt{x + 8}$

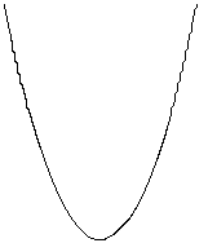
A) $y = (-\sqrt{10} + 3)x + \sqrt{10} - 6$ B) $y = (\sqrt{10} - 3)x - \sqrt{10} + 6$

C) $y = (-\sqrt{10} - 3)x - \sqrt{10} + 6$ D) $y = (\sqrt{10} - 3)x + \sqrt{10} - 6$

Objective: (1.3) Find the Average Rate of Change of a Function

Match the graph to the function listed whose graph most resembles the one given.

174)



A) cube function B) reciprocal function

C) absolute value function D) square function

Objective: (1.4) Graph the Functions Listed in the Library of Functions

175)

A) linear function B) reciprocal function

C) absolute value function D) constant function

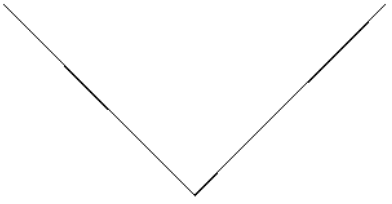
Objective: (1.4) Graph the Functions Listed in the Library of Functions

176)

A) square root function
B) cube root function
C) square function
D) cube function

Objective: (1.4) Graph the Functions Listed in the Library of Functions

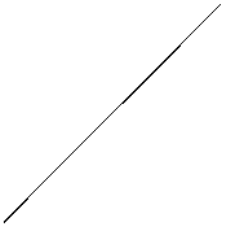
177)



A) absolute value function
B) reciprocal function
C) square function
D) linear function

Objective: (1.4) Graph the Functions Listed in the Library of Functions

178)



A) linear function
B) absolute value function
C) constant function
D) reciprocal function

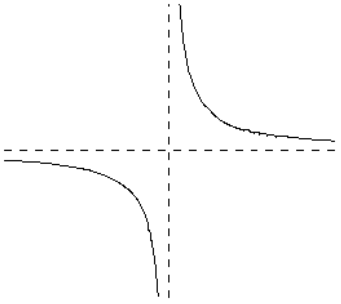
Objective: (1.4) Graph the Functions Listed in the Library of Functions

179)

A) square function
B) cube root function
C) cube function
D) square root function

Objective: (1.4) Graph the Functions Listed in the Library of Functions

180)



A) square function
B) square root function
C) reciprocal function
D) absolute value function

Objective: (1.4) Graph the Functions Listed in the Library of Functions

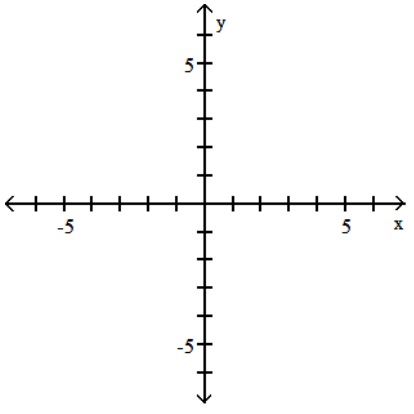
181)

A) cube root function
B) square function
C) square root function
D) cube function

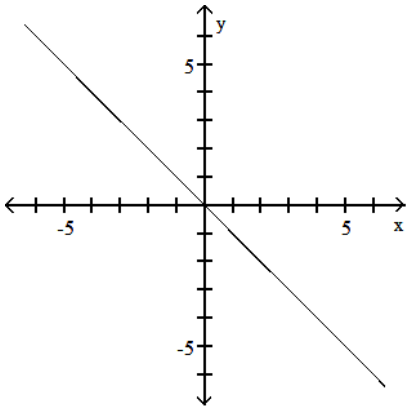
Objective: (1.4) Graph the Functions Listed in the Library of Functions

Graph the function.

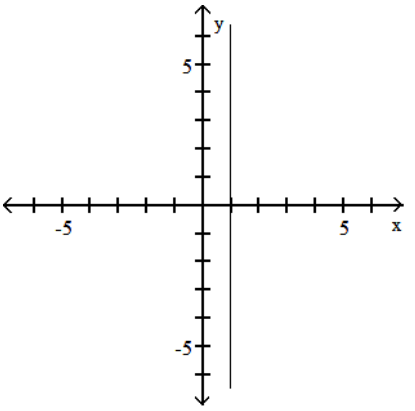
182) f(x) = x



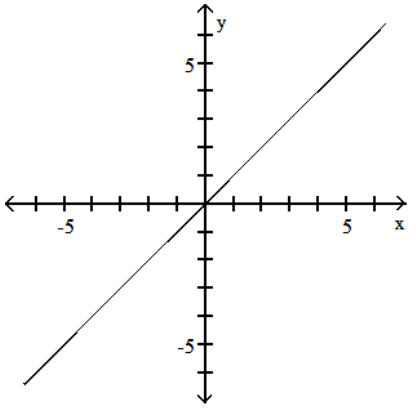
A)



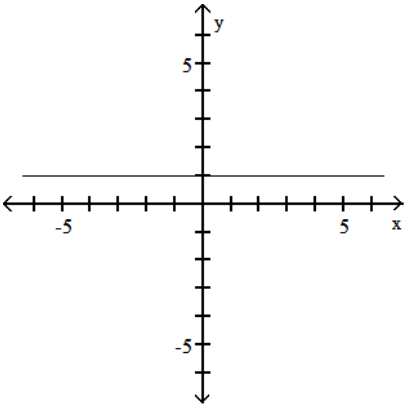
B)



C)

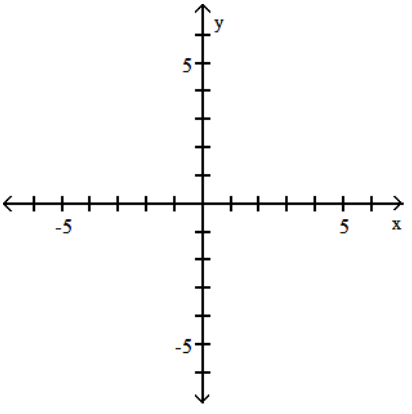


D)

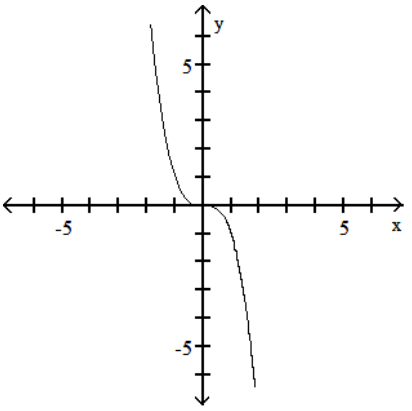


Objective: (1.4) Graph the Functions Listed in the Library of Functions

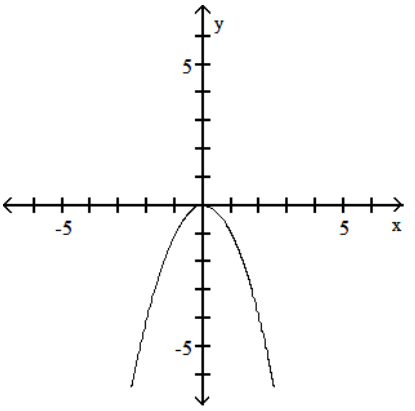
183) $f(x) = x^2$



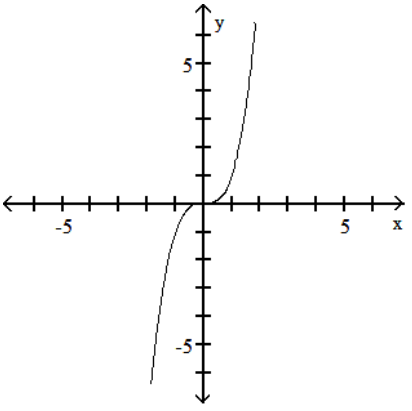
A)



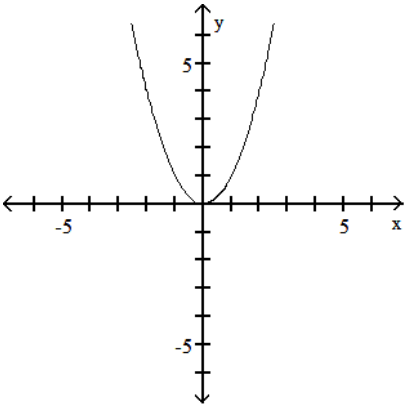
B)



C)

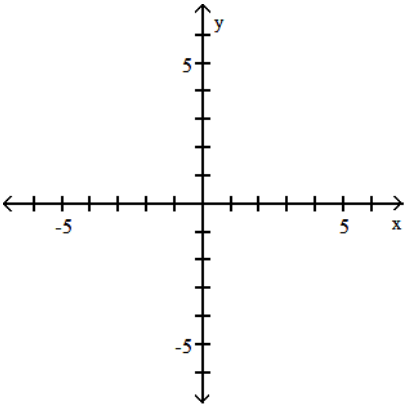


D)

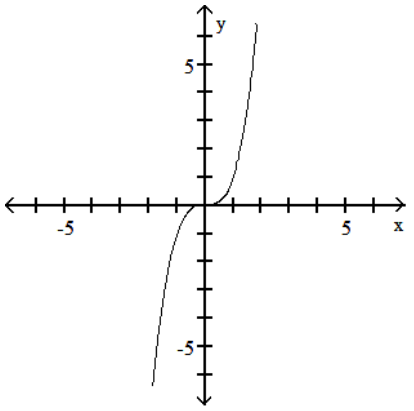


Objective: (1.4) Graph the Functions Listed in the Library of Functions

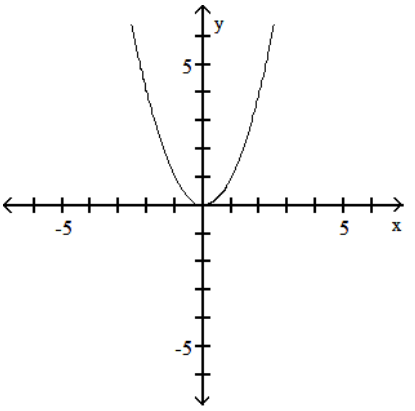
184) $f(x) = x^3$



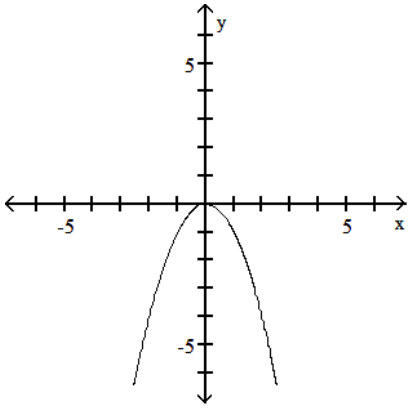
A)



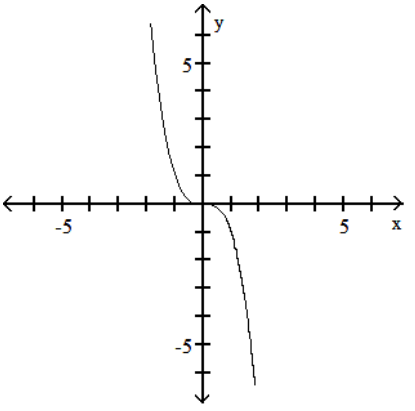
B)



C)

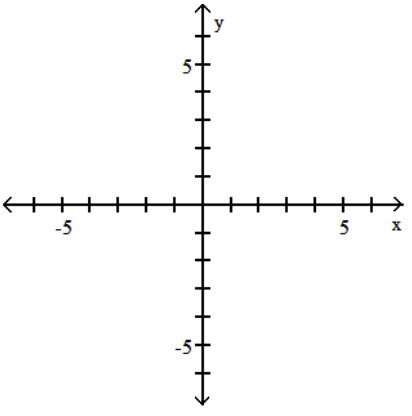


D)

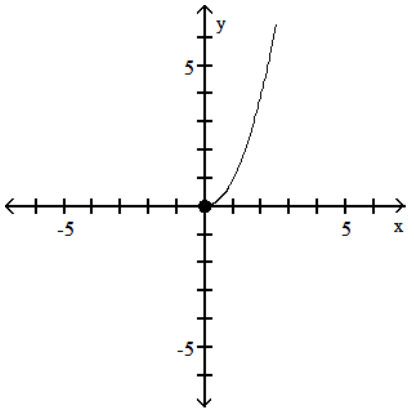


Objective: (1.4) Graph the Functions Listed in the Library of Functions

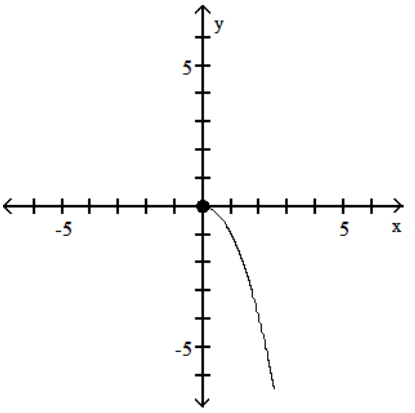
185) $f(x) = \sqrt{x}$



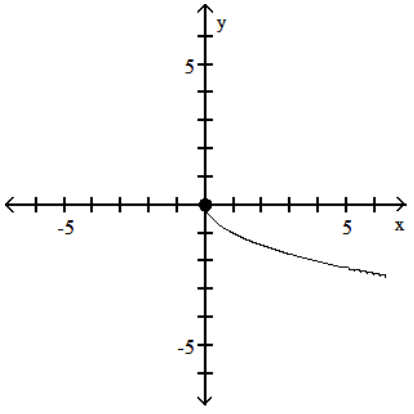
A)



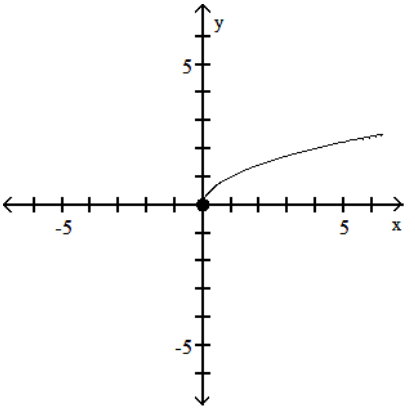
B)



C)

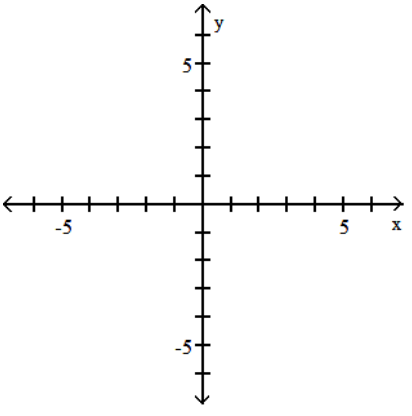


D)

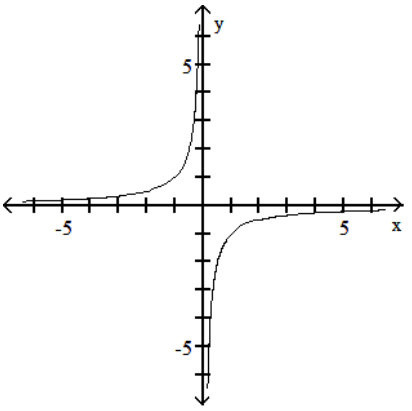


Objective: (1.4) Graph the Functions Listed in the Library of Functions

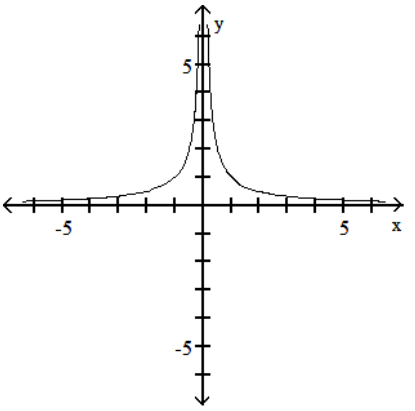
186) $f(x) = \frac{1}{x}$



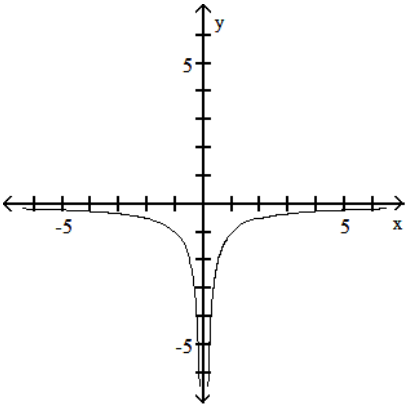
A)



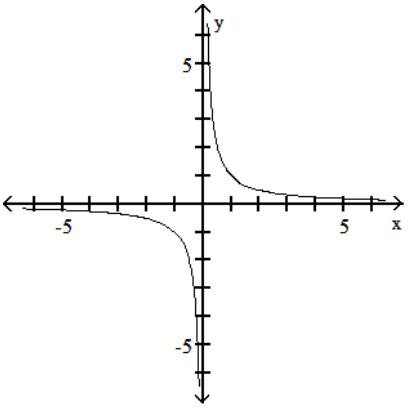
B)



C)

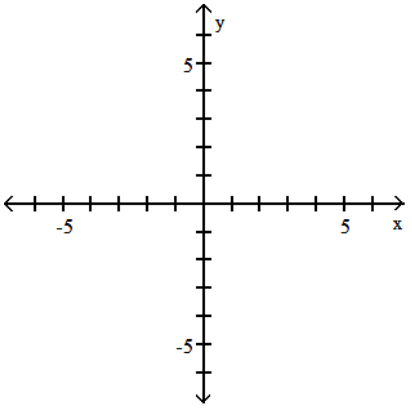


D)

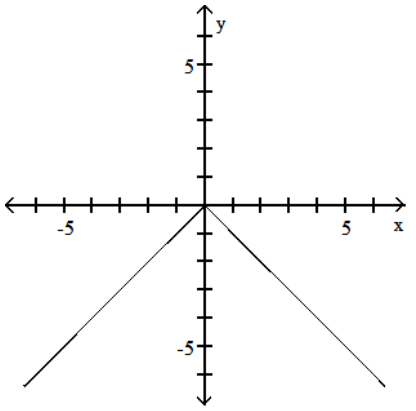


Objective: (1.4) Graph the Functions Listed in the Library of Functions

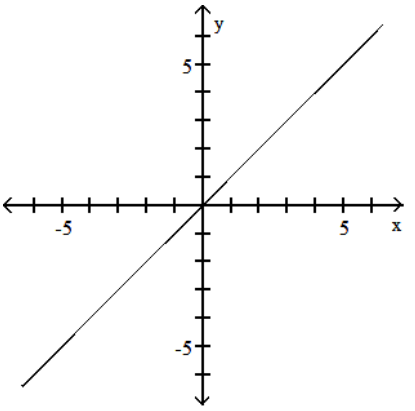
187) $f(x) = |x|$



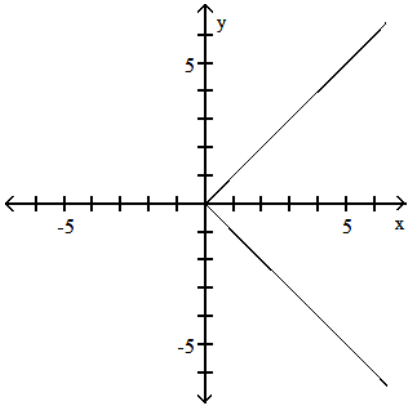
A)



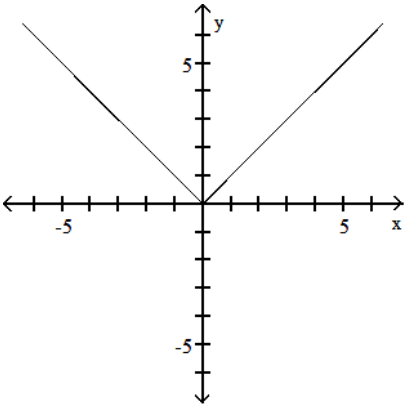
B)



C)

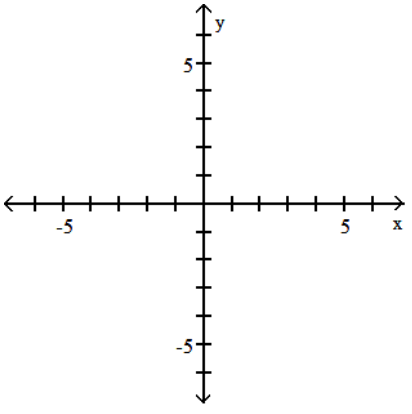


D)

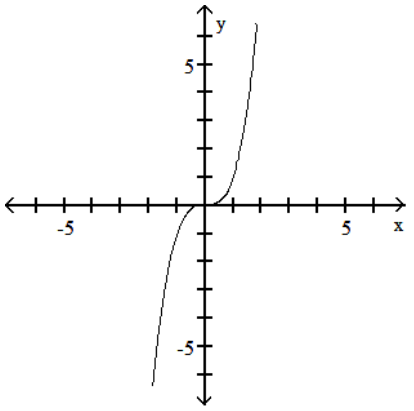


Objective: (1.4) Graph the Functions Listed in the Library of Functions

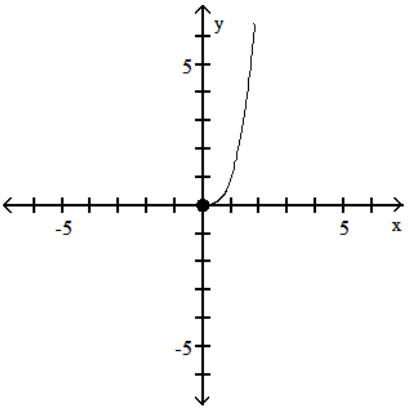
188) $f(x) = \sqrt[3]{x}$



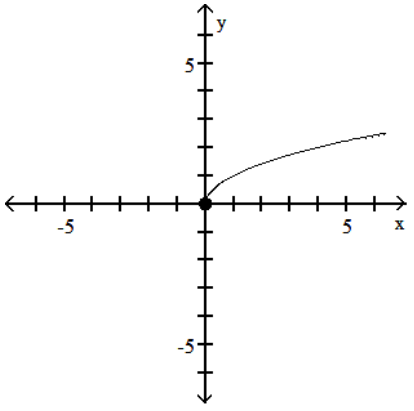
A)



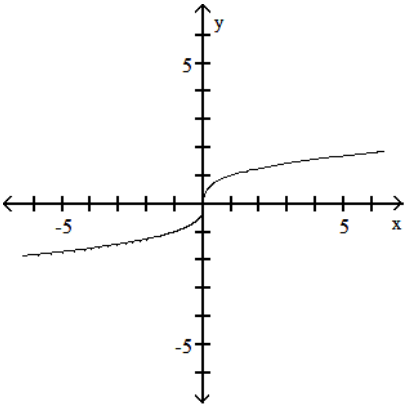
B)



C)

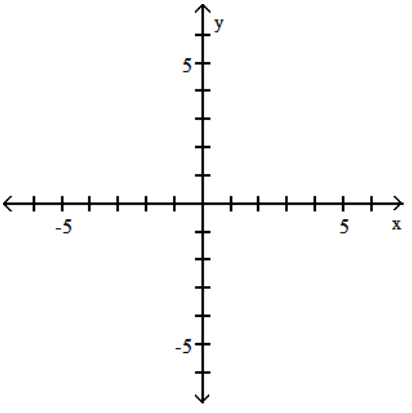


D)

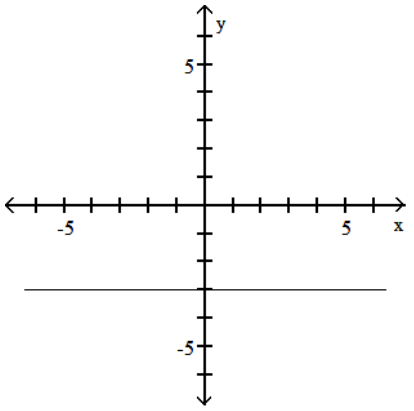


Objective: (1.4) Graph the Functions Listed in the Library of Functions

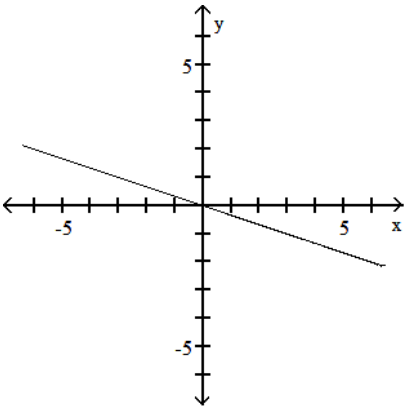
189) f(x) = −3



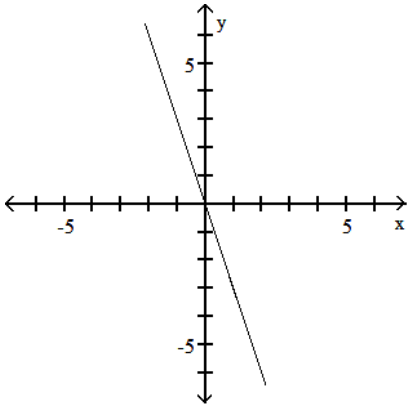
A)



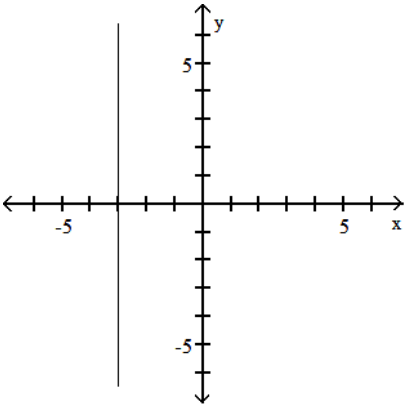
B)



C)



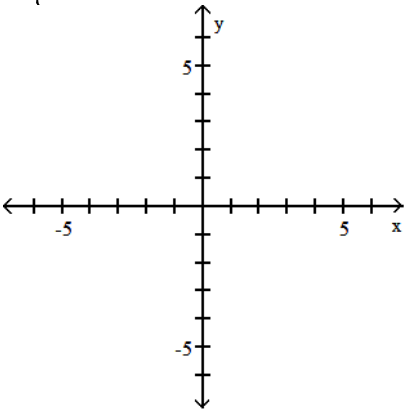
D)



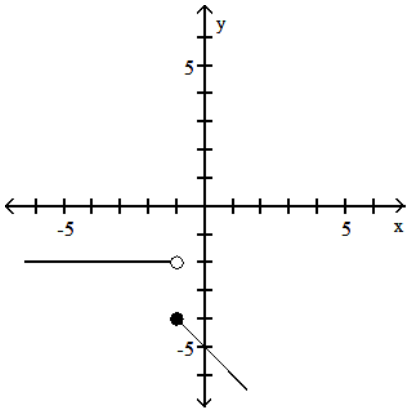
Objective: (1.4) Graph the Functions Listed in the Library of Functions

190)

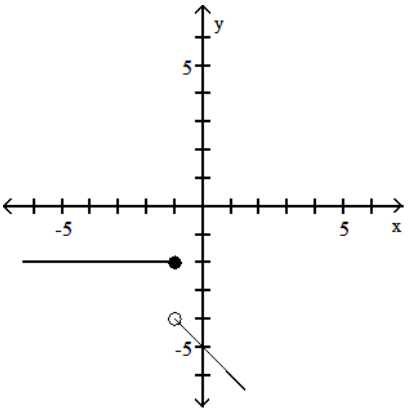
$$f(x) = \begin{cases} x - 5 & \text{if } x < 1 \\ -2 & \text{if } x \geq 1 \end{cases}$$



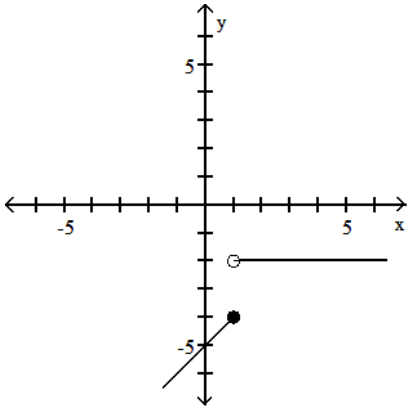
A)



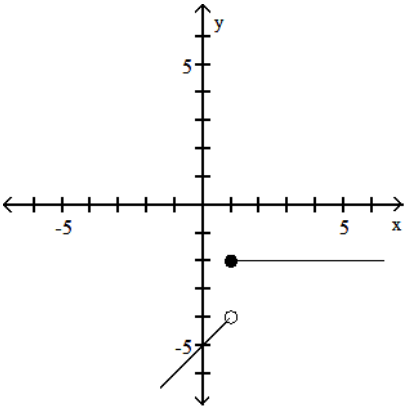
B)



C)



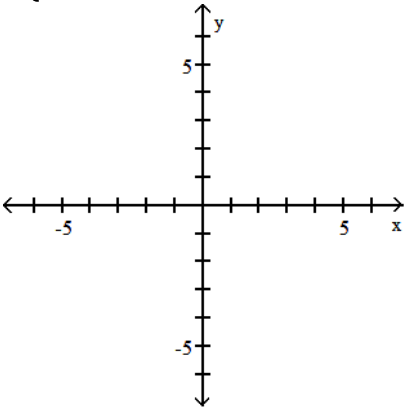
D)



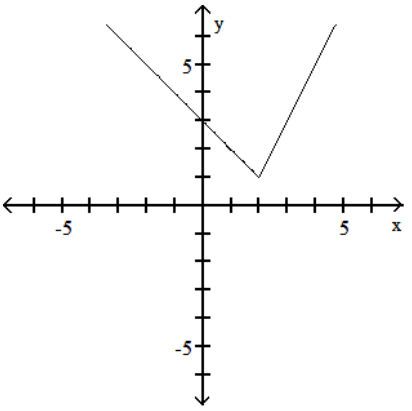
Objective: (1.4) Graph Piecewise-defined Functions

191)

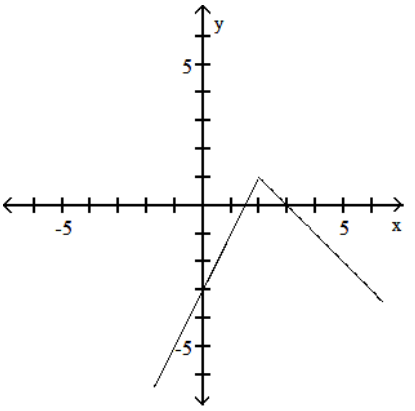
$$f(x) = \begin{cases} -x + 3 & \text{if } x < 2 \\ 2x - 3 & \text{if } x \geq 2 \end{cases}$$



A)



B)



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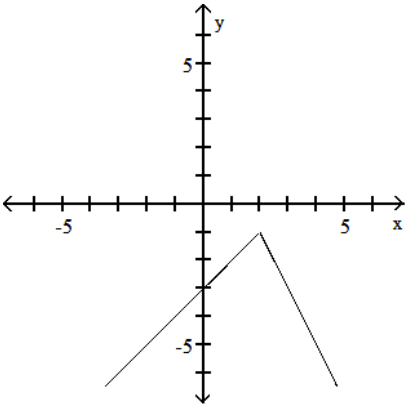
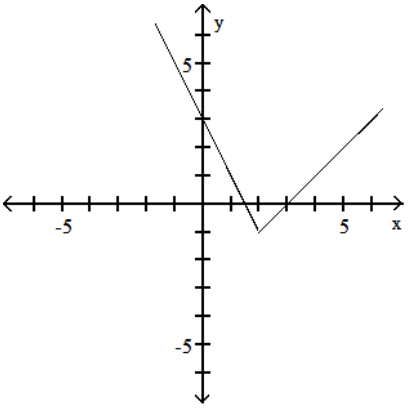


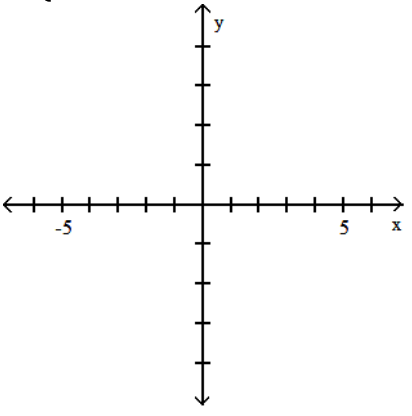
D)



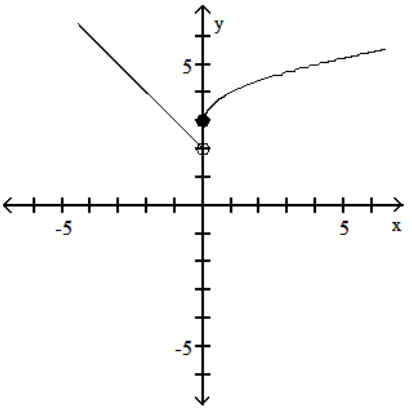
Objective: (1.4) Graph Piecewise-defined Functions

192)

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



A)



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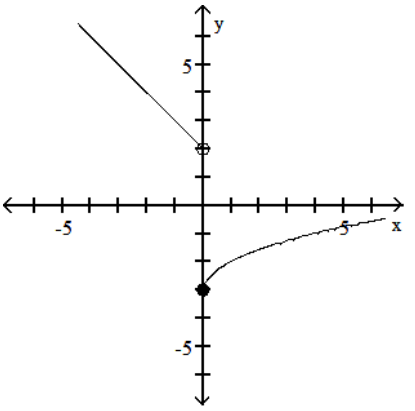

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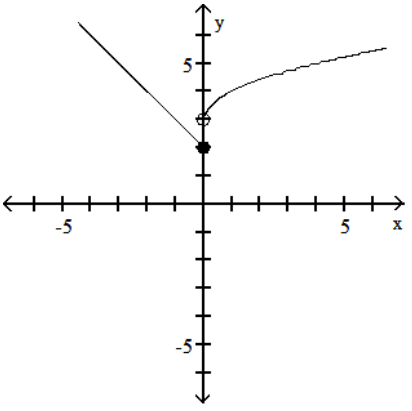
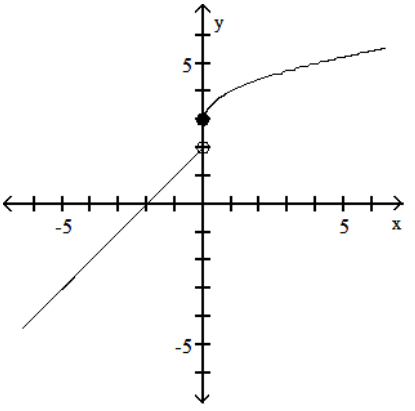


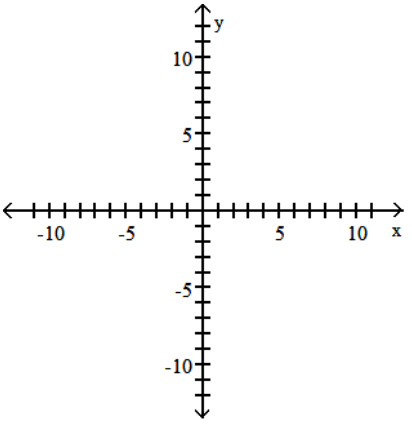
D)



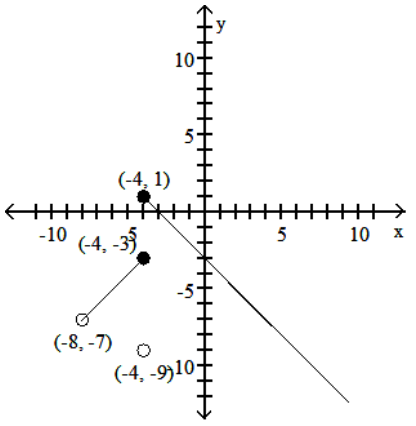
Objective: (1.4) Graph Piecewise-defined Functions

193)

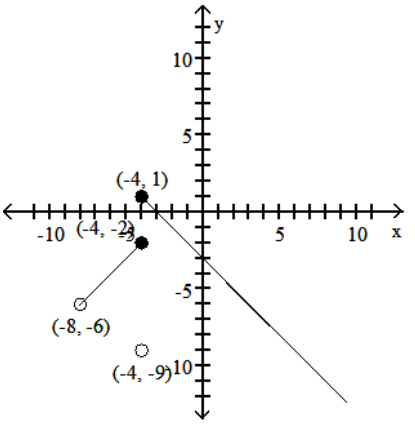
$$f(x) = \begin{cases} x + 1 & \text{if } -8 \le x < -4 \\ -9 & \text{if } x = -4 \\ -x - 3 & \text{if } x > -4 \end{cases}$$



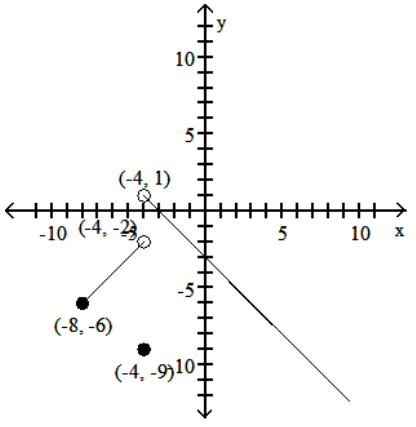
A)



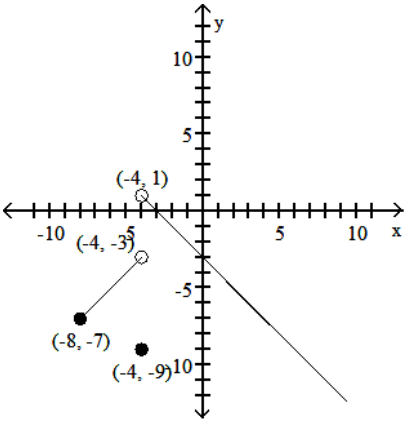
B)



C)



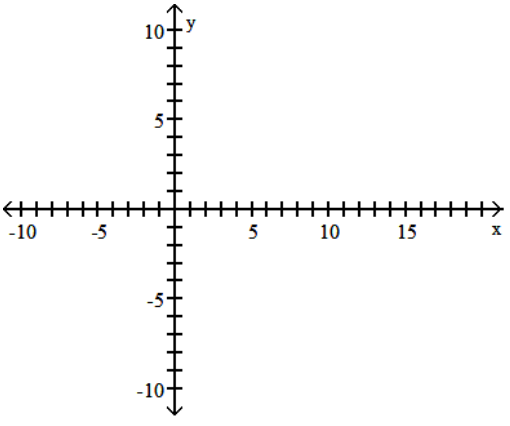
D)



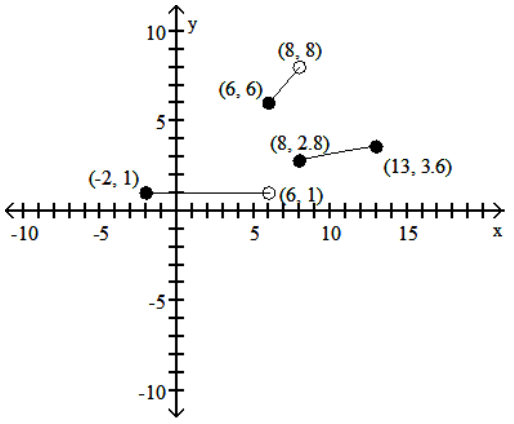
Objective: (1.4) Graph Piecewise-defined Functions

194)

$$f(x) = \begin{cases} 1 & \text{if } -2 \le x < 6 \\ |x| & \text{if } 6 \le x < 8 \\ \sqrt{x} & \text{if } 8 \le x \le 13 \end{cases}$$



A)



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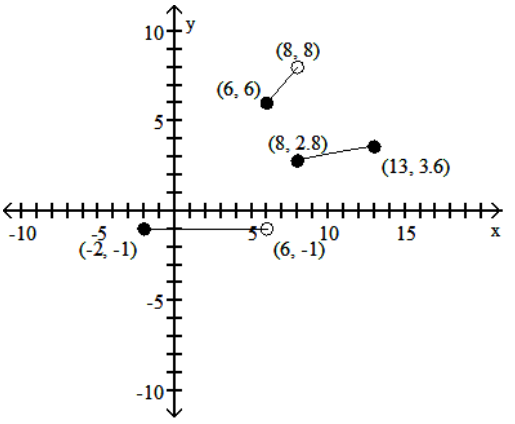
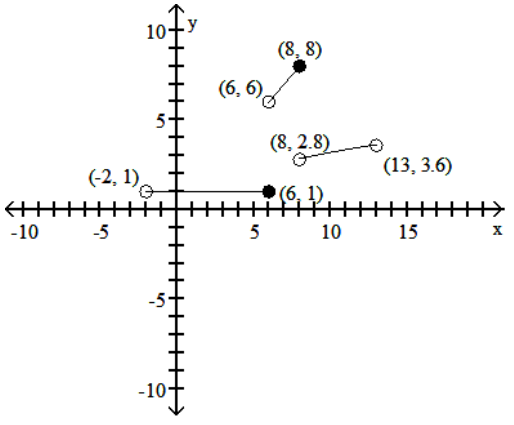
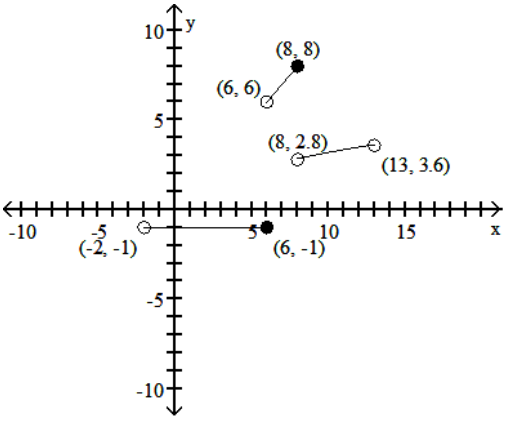


C)



D)



Objective: (1.4) Graph Piecewise-defined Functions

Find the domain of the function.

195)

$$f(x) = \begin{cases} -4x & \text{if } x \neq 0 \\ -3 & \text{if } x = 0 \end{cases}$$

A) $\{x \mid x \neq 0\}$ B) all real numbers C) $\{x \mid x \leq 0\}$ D) $\{0\}$

Objective: (1.4) Graph Piecewise-defined Functions

196)

$$f(x) = \begin{cases} 1 & \text{if } -4 \leq x < -3 \\ |x| & \text{if } -3 \leq x < 4 \\ \sqrt[3]{x} & \text{if } 4 \leq x \leq 26 \end{cases}$$

A) $\{x \mid -4 \leq x < 4 \text{ or } 4 < x \leq 26\}$ B) $\{x \mid -4 \leq x \leq 26\}$

C) $\{x \mid x \geq -4\}$ D) $\{x \mid 4 \leq x \leq 26\}$

Objective: (1.4) Graph Piecewise-defined Functions

Locate any intercepts of the function.

197)

$$f(x) = \begin{cases} -5x + 9 & \text{if } x < 1 \\ 9x - 5 & \text{if } x \geq 1 \end{cases}$$

A) $(0, -5), (\frac{9}{5}, 0), (\frac{5}{9}, 0)$ B) $(0, 9)$ C) $(0, 9), (\frac{9}{5}, 0), (\frac{5}{9}, 0)$ D) $(0, -5)$

Objective: (1.4) Graph Piecewise-defined Functions

198)

$$f(x) = \begin{cases} 1 & \text{if } -7 \leq x < -4 \\ |x| & \text{if } -4 \leq x < 7 \\ \sqrt{x} & \text{if } 7 \leq x \leq 24 \end{cases}$$

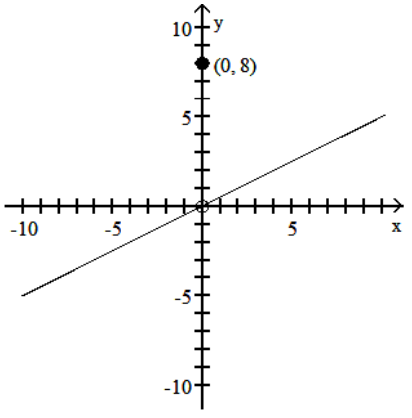
A) $(0, 0), (1, 0)$ B) $(0, 0)$ C) $(0, 0), (0, 1)$ D) none

Objective: (1.4) Graph Piecewise-defined Functions

Based on the graph, find the range of y = f(x).

199)

$$f(x) = \begin{cases} \frac{1}{2}x & \text{if } x \neq 0 \\ 8 & \text{if } x = 0 \end{cases}$$

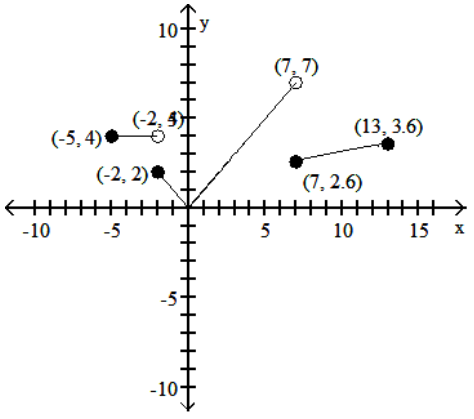


A) $(-\infty, 0)$ or $\{0\}$ or $(0, \infty)$
B) $(-10, 10)$
C) $(-\infty, \infty)$
D) $(-\infty, 0)$ or $(0, \infty)$

Objective: (1.4) Graph Piecewise-defined Functions

200)

$$f(x) = \begin{cases} 4 & \text{if } -5 \le x < -2 \\ |x| & \text{if } -2 \le x < 7 \\ \sqrt{x} & \text{if } 7 \le x \le 13 \end{cases}$$

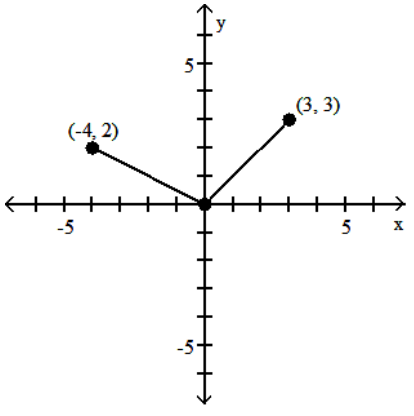


A) $[0, \sqrt{13}]$ B) $[0, 7)$ C) $[0, \infty)$ D) $[0, 7]$

Objective: (1.4) Graph Piecewise-defined Functions

The graph of a piecewise-defined function is given. Write a definition for the function.

201)



A)

$$f(x) = \begin{cases} -\frac{1}{2}x & \text{if } -4 < x < 0 \\ x & \text{if } 0 < x < 3 \end{cases}$$

B)

$$f(x) = \begin{cases} \frac{1}{2}x & \text{if } -4 < x < 0 \\ x & \text{if } 0 < x < 3 \end{cases}$$

C)

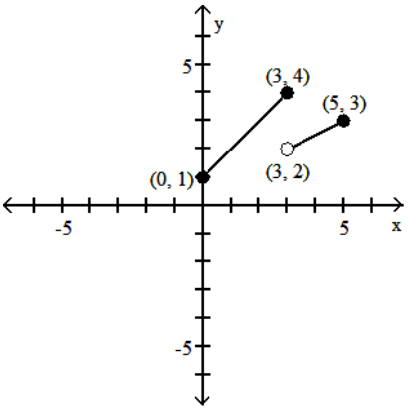
$$f(x) = \begin{cases} -2x & \text{if } -4 \le x \le 0 \\ x & \text{if } 0 < x \le 3 \end{cases}$$

D)

$$f(x) = \begin{cases} -\frac{1}{2}x & \text{if } -4 \le x \le 0 \\ x & \text{if } 0 < x \le 3 \end{cases}$$

Objective: (1.4) Graph Piecewise-defined Functions

202)



A)
$$f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x + \frac{1}{2} & \text{if } 3 < x \le 5 \end{cases}$$

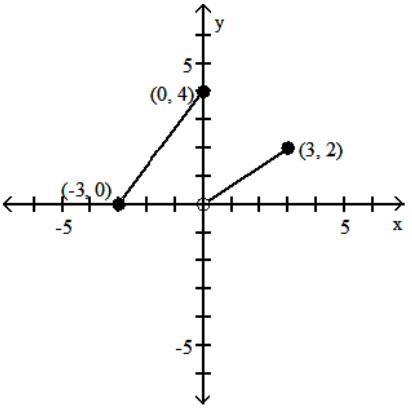
B)
$$f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x + 2 & \text{if } 3 < x \le 5 \end{cases}$$

C)
$$f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x & \text{if } 3 < x \le 5 \end{cases}$$

D)
$$f(x) = \begin{cases} x + 1 & \text{if } 0 \le x \le 3 \\ \frac{1}{2}x - \frac{1}{2} & \text{if } 3 < x \le 5 \end{cases}$$

Objective: (1.4) Graph Piecewise-defined Functions

203)



A)
$$f(x) = \begin{cases} \frac{4}{3}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{2}{3}x & \text{if } 0 < x \le 3 \end{cases}$$

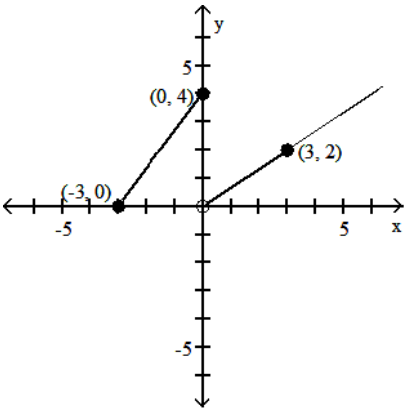
B)
$$f(x) = \begin{cases} \frac{4}{3}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{2}{3}x + 2 & \text{if } 0 < x \le 3 \end{cases}$$

C)
$$f(x) = \begin{cases} \frac{4}{3}x - 4 & \text{if } -3 \le x \le 0 \\ \frac{2}{3}x & \text{if } 0 \le x \le 3 \end{cases}$$

D)
$$f(x) = \begin{cases} \frac{3}{4}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{3}{2}x & \text{if } 0 < x \le 3 \end{cases}$$

Objective: (1.4) Graph Piecewise-defined Functions

204)



A)
$$f(x) = \begin{cases} \frac{3}{4}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{3}{2}x & \text{if } x > 0 \end{cases}$$

B)
$$f(x) = \begin{cases} \frac{4}{3}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{2}{3}x & \text{if } x > 0 \end{cases}$$

C)
$$f(x) = \begin{cases} \frac{3}{4}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{3}{2}x & \text{if } x \ge 0 \end{cases}$$

D)
$$f(x) = \begin{cases} \frac{4}{3}x + 4 & \text{if } -3 \le x \le 0 \\ \frac{2}{3}x & \text{if } 0 < x \le 3 \end{cases}$$

Objective: (1.4) Graph Piecewise-defined Functions

Solve the problem.

205) If f(x) = int(2x), find f(1.8).

A) 3 B) 2 C) 4 D) 1

Objective: (1.4) Graph Piecewise-defined Functions

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

206) A gas company has the following rate schedule for natural gas usage in single-family residences:

Monthly service charge	$8.80
Per therm service charge	
1st 25 therms	$0.6686/therm
Over 25 therms	$0.85870/therm

What is the charge for using 25 therms in one month?
What is the charge for using 45 therms in one month?
Construct a function that gives the monthly charge C for x therms of gas.

Objective: (1.4) Graph Piecewise-defined Functions

207) An electric company has the following rate schedule for electricity usage in single–family residences:

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: (1.4) Graph Piecewise–defined Functions

208) One Internet service provider has the following rate schedule for high–speed Internet service:

Monthly service charge	$18.00
1st 50 hours of use	free
Next 50 hours of use	$0.25/hour
Over 100 hours of use	$1.00/hour

What is the charge for 50 hours of high–speed Internet use in one month?
What is the charge for 75 hours of high–speed Internet use in one month?
What is the charge for 135 hours of high–speed Internet use in one month?

Objective: (1.4) Graph Piecewise–defined Functions

209) The wind chill factor represents the equivalent air temperature at a standard wind speed that would produce the same heat loss as the given temperature and wind speed. One formula for computing the equivalent temperature is

$$W(t) = \begin{cases} t & \text{if } 0 \le v < 1.79 \\ 33 - \dfrac{(10.45 + 10\sqrt{v} - v)(33 - t)}{22.04} & \text{if } 1.79 \le v < 20 \\ 33 - 1.5958(33 - t) & \text{if } v \ge 20 \end{cases}$$

where v represents the wind speed (in meters per second) and t represents the air temperature (°C). Compute the wind chill for an air temperature of 15°C and a wind speed of 12 meters per second. (Round the answer to one decimal place.)

Objective: (1.4) Graph Piecewise–defined Functions

210) A cellular phone plan had the following schedule of charges:

Basic service, including 100 minutes of calls	$20.00 per month
2nd 100 minutes of calls	$0.075 per minute
Additional minutes of calls	$0.10 per minute

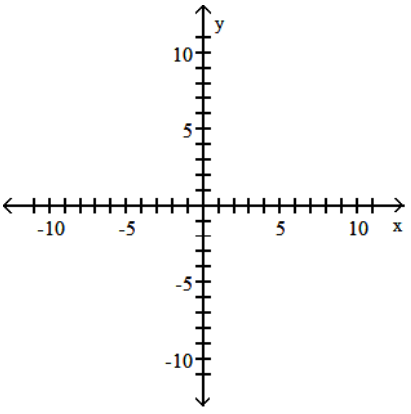
What is the charge for 200 minutes of calls in one month?
What is the charge for 250 minutes of calls in one month?
Construct a function that relates the monthly charge C for x minutes of calls.

Objective: (1.4) Graph Piecewise–defined Functions

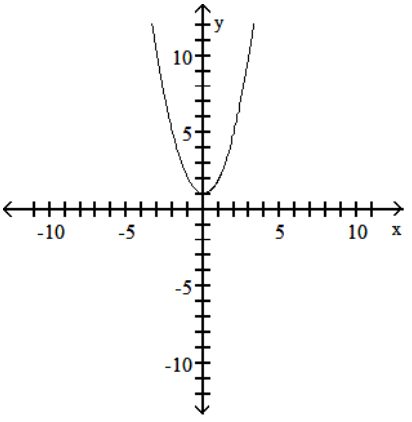
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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

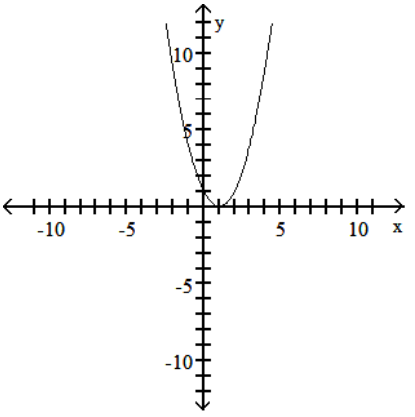
211) $f(x) = x^2 + 1$



A)



B)



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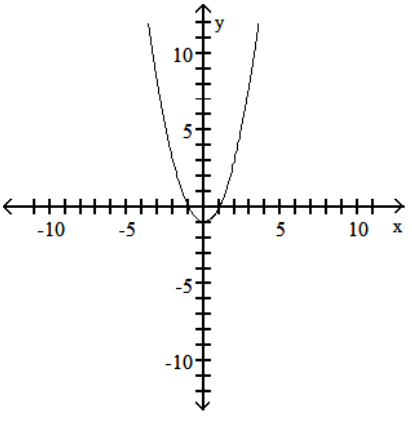
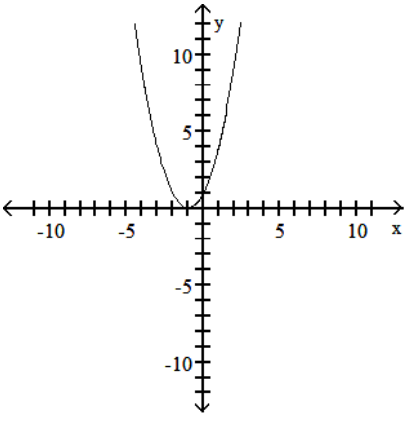
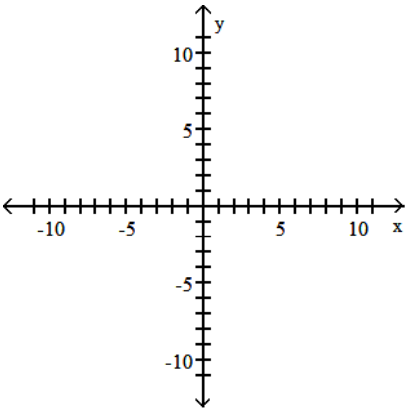


D)

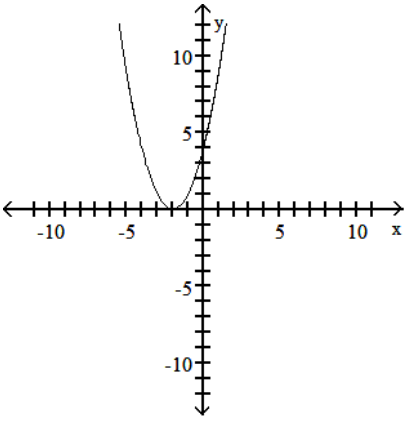


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

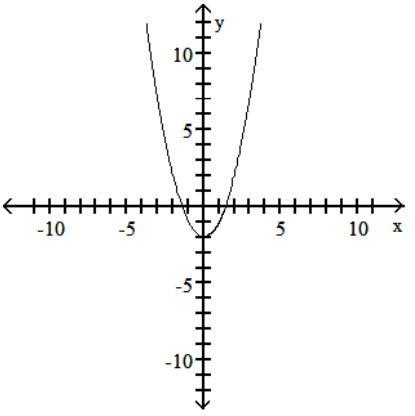
212) $f(x) = (x + 2)^2$



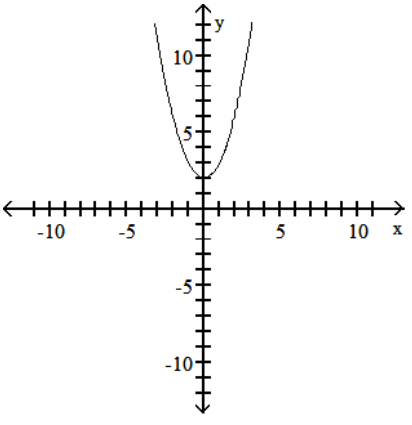
A)



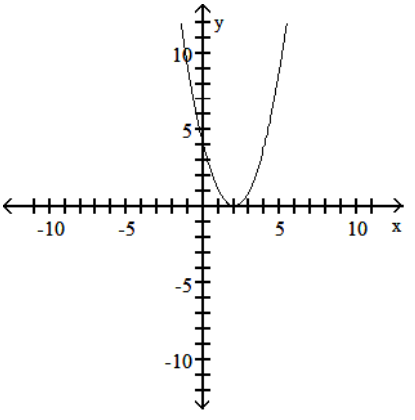
B)



C)

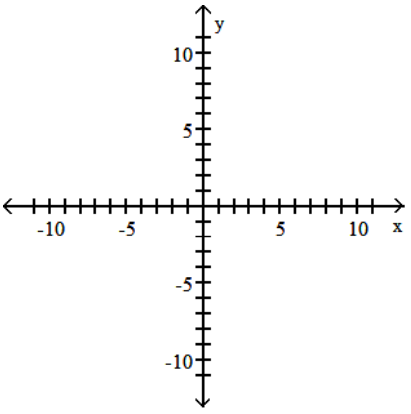


D)

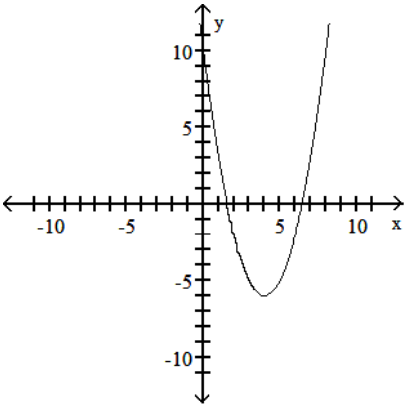


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

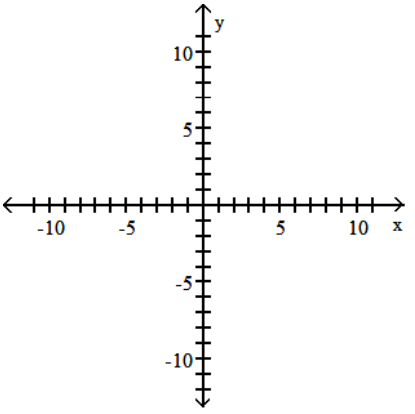
213) $f(x) = (x - 4)^2 - 6$



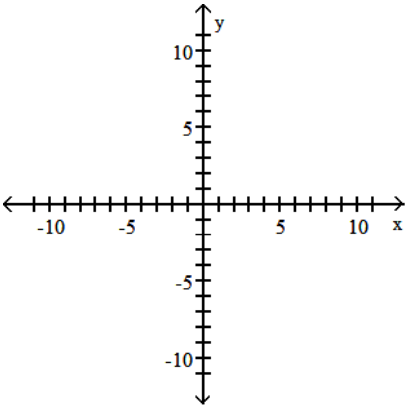
A)



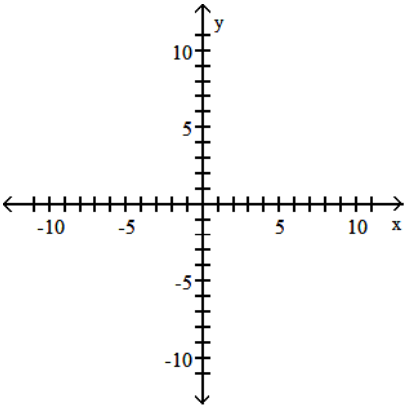
B)



C)

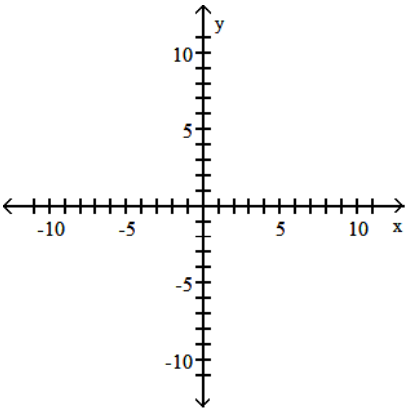


D)

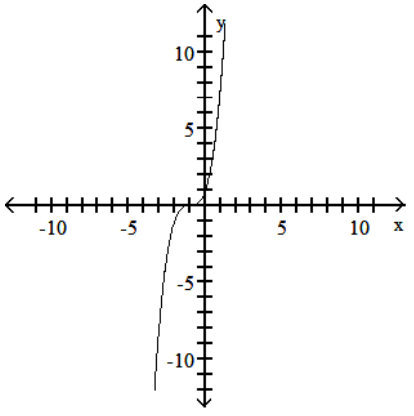


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

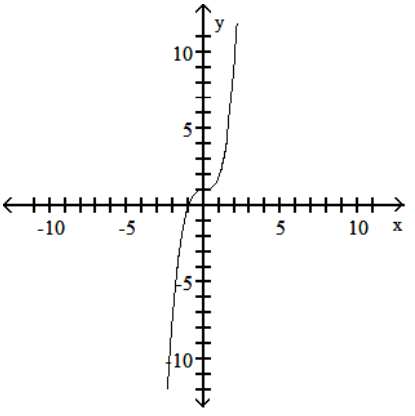
214) $f(x) = x^3 - 1$



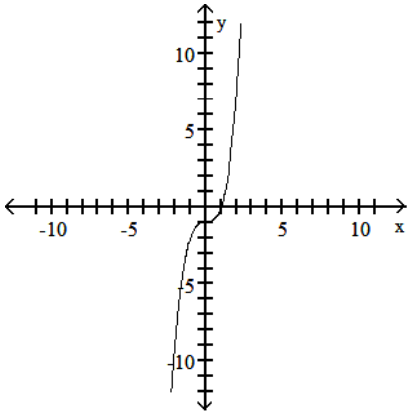
A)



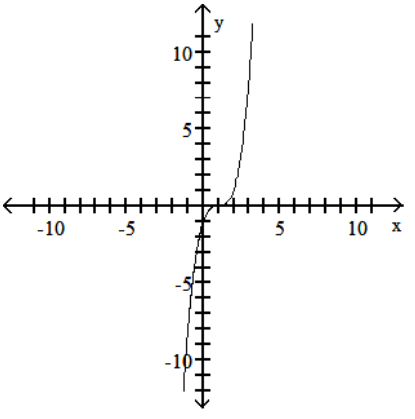
B)



C)

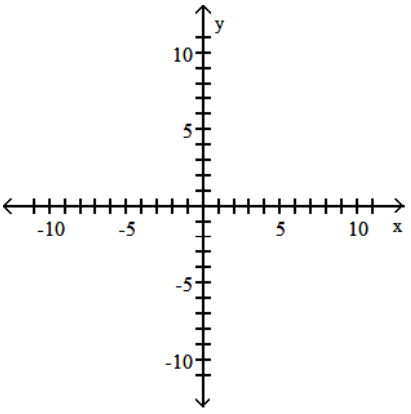


D)

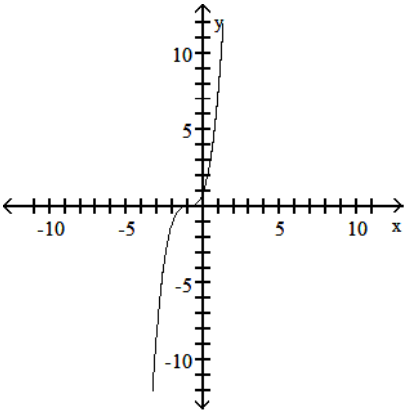


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

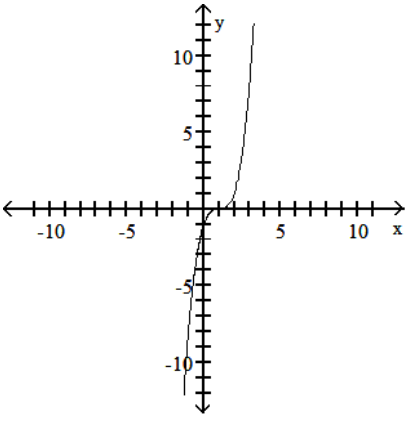
215) $f(x) = (x - 1)^3$



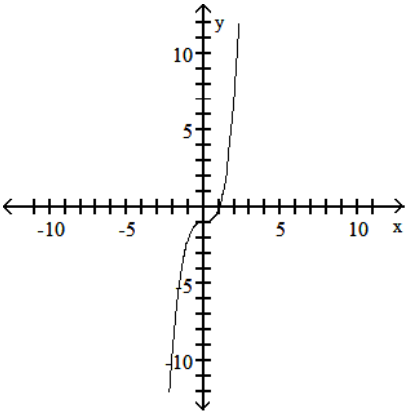
A)



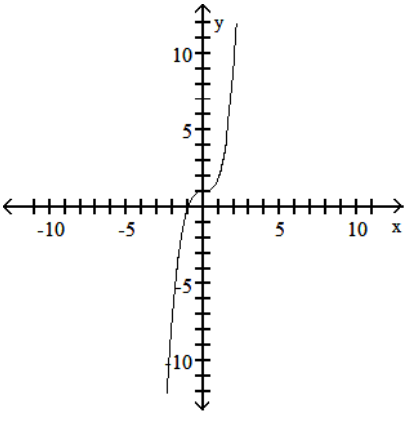
B)



C)

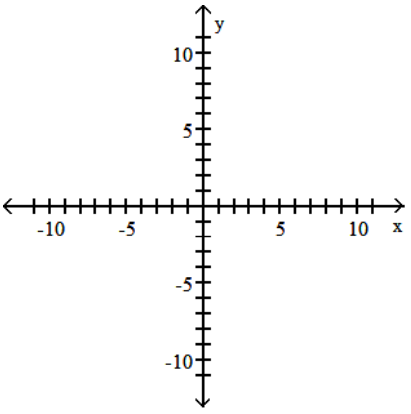


D)

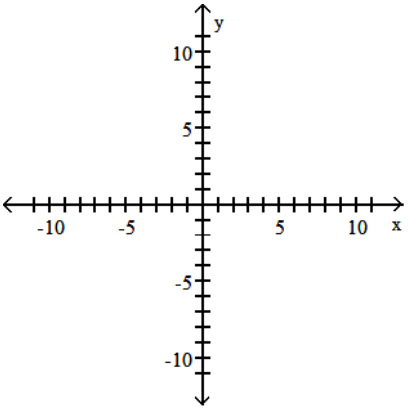


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

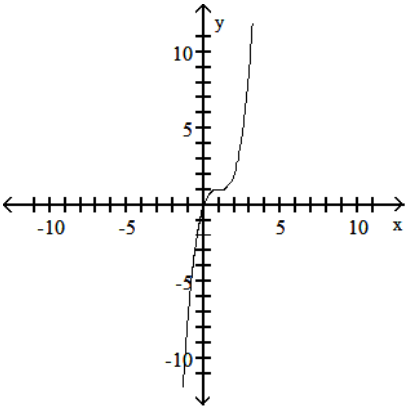
216) $f(x) = (x - 1)^3 + 1$



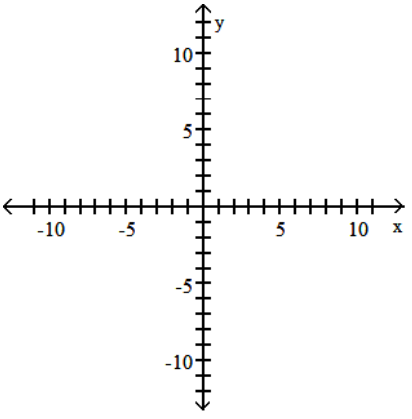
A)



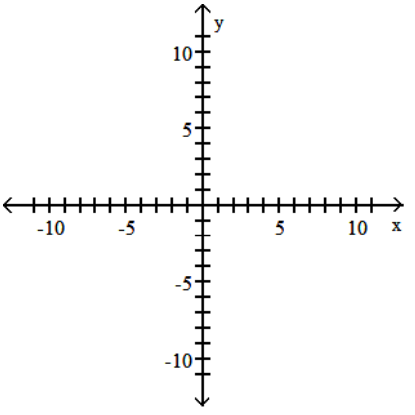
B)



C)

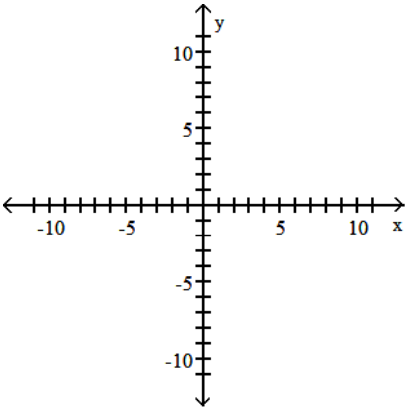


D)

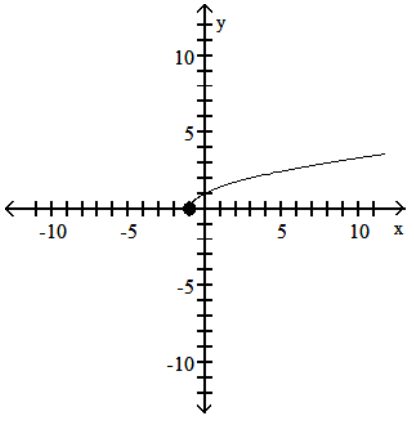


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

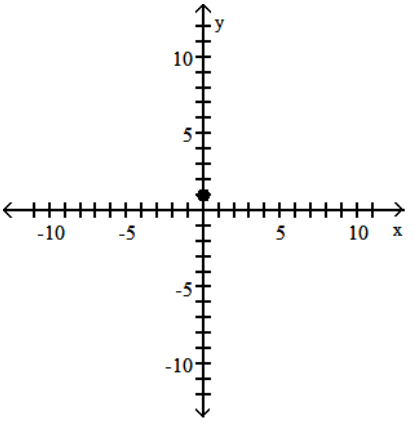
217) $f(x) = \sqrt{x} + 1$



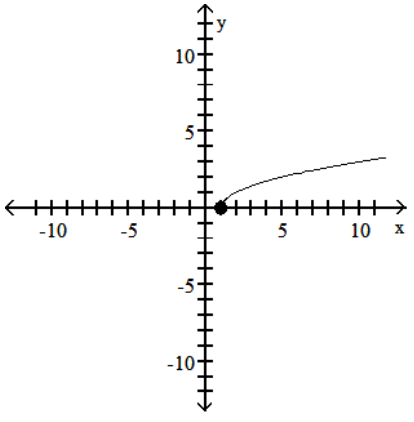
A)



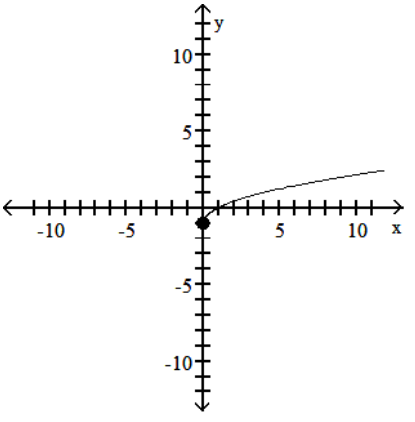
B)



C)

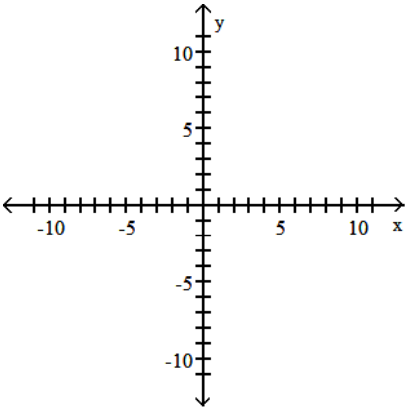


D)

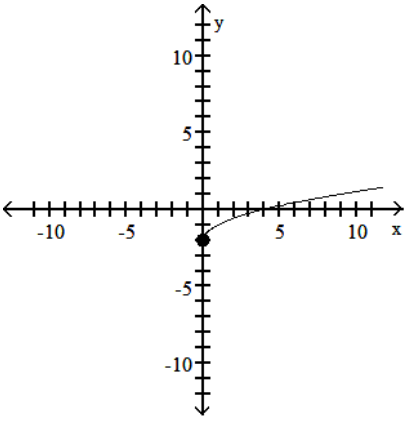


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

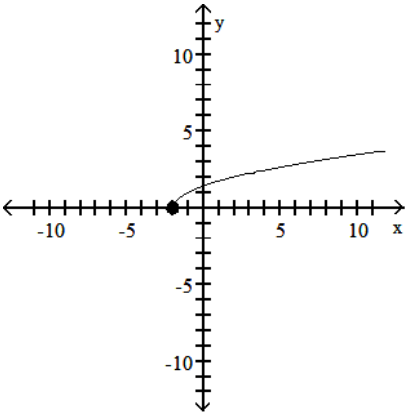
218) $f(x) = \sqrt{x - 2}$



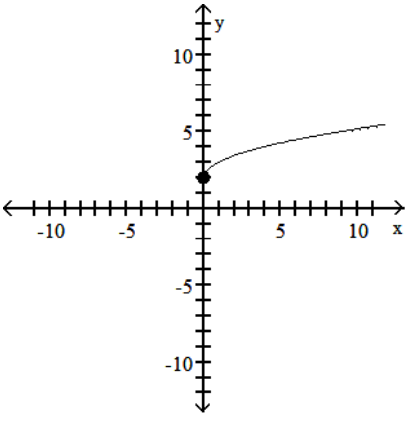
A)



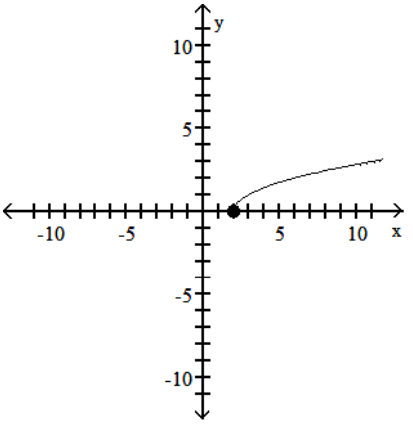
B)



C)

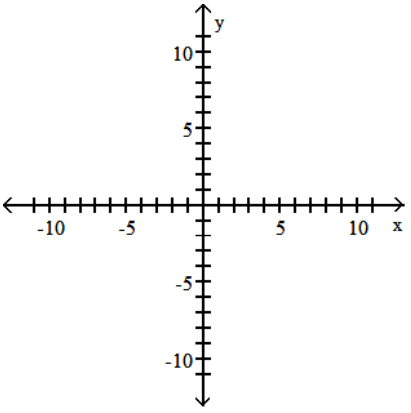


D)

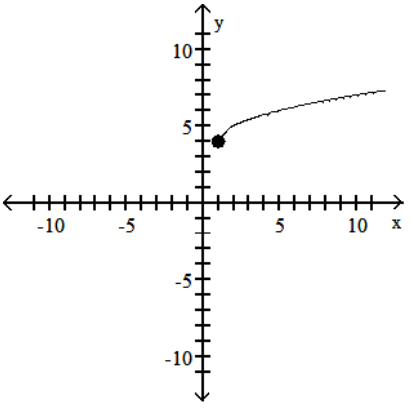


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

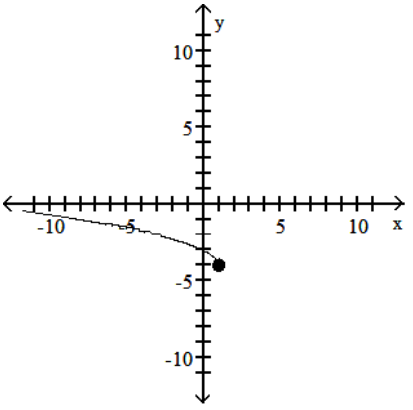
219) $f(x) = \sqrt{x - 1} + 4$



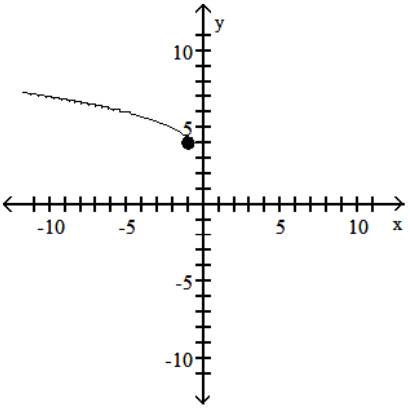
A)



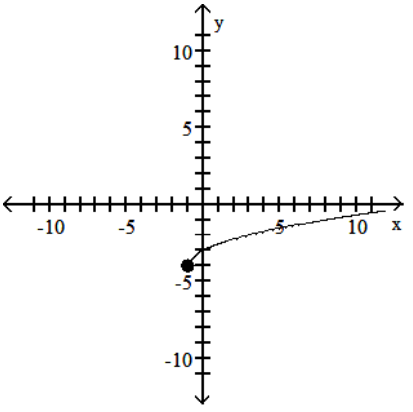
B)



C)

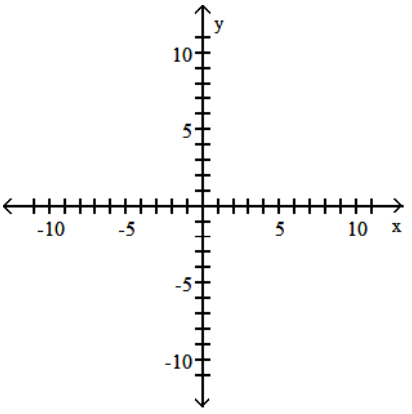


D)

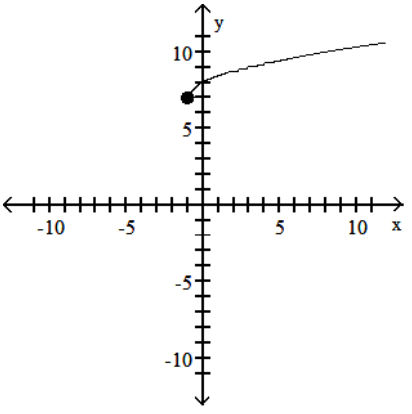


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

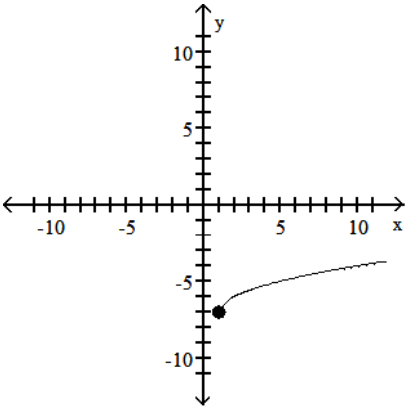
220) $f(x) = \sqrt{x - 1} - 7$



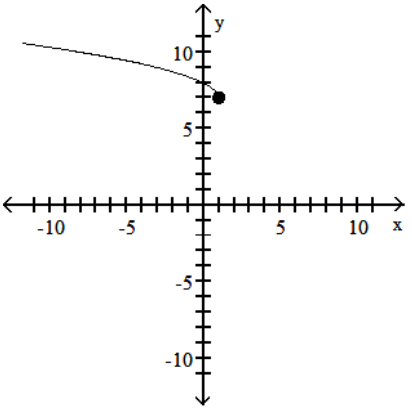
A)



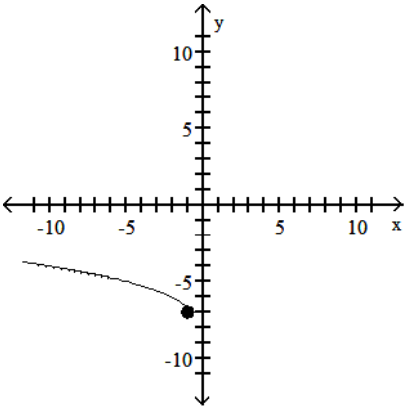
B)



C)

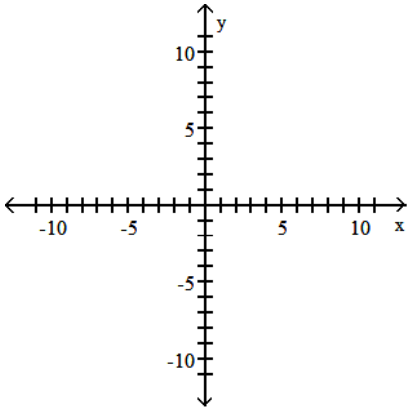


D)

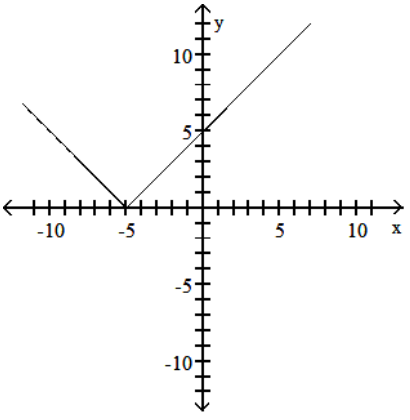


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

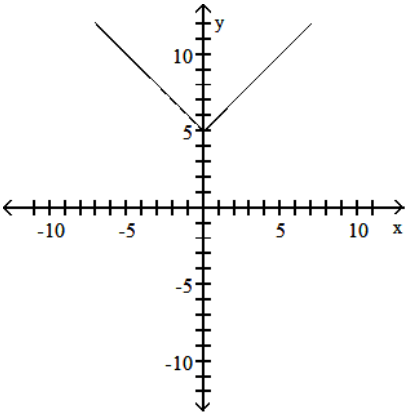
221) f(x) = |x| − 5



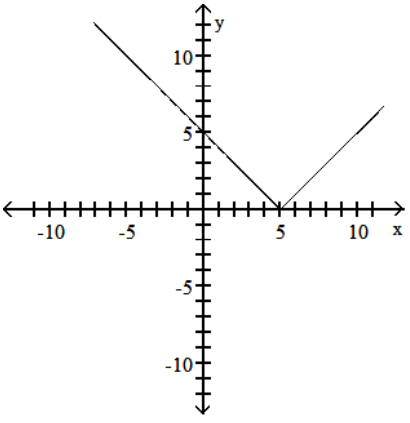
A)



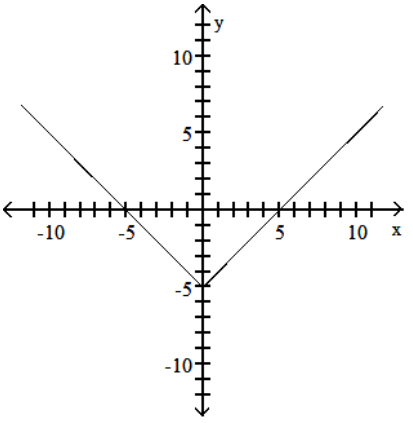
B)



C)

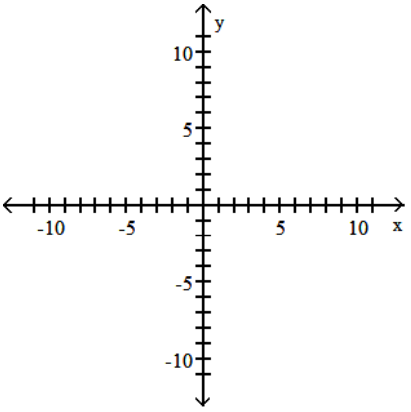


D)

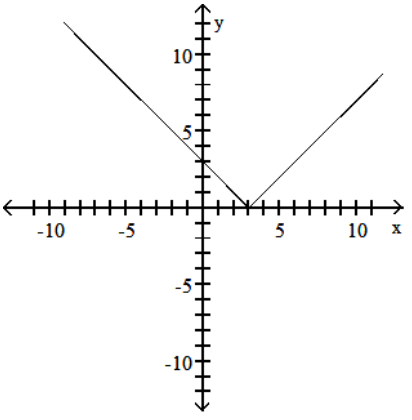


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

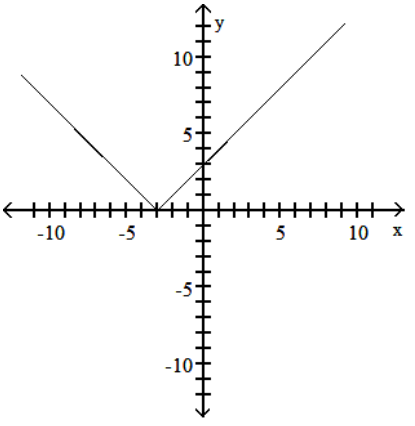
222) f(x) = |x + 3|



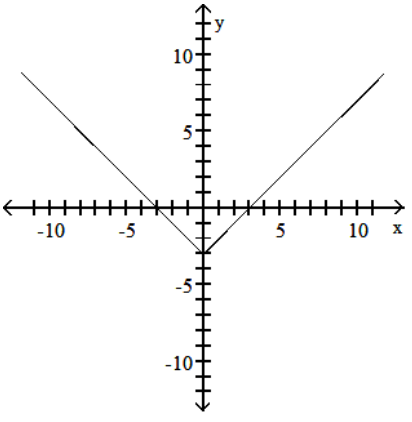
A)



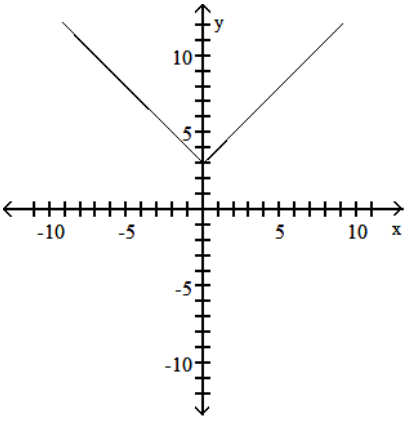
B)



C)

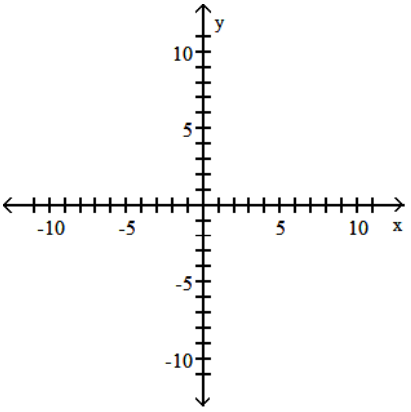


D)

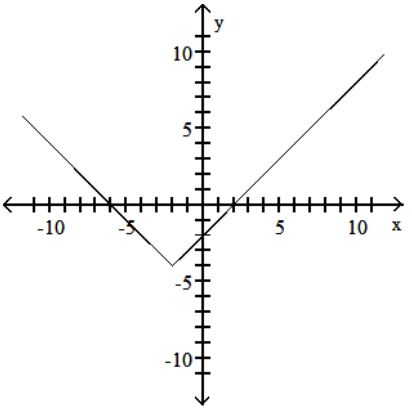


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

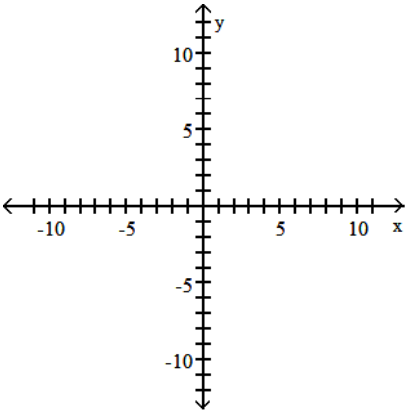
223) f(x) = |x + 2| − 4



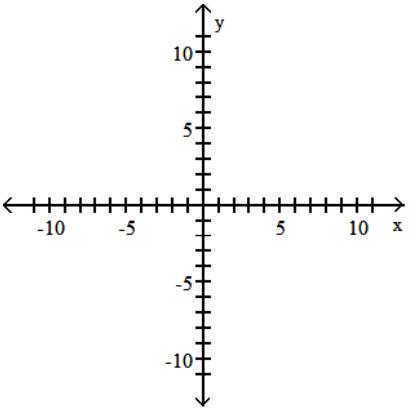
A)



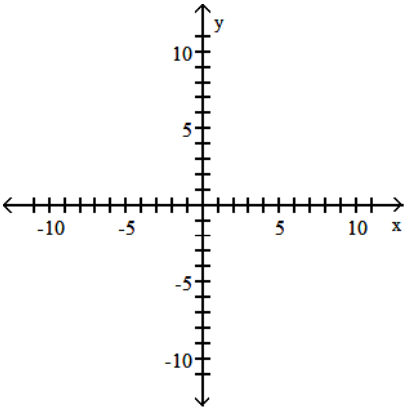
B)



C)

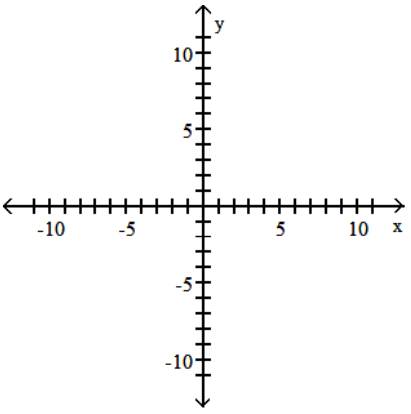


D)

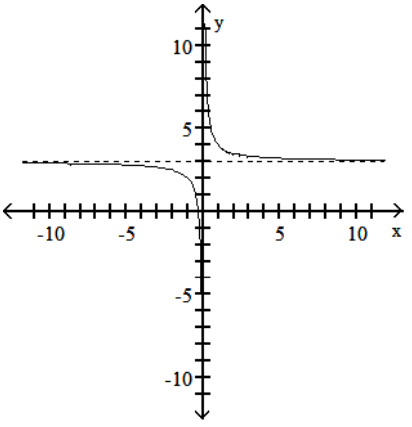


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

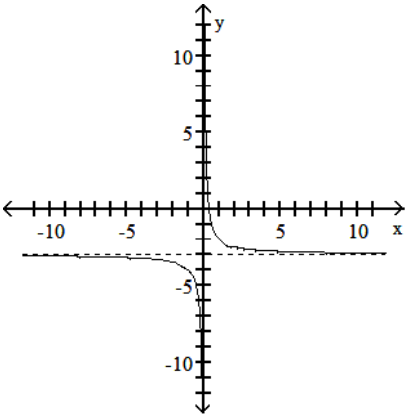
224) $f(x) = \frac{1}{x} + 3$



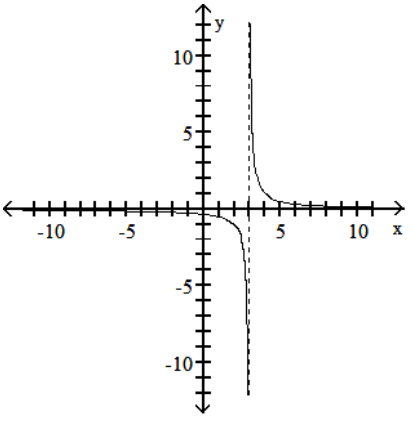
A)



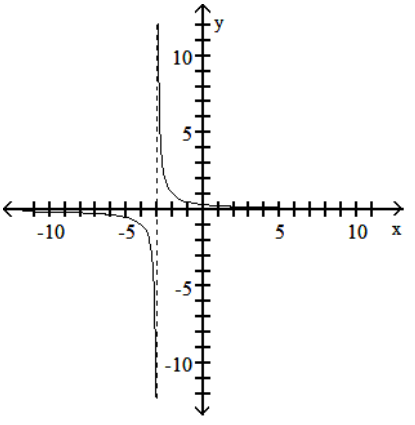
B)



C)

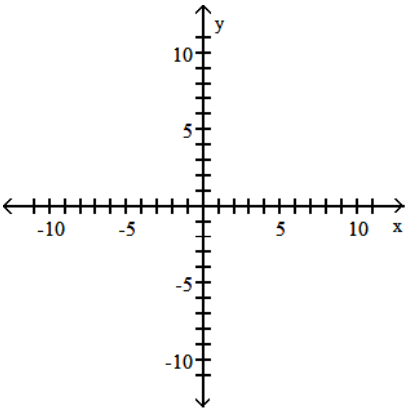


D)

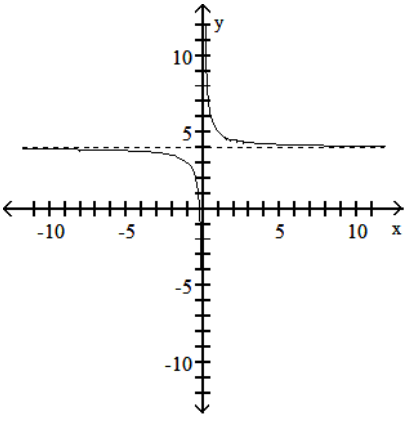


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

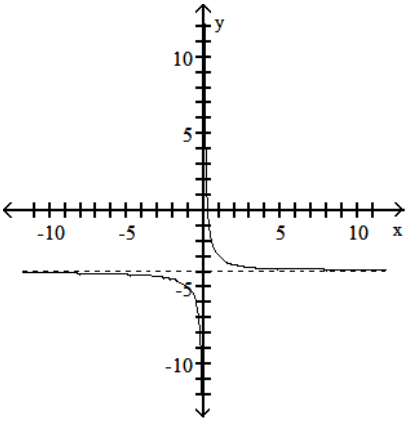
225) $f(x) = \dfrac{1}{x - 4}$



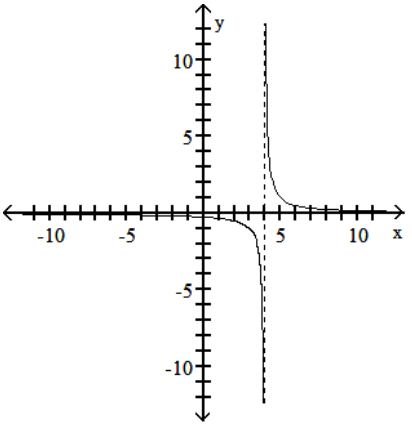
A)



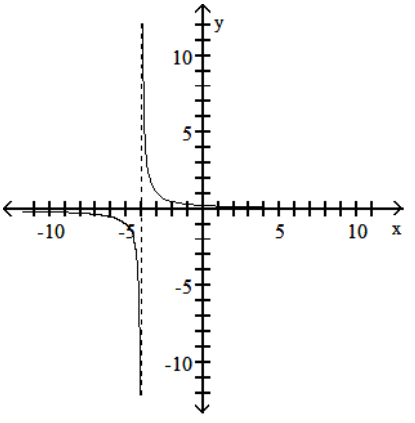
B)



C)

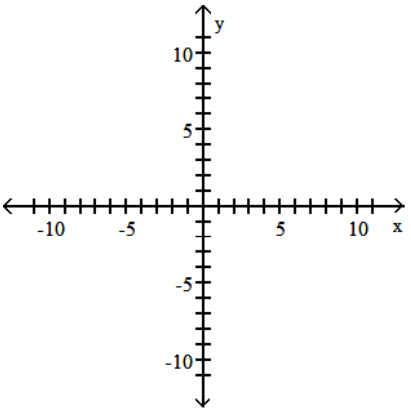


D)

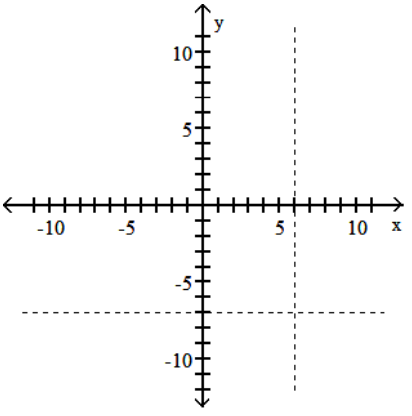


Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

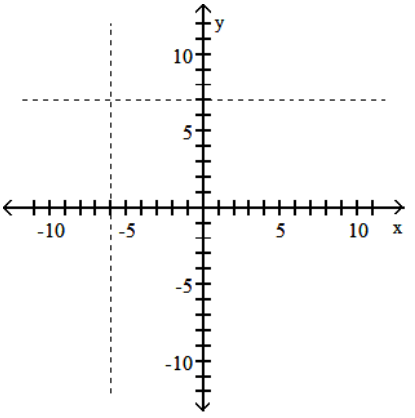
226) $f(x) = \dfrac{1}{x + 6} - 7$



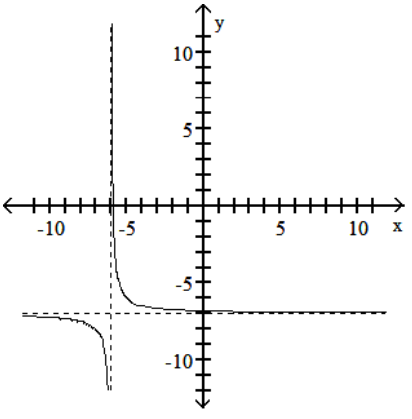
A)



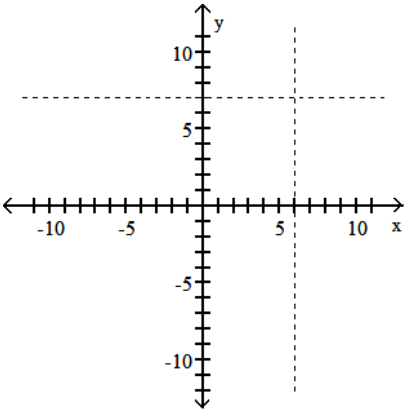
B)



C)



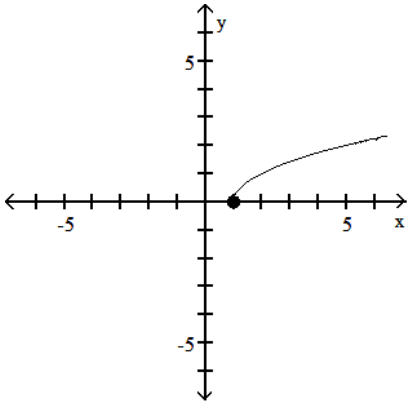
D)



Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

Match the correct function to the graph.

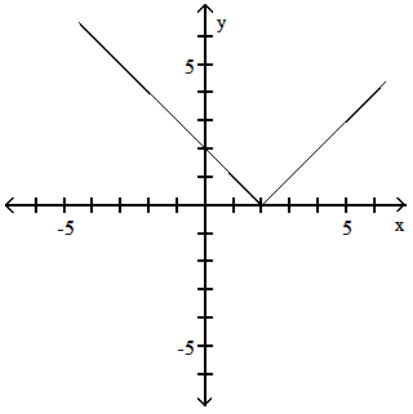
227)



A) $y = \sqrt{x + 1}$ B) $y = \sqrt{x - 1}$ C) $y = x - 1$ D) $y = \sqrt{x}$

Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

228)

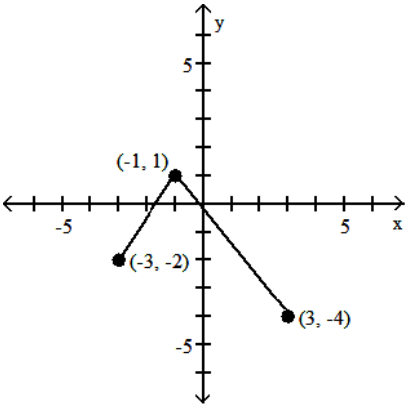


A) $y = |x + 2|$ B) $y = |1 - x|$ C) $y = x - 2$ D) $y = |2 - x|$

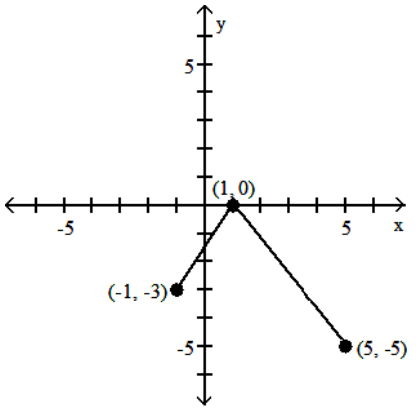
Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

Using transformations, sketch the graph of the requested function.

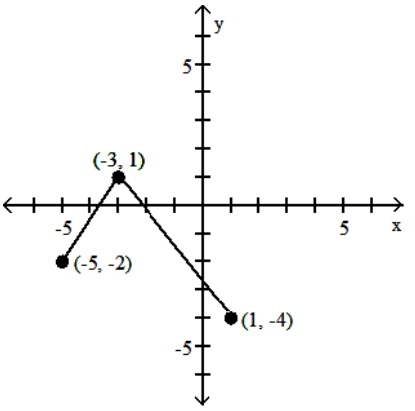
229) The graph of a function f is illustrated. Use the graph of f as the first step toward graphing the function F(x), where $F(x) = f(x + 2) - 1$.



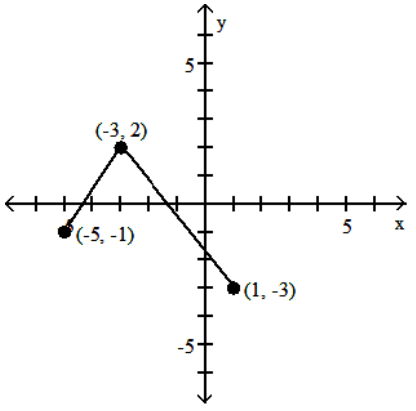
A)



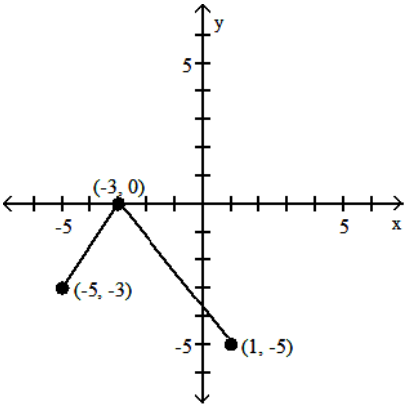
B)



C)



D)



Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

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

230) y = f(x + 2)

A) (4, 4) B) (2, 6) C) (2, 2) D) (0, 4)

Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

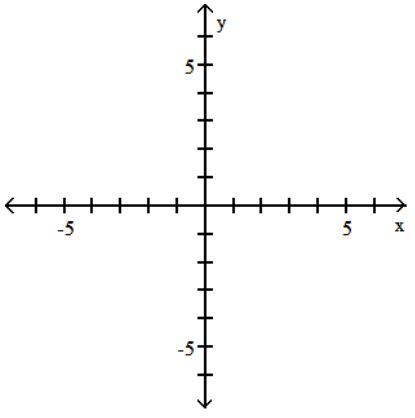
231) f(x) + 2

A) (4, 4) B) (0, 4) C) (2, −2) D) (2, 6)

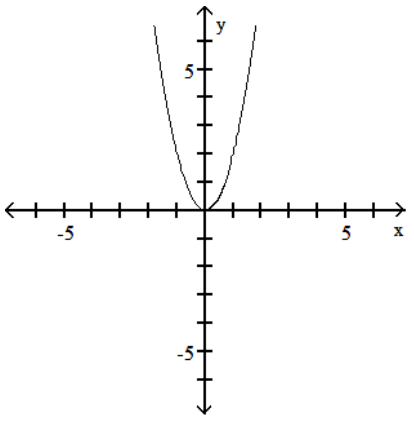
Objective: (1.5) Graph Functions Using Vertical and Horizontal Shifts

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

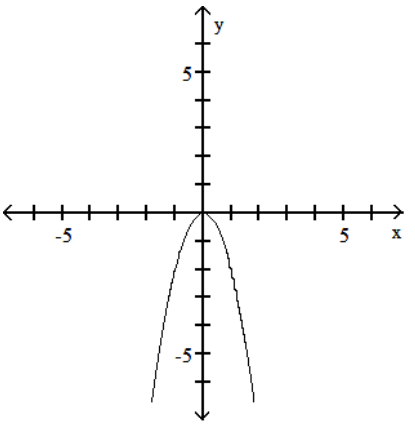
232) $f(x) = 2x^2$



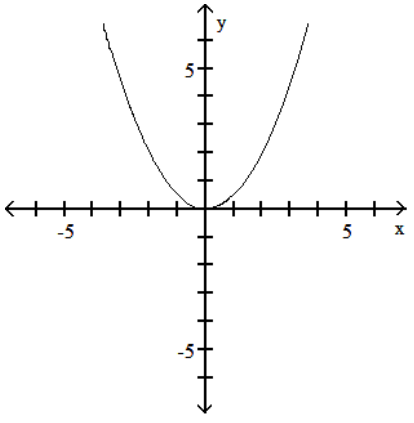
A)



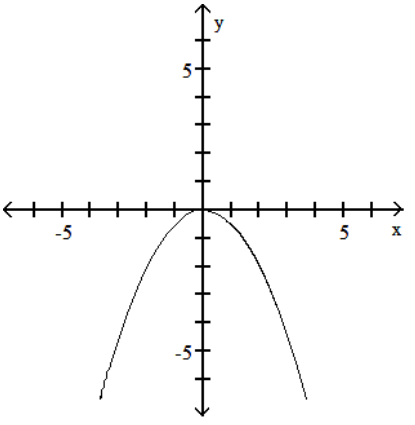
B)



C)

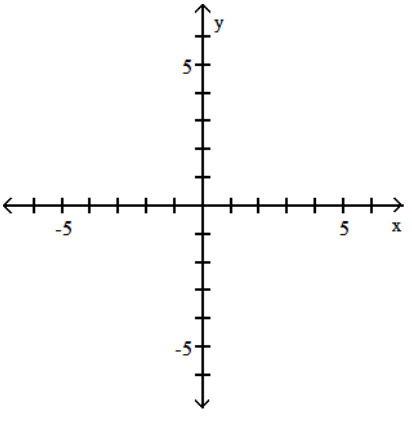


D)

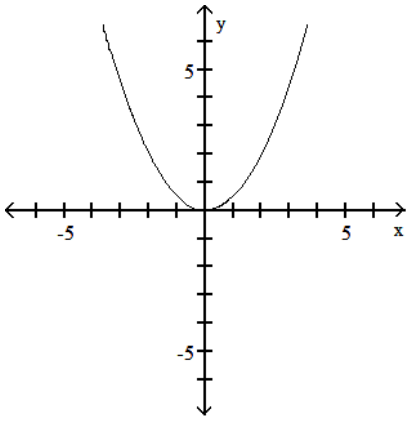


Objective: (1.5) Graph Functions Using Compressions and Stretches

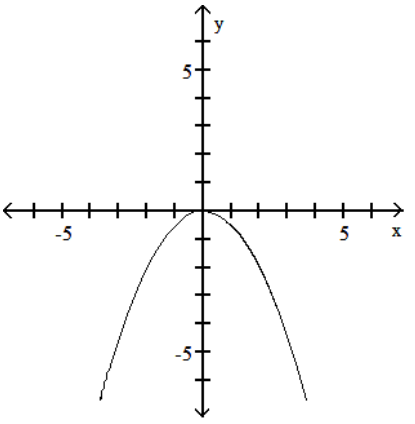
233) $f(x) = \frac{1}{2}x^2$



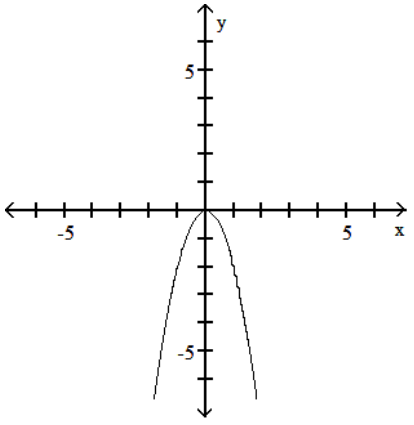
A)



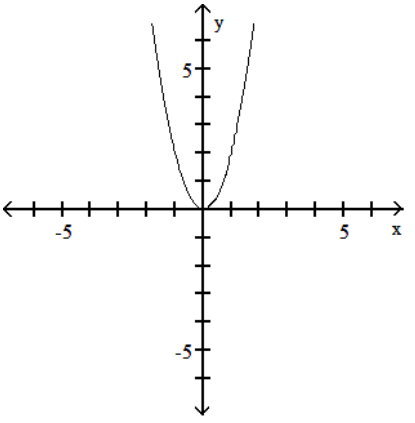
B)



C)

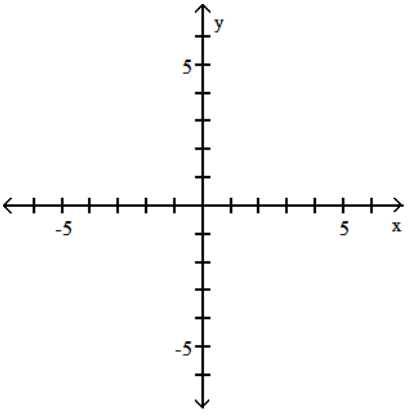


D)

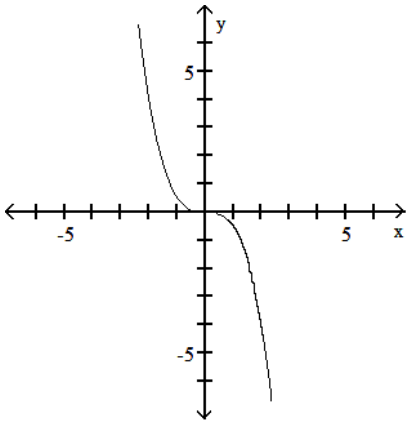


Objective: (1.5) Graph Functions Using Compressions and Stretches

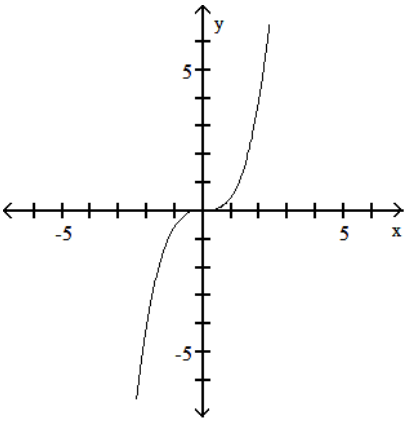
234) $f(x) = 2x^3$



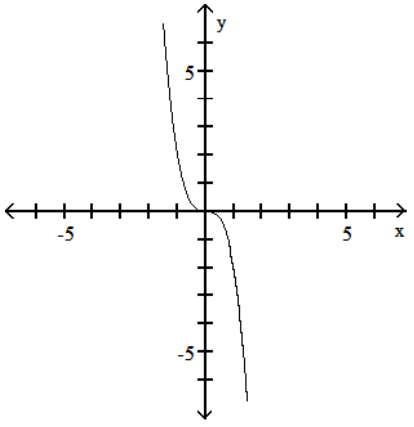
A)



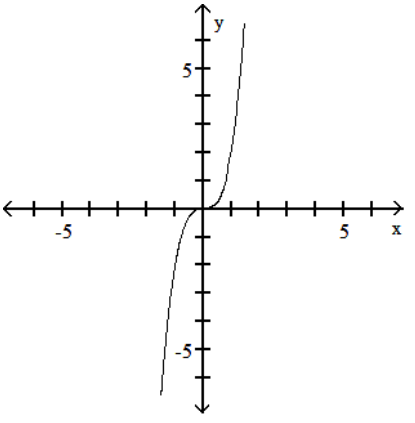
B)



C)

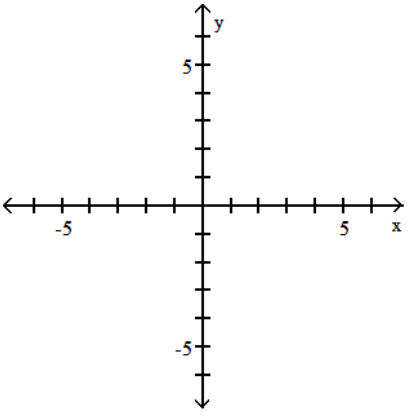


D)

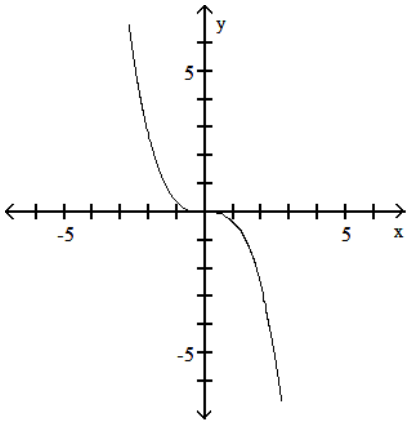


Objective: (1.5) Graph Functions Using Compressions and Stretches

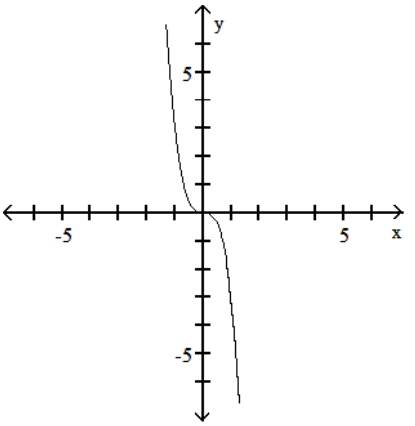
235) $f(x) = \frac{1}{3}x^3$



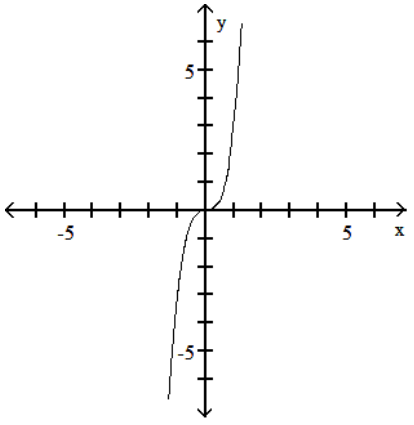
A)



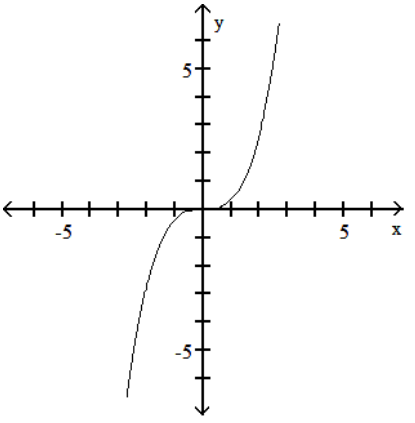
B)



C)

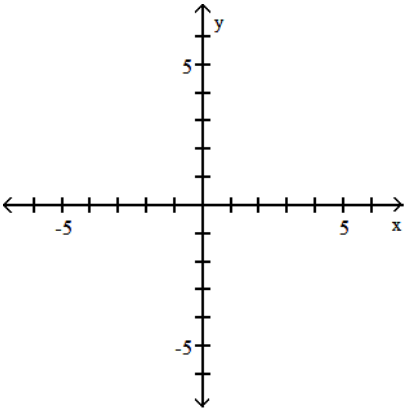


D)

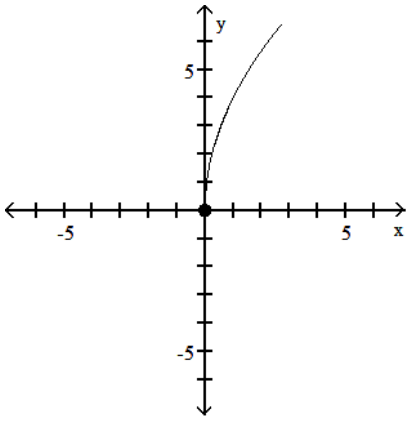


Objective: (1.5) Graph Functions Using Compressions and Stretches

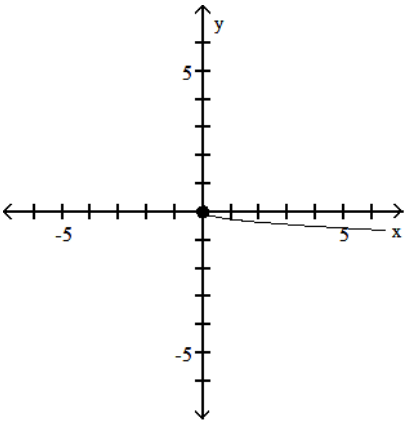
236) $f(x) = 4\sqrt{x}$



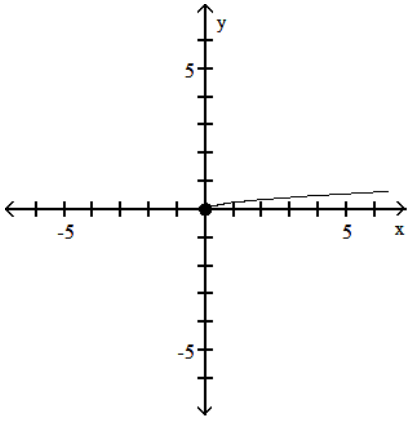
A)



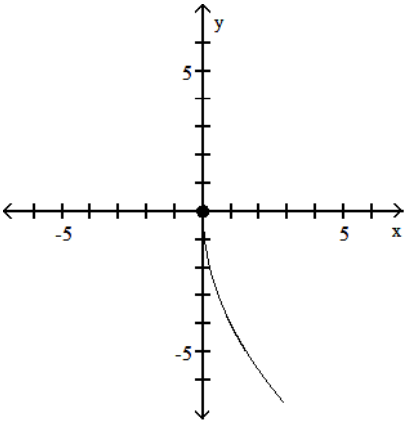
B)



C)

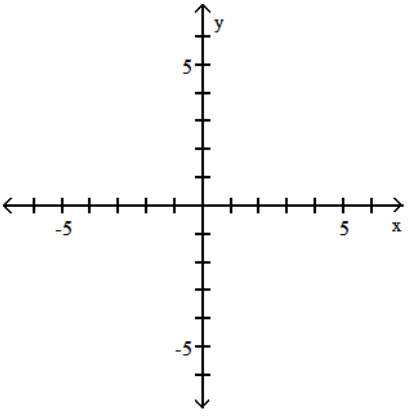


D)

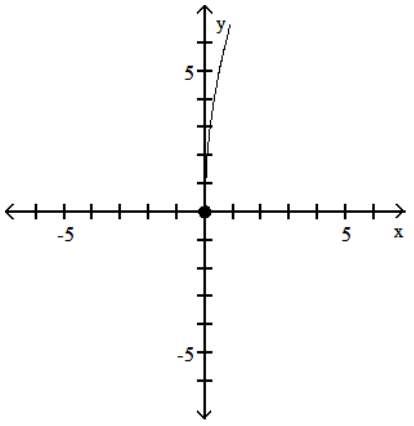


Objective: (1.5) Graph Functions Using Compressions and Stretches

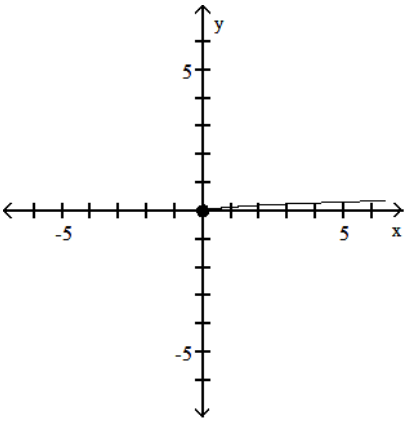
237) $f(x) = \frac{1}{7}\sqrt{x}$



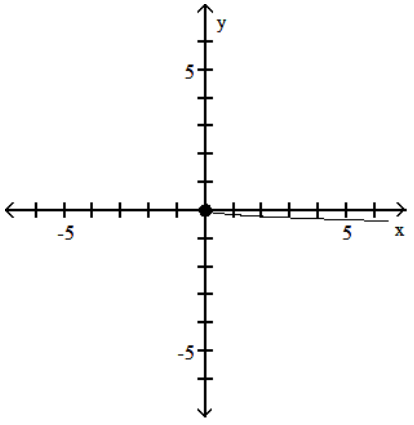
A)



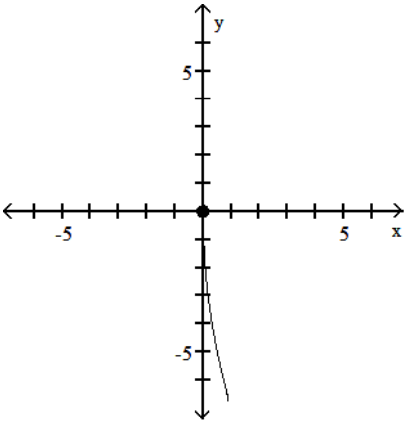
B)



C)

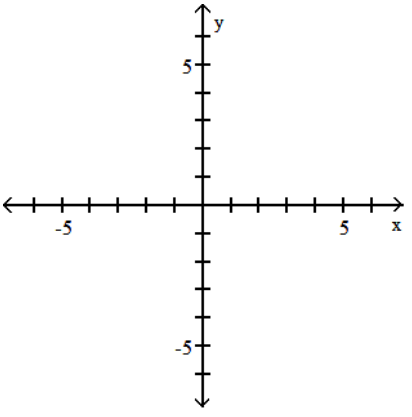


D)

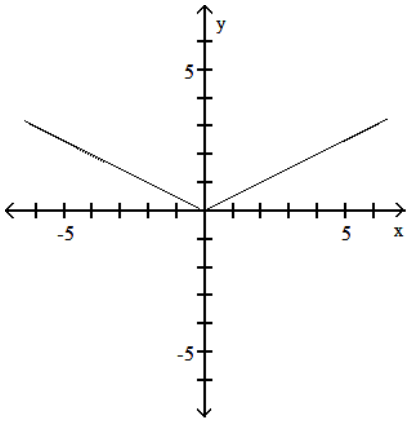


Objective: (1.5) Graph Functions Using Compressions and Stretches

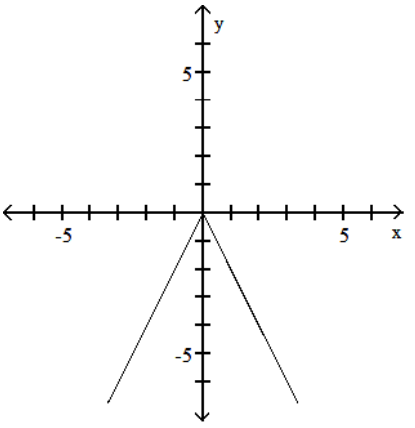
238) $f(x) = 2|x|$



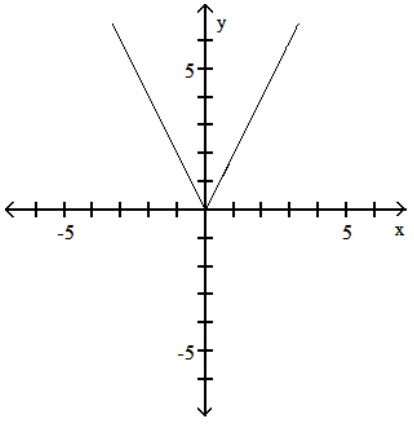
A)



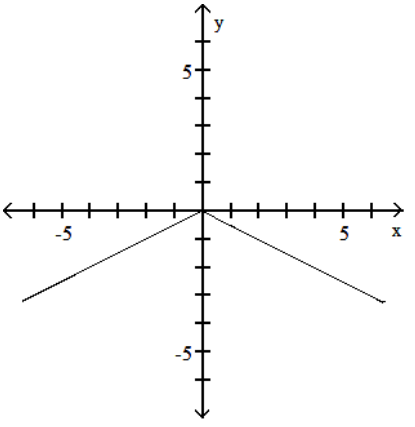
B)



C)

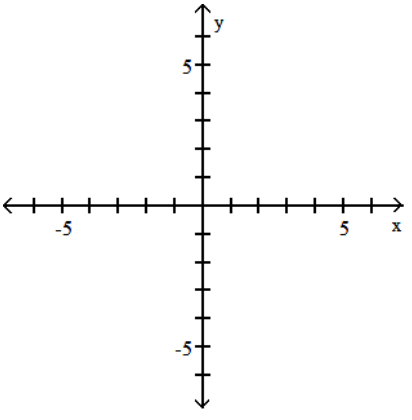


D)

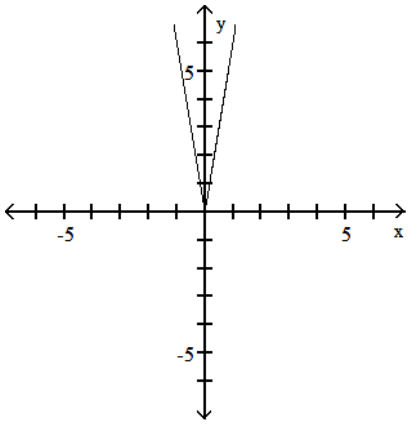


Objective: (1.5) Graph Functions Using Compressions and Stretches

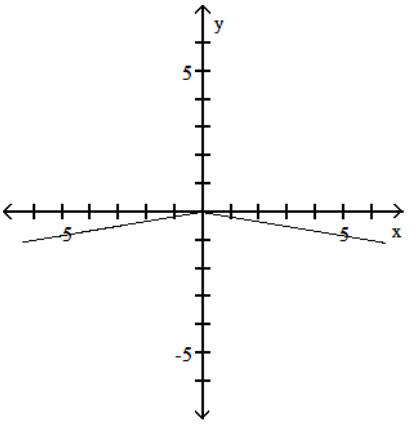
239) $f(x) = \frac{1}{6}|x|$



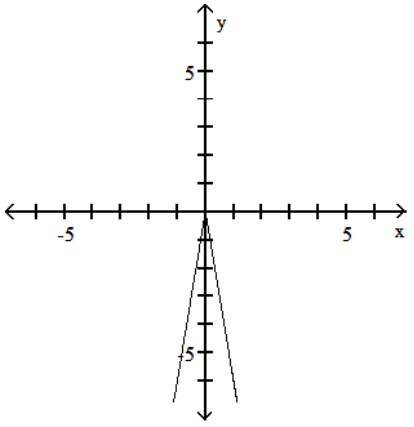
A)



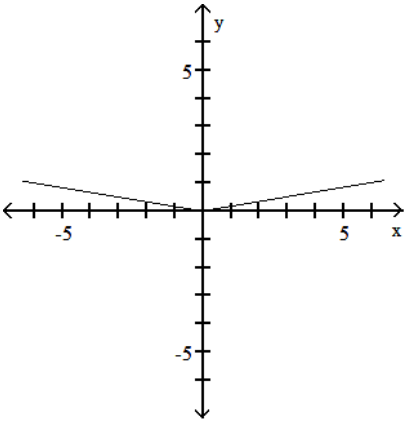
B)



C)

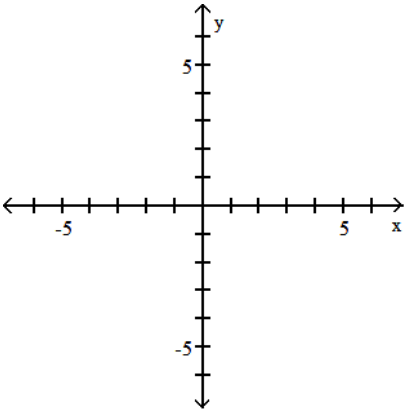


D)

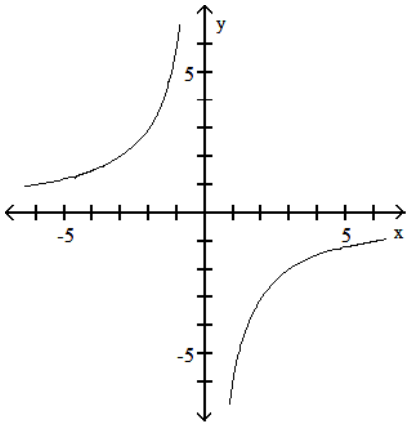


Objective: (1.5) Graph Functions Using Compressions and Stretches

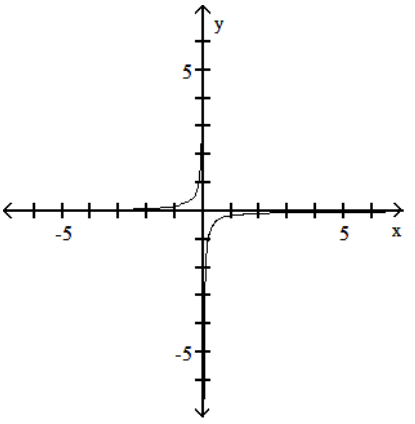
240) $f(x) = \frac{6}{x}$



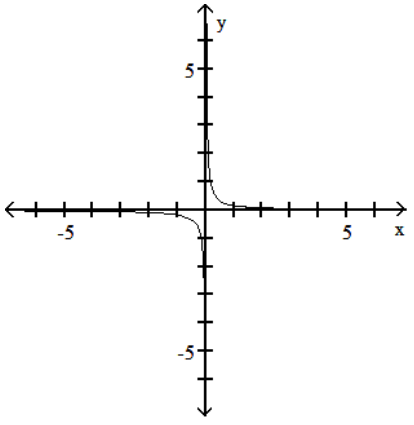
A)



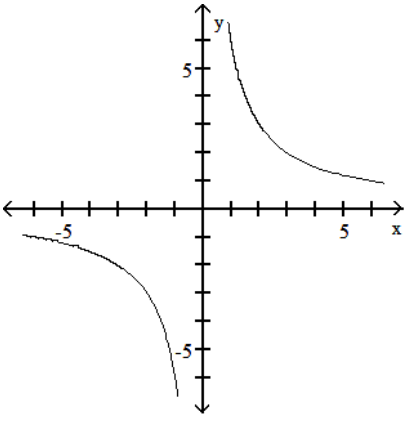
B)



C)

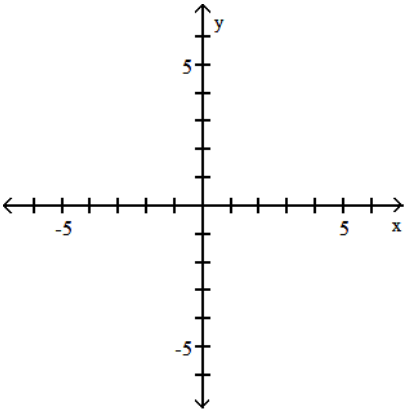


D)

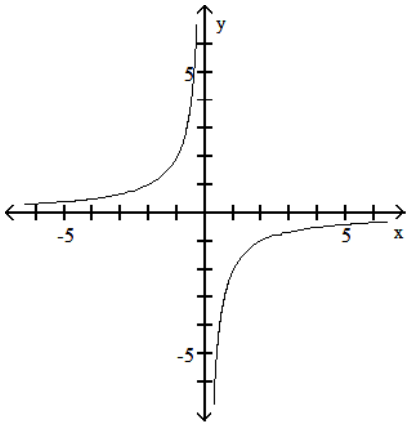


Objective: (1.5) Graph Functions Using Compressions and Stretches

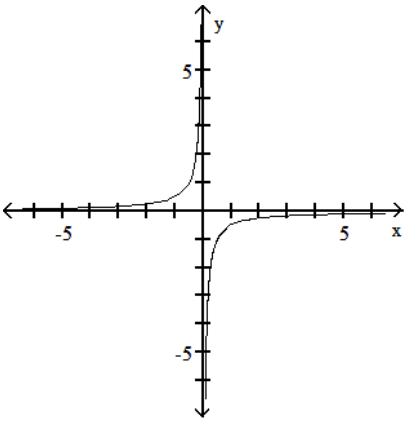
241) $f(x) = \frac{1}{2x}$



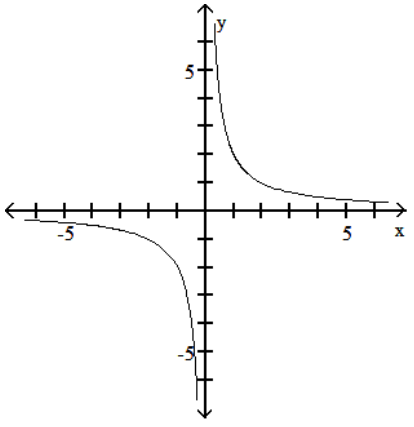
A)



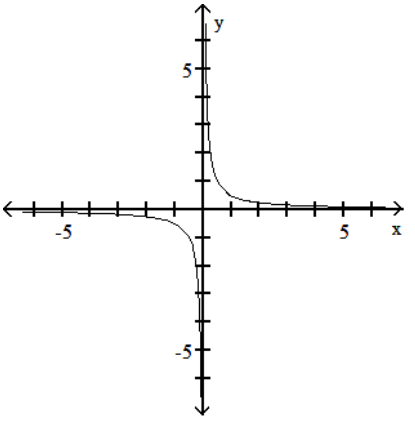
B)



C)

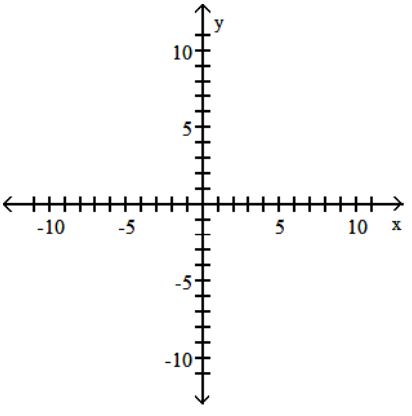


D)

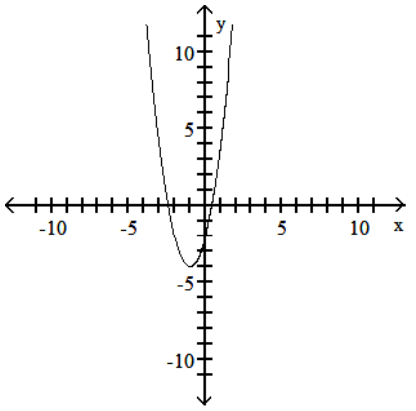


Objective: (1.5) Graph Functions Using Compressions and Stretches

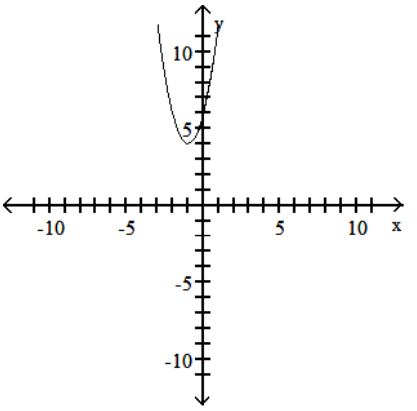
242) $f(x) = 2(x + 1)^2 + 4$



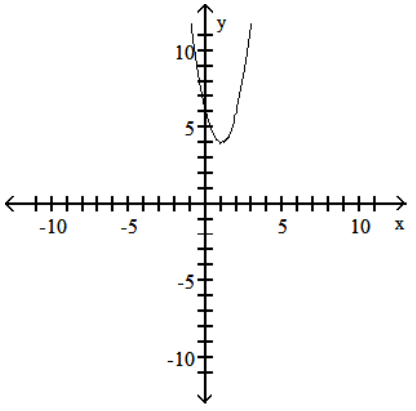
A)



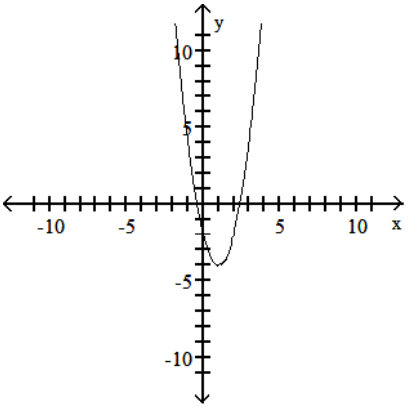
B)



C)



D)



Objective: (1.5) 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.

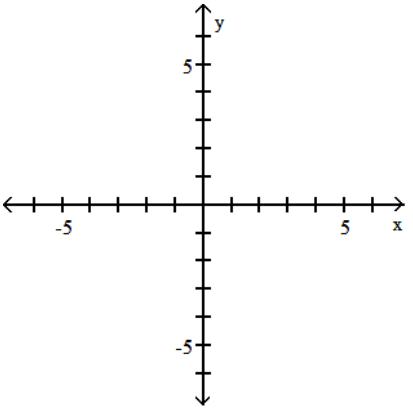
243) $y = 3f(x)$

A) (2, 6) B) (6, 4) C) (5, 2) D) (2, 12)

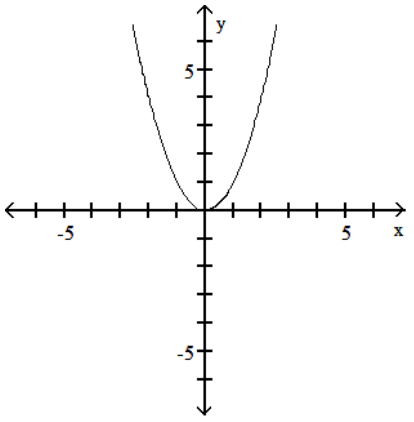
Objective: (1.5) Graph Functions Using Compressions and Stretches

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

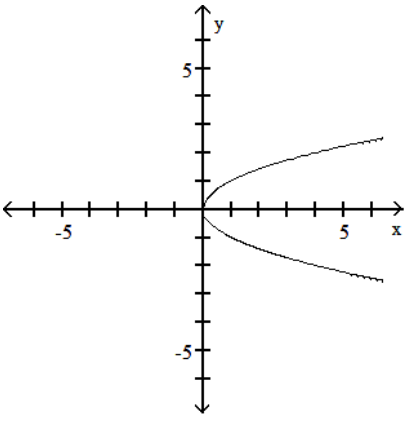
244) $f(x) = -x^2$



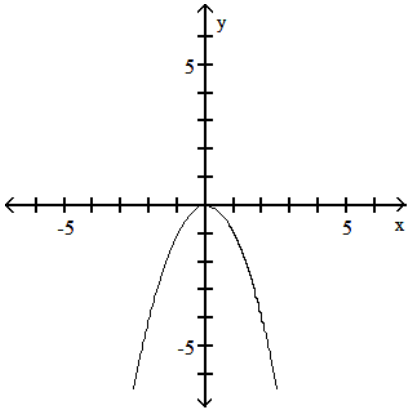
A)



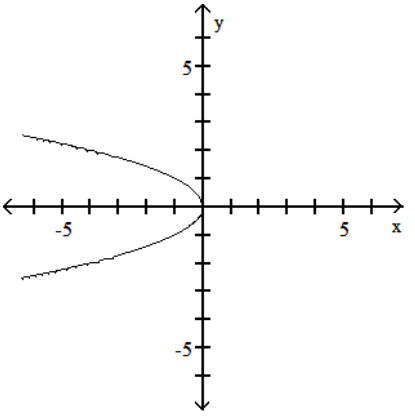
B)



C)

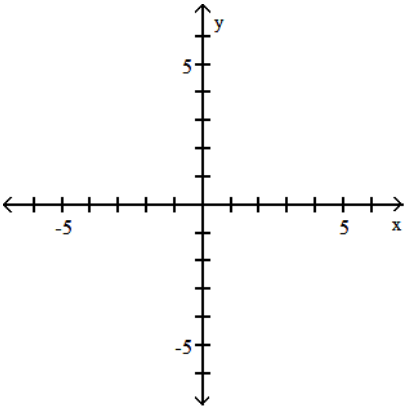


D)

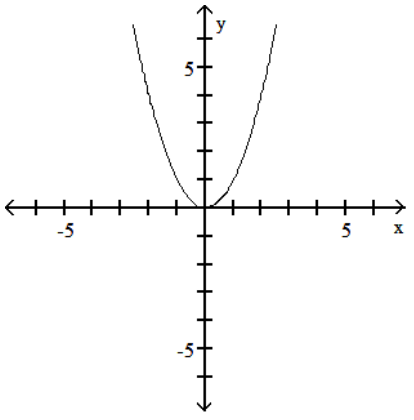


Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

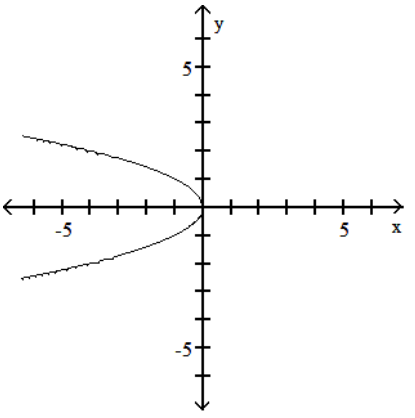
245) $f(x) = (-x)^2$



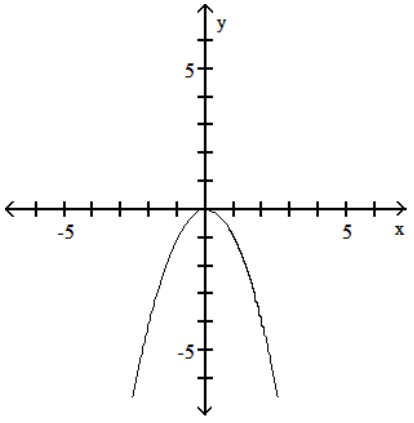
A)



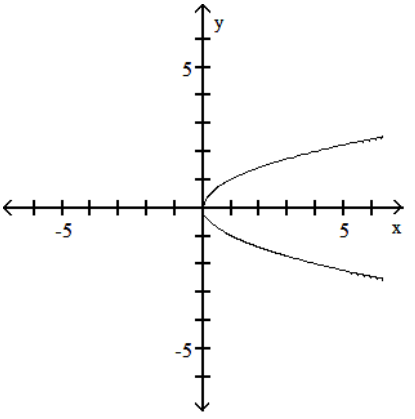
B)



C)

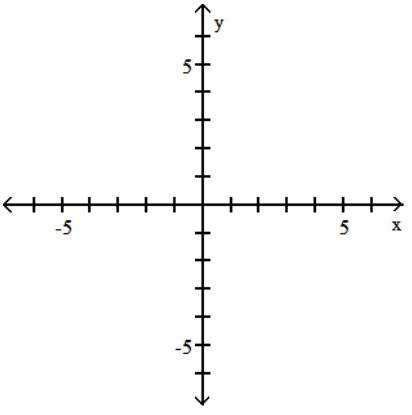


D)

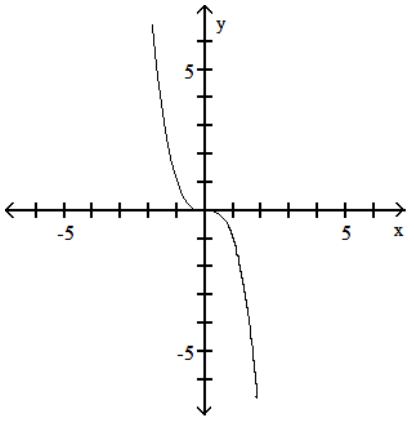


Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

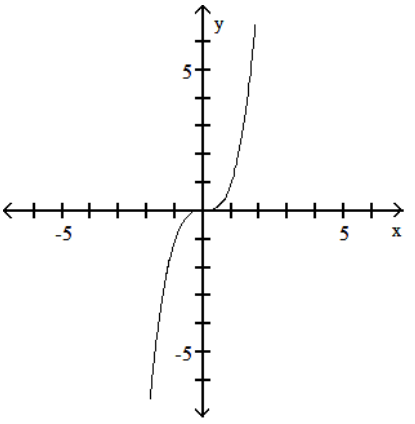
246) $f(x) = -x^3$



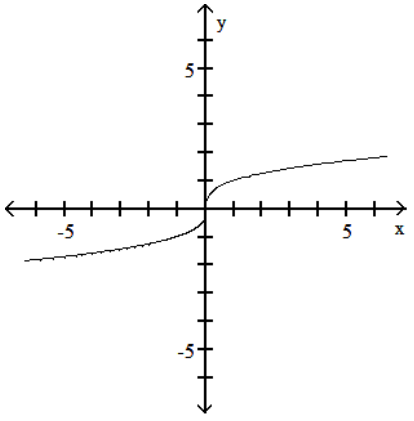
A)



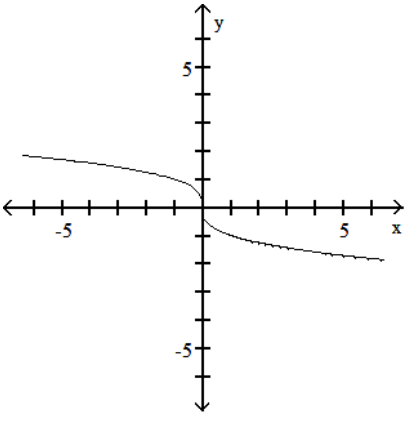
B)



C)

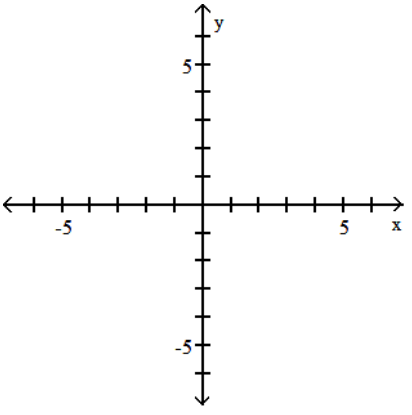


D)

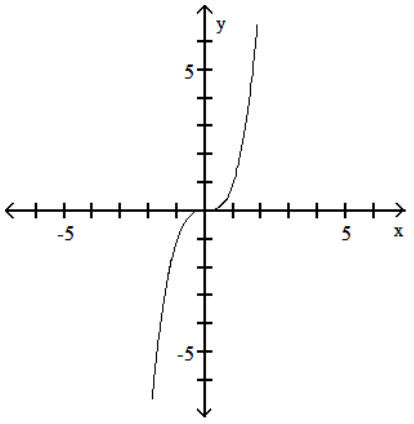


Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

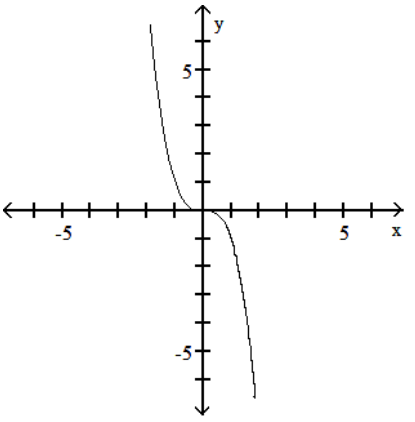
247) $f(x) = (-x)^3$



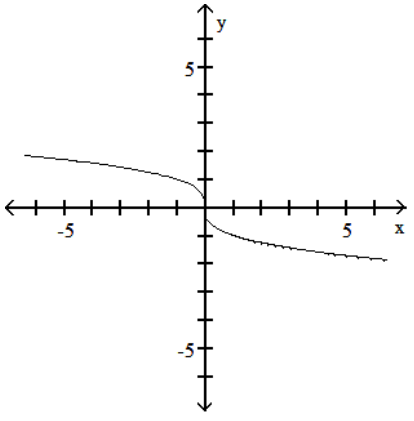
A)



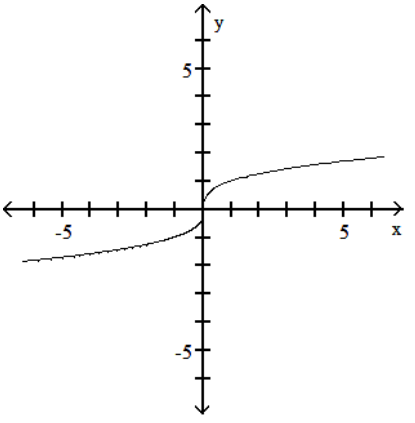
B)



C)

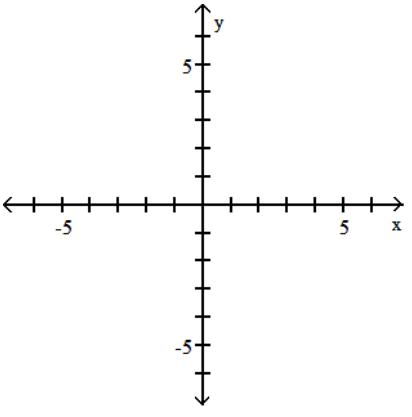


D)

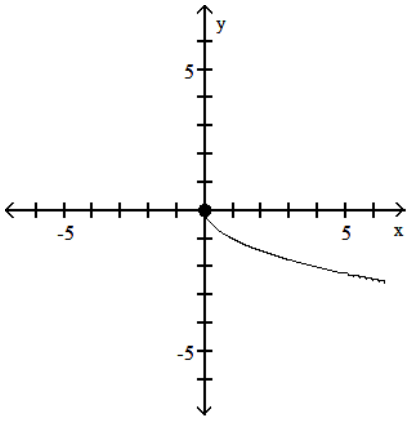


Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

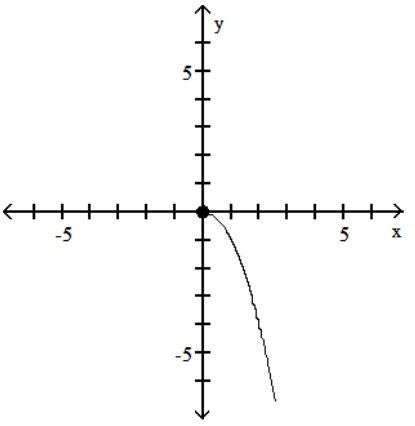
248) $f(x) = -\sqrt{x}$



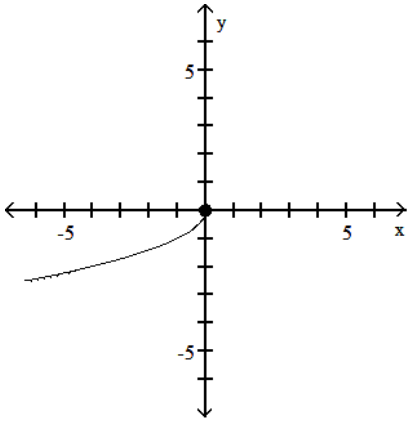
A)



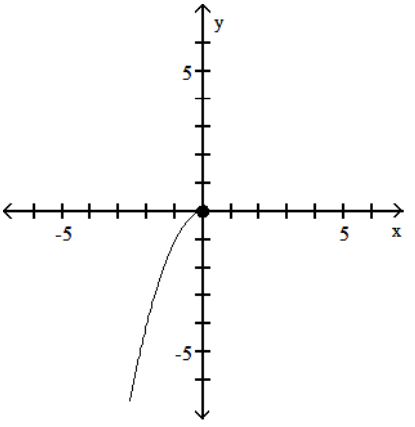
B)



C)

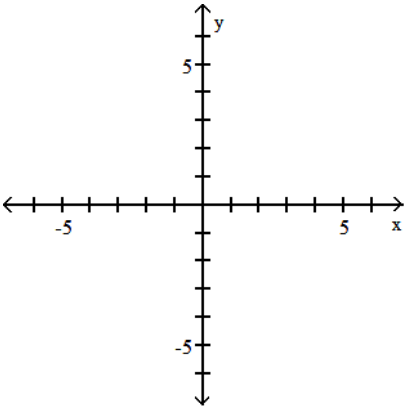


D)

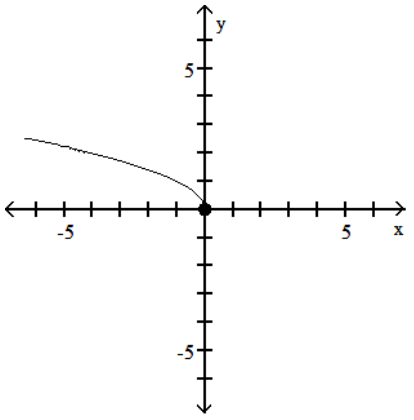


Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

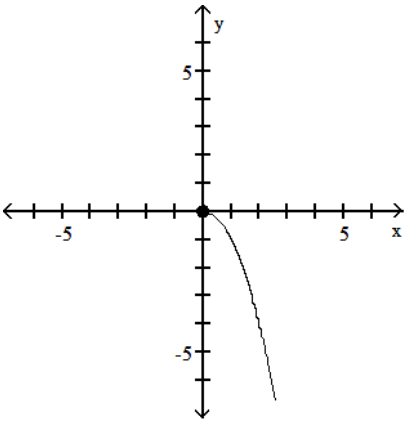
249) $f(x) = \sqrt{-x}$



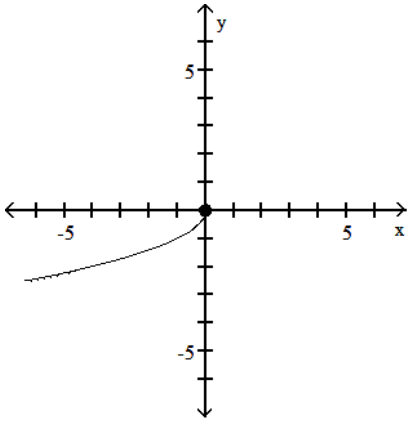
A)



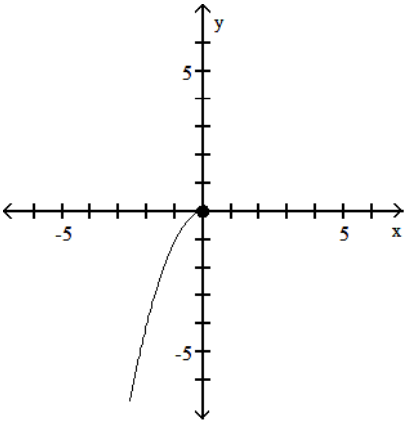
B)



C)

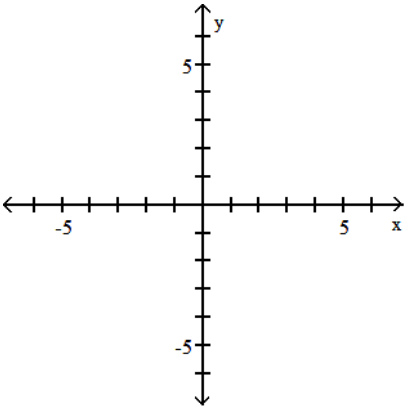


D)

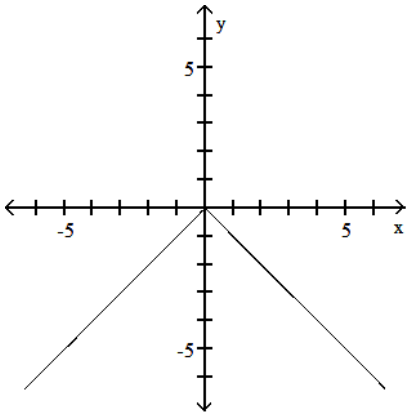


Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

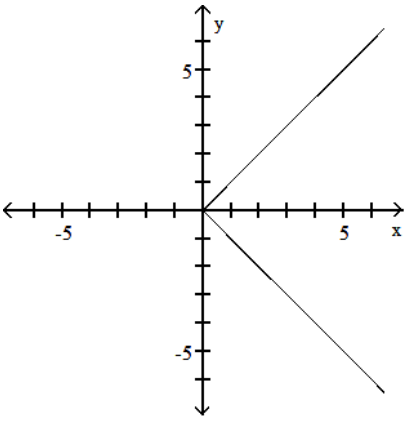
250) $f(x) = -|x|$



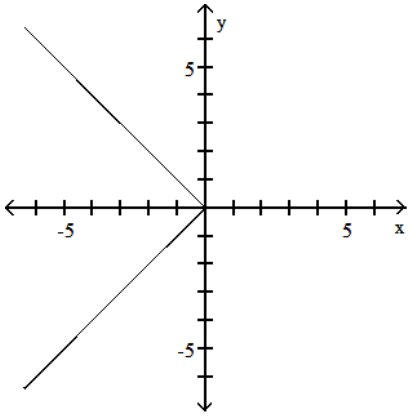
A)



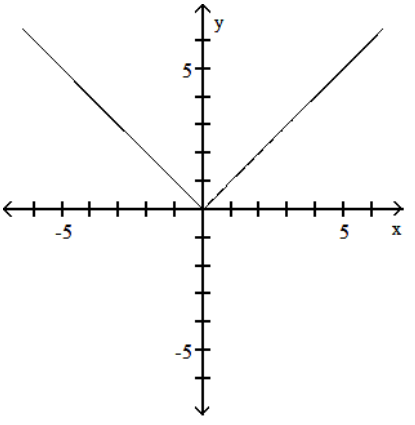
B)



C)

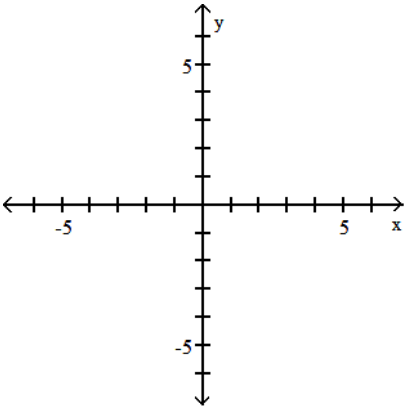


D)

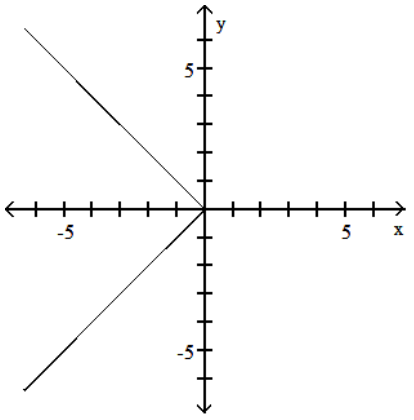


Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

251) $f(x) = |-x|$



A)



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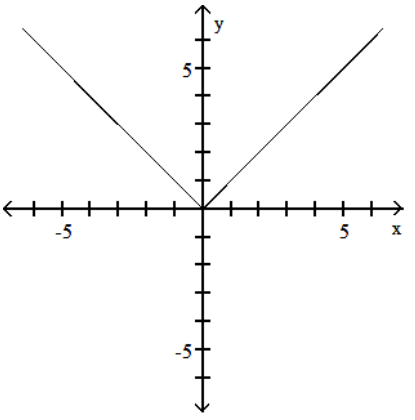

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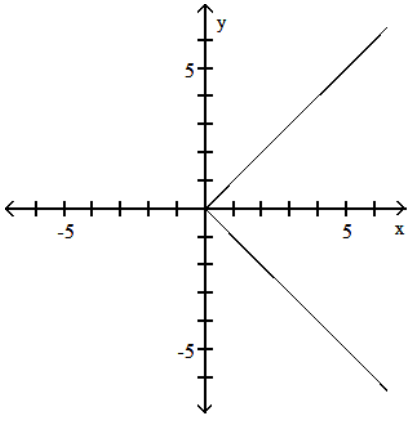

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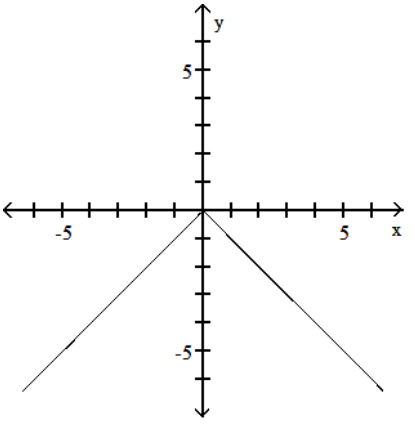
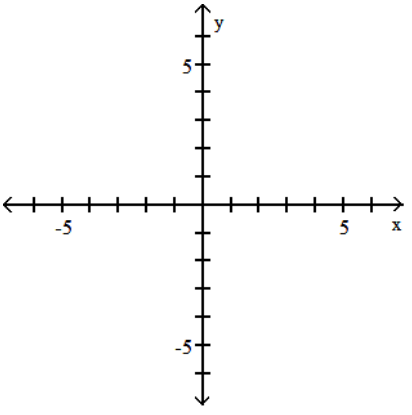
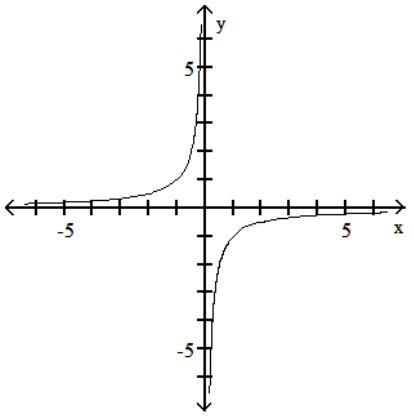


Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

252) $f(x) = -\frac{1}{x}$



A)



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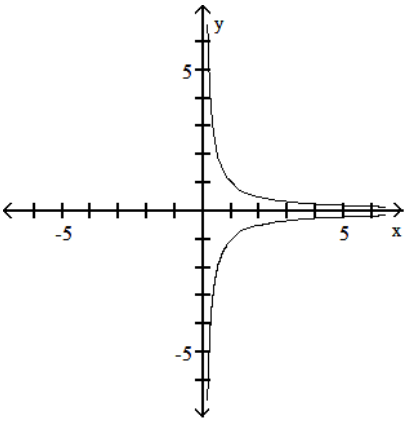

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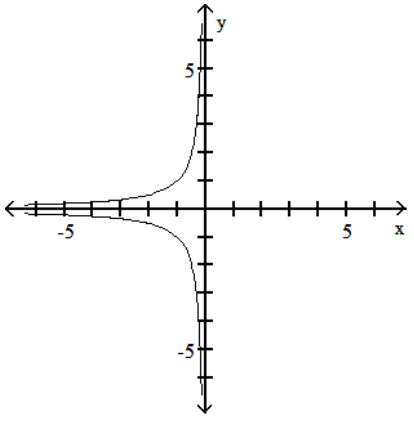

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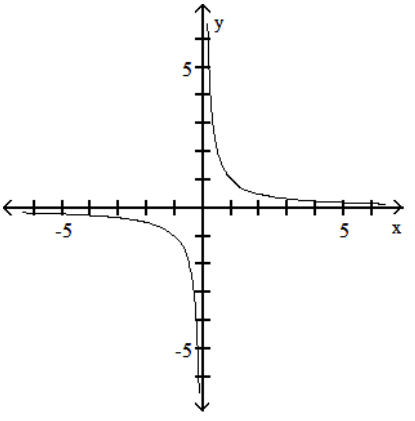
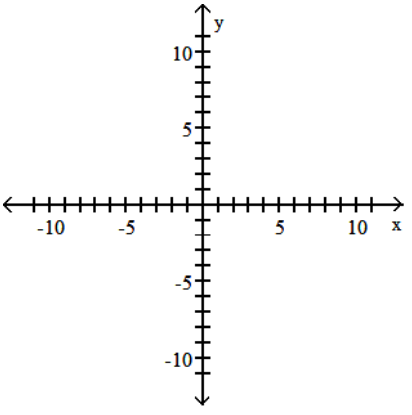
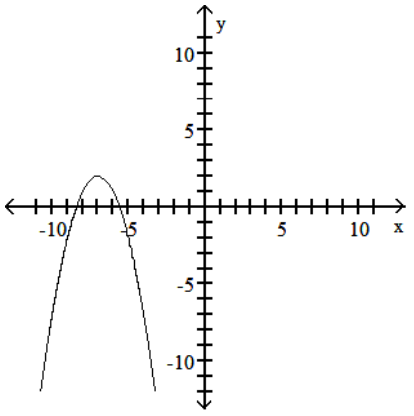


Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

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



A)



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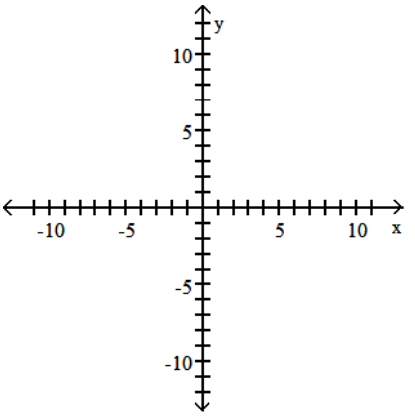

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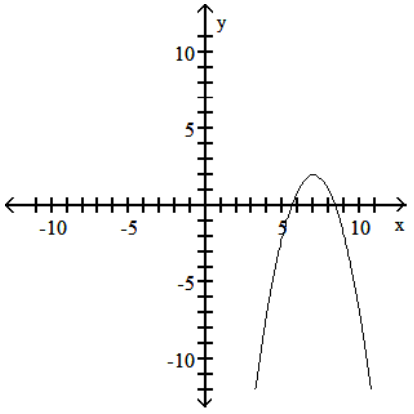

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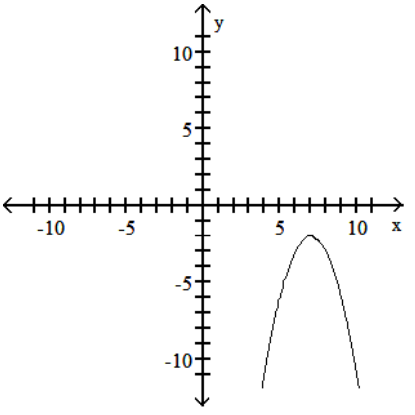
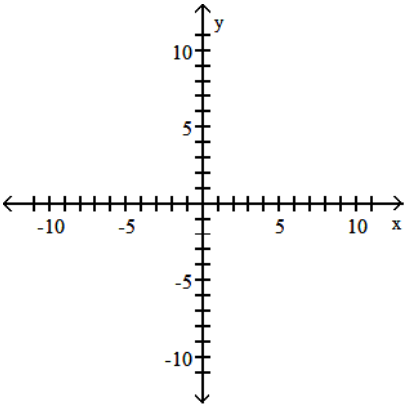
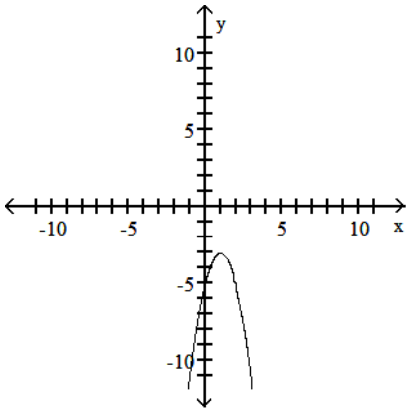


Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

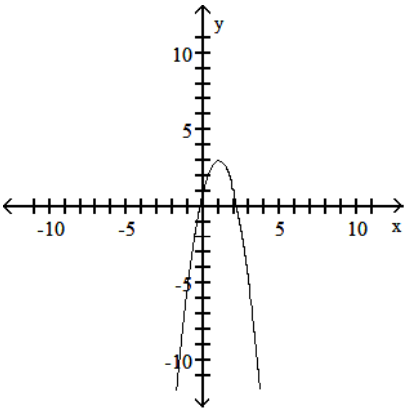
254) $f(x) = -2(x + 1)^2 + 3$



A)



B)



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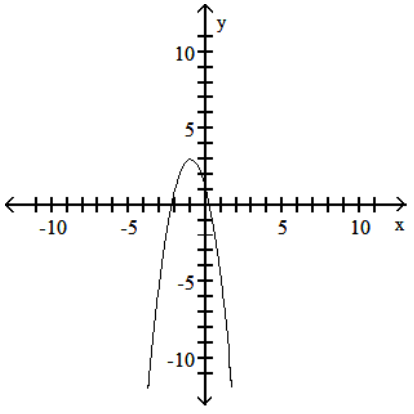
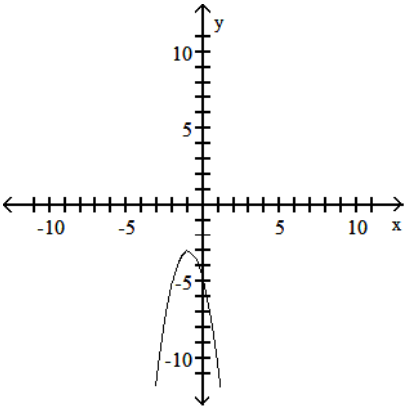


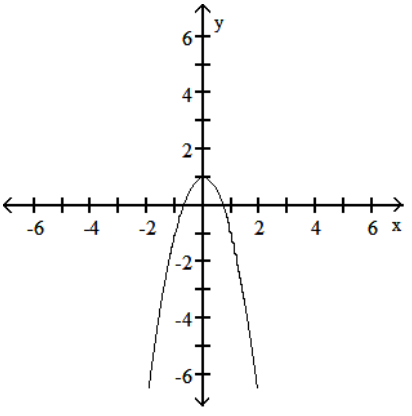
D)



Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

Match the correct function to the graph.

255)



A) $y = 1 - x^2$ B) $y = -2x^2$ C) $y = -2x^2 + 1$ D) $y = -2x^2 - 1$

Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

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

256) The reflection of the graph of y = f(x) across the x-axis

A) (−2, −4) B) (2, 4) C) (−2, 4) D) (2, −4)

Objective: (1.5) Graph Functions Using Reflections about the x-Axis and the y-Axis

257) The reflection of the graph of y = f(x) across the y–axis

A) (–2, 4) B) (2, –4) C) (2, 4) D) (–2, –4)

Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

Find the function.

258) 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.

A) $y = -3|x - 3| - 2$ B) $y = -(3|x + 3| - 2)$ C) $y = -(3|x - 3| - 2)$ D) $y = 3|-x - 3| - 2$

Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

259) Find the function that is finally graphed after the following transformations are applied to the graph of $y = \sqrt{x}$. The graph is shifted down 7 units, reflected about the x–axis, and finally shifted right 4 units.

A) $y = -\sqrt{x - 4} - 7$ B) $y = \sqrt{-x + 4} - 7$ C) $y = -\sqrt{x - 4} + 7$ D) $y = -\sqrt{x + 4} + 7$

Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

260) Find the function that is finally graphed after the following transformations are applied to the graph of y = |x|. The graph is shifted up 8 units, reflected about the y–axis, and finally shifted left 2 units.

A) $y = |-x + 2| - 8$ B) $y = |-x - 2| + 8$ C) $y = |-x - 2| - 8$ D) $y = -|x + 2| + 8$

Objective: (1.5) Graph Functions Using Reflections about the x–Axis and the y–Axis

Solve the problem.

261) Elissa wants to set up a rectangular dog run in her backyard. She has 20 feet of fencing to work with and wants to use it all. If the dog run is to be x feet long, express the area of the dog run as a function of x.

A) $A(x) = 9x - x^2$ B) $A(x) = 12x^2 - x$ C) $A(x) = 10x - x^2$ D) $A(x) = 11x - x^2$

Objective: (1.6) Build and Analyze Functions

262) Bob wants to fence in a rectangular garden in his yard. He has 66 feet of fencing to work with and wants to use it all. If the garden is to be x feet wide, express the area of the garden as a function of x.

A) $A(x) = 33x - x^2$ B) $A(x) = 34x - x^2$ C) $A(x) = 32x - x^2$ D) $A(x) = 35x^2 - x$

Objective: (1.6) Build and Analyze Functions

263) Sue wants to put a rectangular garden on her property using 84 meters of fencing. There is a river that runs through her property so she decides to increase the size of the garden by using the river as one side of the rectangle. (Fencing is then needed only on the other three sides.) Let x represent the length of the side of the rectangle along the river. Express the garden's area as a function of x.

A) $A(x) = 41x - \frac{1}{4}x^2$ B) $A(x) = 42x^2 - x$ C) $A(x) = 43x - 2x^2$ D) $A(x) = 42x - \frac{1}{2}x^2$

Objective: (1.6) Build and Analyze Functions

264) A farmer has 1400 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?

A) $A(x) = -x^2 + 700x;\ \{x|0 < x < 700\}$ B) $A(x) = x^2 + 700x;\ \{x|0 < x < 700\}$

C) $A(x) = -x^2 + 1400x;\ \{x|0 < x < 1400\}$ D) $A(x) = -x^2 + 700x;\ \{x|0 < x < 1400\}$

Objective: (1.6) Build and Analyze Functions

265) A rectangular sign is being designed so that the length of its base, in feet, is 2 feet less than 4 times the height, h. Express the area of the sign as a function of h.

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

Objective: (1.6) Build and Analyze Functions

266) A rectangle that is x feet wide is inscribed in a circle of radius 31 feet. Express the area of the rectangle as a function of x.

A) $A(x) = x\sqrt{3844 - x^2}$ B) $A(x) = x(3844 - x^2)$

C) $A(x) = x^2\sqrt{1922 - x^2}$ D) $A(x) = x\sqrt{2883 - x}$

Objective: (1.6) Build and Analyze Functions

267) A wire of length 6x is bent into the shape of a square. Express the area A of the square as a function of x.

A) $A(x) = \frac{3}{2}x^2$ B) $A(x) = \frac{1}{16}x^2$ C) $A(x) = \frac{9}{4}x^2$ D) $A(x) = \frac{9}{2}x^2$

Objective: (1.6) Build and Analyze Functions

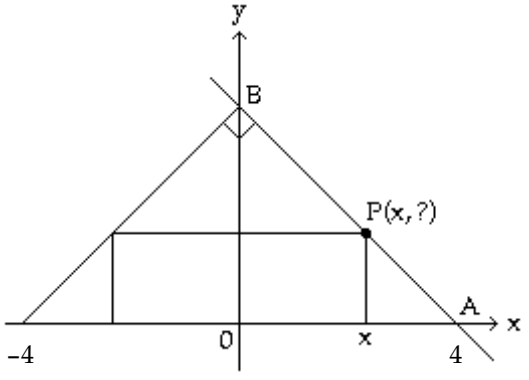
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

268) A right triangle has one vertex on the graph of $y = x^2$ at (x, y), another at the origin, and the third on the (positive) y–axis at (0, y). Express the area A of the triangle as a function of x.

Objective: (1.6) Build and Analyze Functions

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

269) The figure shown here shows a rectangle inscribed in an isosceles right triangle whose hypotenuse is 8 units long. Express the area A of the rectangle in terms of x.



A) $A(x) = 2x(x - 4)$ B) $A(x) = 2x^2$ C) $A(x) = 2x(4 - x)$ D) $A(x) = x(4 - x)$

Objective: (1.6) Build and Analyze Functions

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

270) A wire 20 feet long is to be cut into two pieces. One piece will be shaped as a square and the other piece will be shaped as an equilateral triangle. Express the total area A enclosed by the pieces of wire as a function of the length x of a side of the equilateral triangle. What is the domain of A?

Objective: (1.6) Build and Analyze Functions

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

271) A farmer's silo is the shape of a cylinder with a hemisphere as the roof. If the height of the silo is 74 feet and the radius of the hemisphere is r feet, express the volume of the silo as a function of r.

A) $V(r) = 74\pi r^2 + \frac{8}{3}\pi r^3$

B) $V(r) = \pi(74 - r)r^2 + \frac{2}{3}\pi r^3$

C) $V(r) = \pi(74 - r) + \frac{4}{3}\pi r^2$

D) $V(r) = \pi(74 - r)r^3 + \frac{4}{3}\pi r^2$

Objective: (1.6) Build and Analyze Functions

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

272) 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.

Objective: (1.6) Build and Analyze Functions

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

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

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

B) $V(h) = 100\,\pi(h^2 - 10) + \frac{5000}{3}\pi$

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

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

Objective: (1.6) Build and Analyze Functions

274) From a 34-inch by 34-inch piece of metal, squares are cut out of the four corners so that the sides can then be folded up to make a box. Let x represent the length of the sides of the squares, in inches, that are cut out. Express the volume of the box as a function of x.

A) $V(x) = 4x^3 - 136x^2 + 1156x$

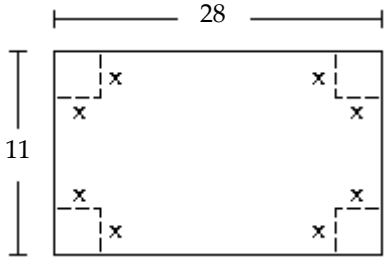
B) $V(x) = 2x^3 - 102x^2 + 34x$

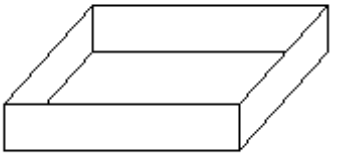
C) $V(x) = 2x^3 - 102x^2$

D) $V(x) = 4x^3 - 136x^2$

Objective: (1.6) Build and Analyze Functions

275) A box with an open top is to be constructed from a rectangular piece of cardboard with dimensions 11 inches by 28 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.





A) $V(x) = (11 - x)(28 - x)$

B) $V(x) = (11 - 2x)(28 - 2x)$

C) $V(x) = x(11 - 2x)(28 - 2x)$

D) $V(x) = x(11 - x)(28 - x)$

Objective: (1.6) Build and Analyze Functions

276) A rectangular box with volume 465 cubic feet is built with a square base and top. The cost is $1.50 per square foot for the top and the bottom and $2.00 per square foot for the sides. Let x represent the length of a side of the base. Express the cost the box as a function of x.

A) $C(x) = 2x^2 + \frac{3720}{x}$ B) $C(x) = 3x^2 + \frac{3720}{x}$ C) $C(x) = 4x + \frac{3720}{x^2}$ D) $C(x) = 3x^2 + \frac{1860}{x}$

Objective: (1.6) Build and Analyze Functions

277) The price p and the quantity x sold of a certain product obey the demand equation:

$p = -\frac{1}{7}x + 200, \{x \mid 0 \le x \le 700\}$

What is the revenue to the nearest dollar when 300 units are sold?

A) $40,000 B) $47,143 C) $130,000 D) $72,857

Objective: (1.6) Build and Analyze Functions

278) Let P = (x, y) be a point on the graph of $y = \sqrt{x}$. Express the distance d from P to the point (1, 0) as a function of x.

A) $d(x) = x^2 + 2x + 2$ B) $d(x) = \sqrt{x^2 - x + 1}$ C) $d(x) = \sqrt{x^2 + 2x + 2}$ D) $d(x) = x^2 - x + 1$

Objective: (1.6) Build and Analyze Functions

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

279) The price p and x, the quantity of a certain product sold, obey the demand equation

$p = -\frac{1}{10}x + 100, \{x \mid 0 \le x \le 1000\}$

a) Express the revenue R as a function of x.
b) What is the revenue if 450 units are sold?
c) Graph the revenue function using a graphing utility.
d) What quantity x maximizes revenue? What is the maximum revenue?
e) What price should the company charge to maximize revenue?

Objective: (1.6) Build and Analyze Functions

280) Two boats leave a dock at the same time. One boat is headed directly east at a constant speed of 35 knots (nautical miles per hour), and the other is headed directly south at a constant speed of 22 knots. Express the distance d between the boats as a function of the time t.

Objective: (1.6) Build and Analyze Functions

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

281) A rocket is shot straight up in the air from the ground at a rate of 43 feet per second. The rocket is tracked by a range finder that is 493 feet from the launch pad. Let d represent the distance from the rocket to the range finder and t represent the time, in seconds, since "blastoff". Express d as a function of t.

A) $d(t) = \sqrt{43^2 + (493t)^2}$ B) $d(t) = \sqrt{493^2 + (43t)^2}$

C) $d(t) = 493 + 43t^2$ D) $d(t) = 493^2 + (43t)^2$

Objective: (1.6) Build and Analyze Functions

If y varies directly as x, find a linear function which relates them.

282) y = 3 when x = 24

A) $f(x) = \frac{x}{3}$ B) $f(x) = 8x$ C) $f(x) = x + 21$ D) $f(x) = \frac{x}{8}$

Objective: (1.7) Construct a Model Using Direct Variation

283) y = 15 when x = 27

A) $f(x) = 3x$ B) $f(x) = x - 12$ C) $f(x) = \frac{5}{9}x$ D) $f(x) = \frac{9}{5}x$

Objective: (1.7) Construct a Model Using Direct Variation

284) y = 5 when $x = \frac{1}{3}$

A) $f(x) = 15x$ B) $f(x) = x + \frac{14}{3}$ C) $f(x) = \frac{x}{15}$ D) $f(x) = \frac{x}{5}$

Objective: (1.7) Construct a Model Using Direct Variation

285) y = 0.8 when x = 0.2

A) $f(x) = 0.2x$ B) $f(x) = x + 0.6$ C) $f(x) = 4x$ D) $f(x) = 0.25x$

Objective: (1.7) Construct a Model Using Direct Variation

286) y = 0.4 when x = 2

A) $f(x) = 0.2x$ B) $f(x) = x - 1.6$ C) $f(x) = 0.4x$ D) $f(x) = 5x$

Objective: (1.7) Construct a Model Using Direct Variation

Solve.

287) The amount of water used to take a shower is directly proportional to the amount of time that the shower is in use. A shower lasting 24 minutes requires 14.4 gallons of water. Find the amount of water used in a shower lasting 8 minutes.

A) 5.4 gallons B) 4.2 gallons C) 192 gallons D) 4.8 gallons

Objective: (1.7) Construct a Model Using Direct Variation

288) If the resistance in an electrical circuit is held constant, the amount of current flowing through the circuit varies directly with the amount of voltage applied to the circuit. When 9 volts are applied to a circuit, 180 milliamperes of current flow through the circuit. Find the new current if the voltage is increased to 10 volts.

A) 190 milliamperes B) 220 milliamperes C) 90 milliamperes D) 200 milliamperes

Objective: (1.7) Construct a Model Using Direct Variation

289) The amount of gas that a helicopter uses is directly proportional to the number of hours spent flying. The helicopter flies for 4 hours and uses 32 gallons of fuel. Find the number of gallons of fuel that the helicopter uses to fly for 5 hours.

A) 20 gallons B) 45 gallons C) 48 gallons D) 40 gallons

Objective: (1.7) Construct a Model Using Direct Variation

Solve the problem.

290) When the temperature stays the same, the volume of a gas is inversely proportional to the pressure of the gas. If a balloon is filled with 348 cubic inches of a gas at a pressure of 14 pounds per square inch, find the new pressure of the gas if the volume is decreased to 58 cubic inches.

A) 70 pounds per square inch
B) $\frac{29}{7}$ pounds per square inch
C) 84 pounds per square inch
D) 78 pounds per square inch

Objective: (1.7) Construct a Model Using Inverse Variation

291) If the force acting on an object stays the same, then the acceleration of the object is inversely proportional to its mass. If an object with a mass of 6 kilograms accelerates at a rate of 2 meters per second per second by a force, find the rate of acceleration of an object with a mass of 2 kilograms that is pulled by the same force.

A) 6 meters per second per second
B) $\frac{2}{3}$ meters per second per second
C) 3 meters per second per second
D) 4 meters per second per second

Objective: (1.7) Construct a Model Using Inverse Variation

292) While traveling at a constant speed in a car, the centrifugal acceleration passengers feel while the car is turning is inversely proportional to the radius of the turn. If the passengers feel an acceleration of 6 feet per second per second when the radius of the turn is 80 feet, find the acceleration the passengers feel when the radius of the turn is 240 feet.

A) 4 feet per second per second
B) 2 feet per second per second
C) 3 feet per second per second
D) 5 feet per second per second

Objective: (1.7) Construct a Model Using Inverse Variation

293) The amount of time it takes a swimmer to swim a race is inversely proportional to the average speed of the swimmer. A swimmer finishes a race in 500 seconds with an average speed of 3 feet per second. Find the average speed of the swimmer if it takes 375 seconds to finish the race.

A) 5 feet per second
B) 3 feet per second
C) 6 feet per second
D) 4 feet per second

Objective: (1.7) Construct a Model Using Inverse Variation

294) If the voltage, V, in an electric circuit is held constant, the current, I, is inversely proportional to the resistance, R. If the current is 100 milliamperes when the resistance is 4 ohms, find the current when the resistance is 20 ohms.

A) 20 milliamperes
B) 495 milliamperes
C) 80 milliamperes
D) 500 milliamperes

Objective: (1.7) Construct a Model Using Inverse Variation

295) The gravitational attraction A between two masses varies inversely as the square of the distance between them. The force of attraction is 4 lb when the masses are 3 ft apart, what is the attraction when the masses are 6 ft apart?

A) 2 lb
B) 1 lb
C) 3 lb
D) 4 lb

Objective: (1.7) Construct a Model Using Inverse Variation

Solve.

296) The amount of paint needed to cover the walls of a room varies jointly as the perimeter of the room and the height of the wall. If a room with a perimeter of 65 feet and 6–foot walls requires 3.9 quarts of paint, find the amount of paint needed to cover the walls of a room with a perimeter of 45 feet and 6–foot walls.

A) 27 quarts
B) 2.7 quarts
C) 270 quarts
D) 5.4 quarts

Objective: (1.7) Construct a Model Using Joint or Combined Variation

297) The amount of simple interest earned on an investment over a fixed amount of time is jointly proportional to the principle invested and the interest rate. A principle investment of $1400.00 with an interest rate of 1% earned $14.00 in simple interest. Find the amount of simple interest earned if the principle is $4900.00 and the interest rate is 2%.

A) $28.00 B) $9800.00 C) $49.00 D) $98.00

Objective: (1.7) Construct a Model Using Joint or Combined Variation

298) The voltage across a resistor is jointly proportional to the resistance of the resistor and the current flowing through the resistor. If the voltage across a resistor is 14 volts for a resistor whose resistance is 2 ohms and when the current flowing through the resistor is 7 amperes, find the voltage across a resistor whose resistance is 3 ohms and when the current flowing through the resistor is 5 amperes.

A) 10 volts B) 35 volts C) 21 volts D) 15 volts

Objective: (1.7) Construct a Model Using Joint or Combined Variation

299) The power that a resistor must dissipate is jointly proportional to the square of the current flowing through the resistor and the resistance of the resistor. If a resistor needs to dissipate 441 watts of power when 7 amperes of current is flowing through the resistor whose resistance is 9 ohms, find the power that a resistor needs to dissipate when 6 amperes of current are flowing through a resistor whose resistance is 5 ohms.

A) 210 watts B) 150 watts C) 180 watts D) 30 watts

Objective: (1.7) Construct a Model Using Joint or Combined Variation

300) While traveling in a car, the centrifugal force a passenger experiences as the car drives in a circle varies jointly as the mass of the passenger and the square of the speed of the car. If the a passenger experiences a force of 14.4 newtons when the car is moving at a speed of 20 kilometers per hour and the passenger has a mass of 40 kilograms, find the force a passenger experiences when the car is moving at 40 kilometers per hour and the passenger has a mass of 60 kilograms.

A) 96 newtons B) 112 newtons C) 76.8 newtons D) 86.4 newtons

Objective: (1.7) Construct a Model Using Joint or Combined Variation

301) The volume V of a given mass of gas varies directly as the temperature T and inversely as the pressure P. A measuring device is calibrated to give $V = 126.5\ in^3$ when $T = 230°$ and $P = 20\ lb/in^2$. What is the volume on this device when the temperature is 110° and the pressure is $25\ lb/in^2$?

A) $V = 88.4\ in^3$ B) $V = 4.4\ in^3$ C) $V = 48.4\ in^3$ D) $V = 8.4\ in^3$

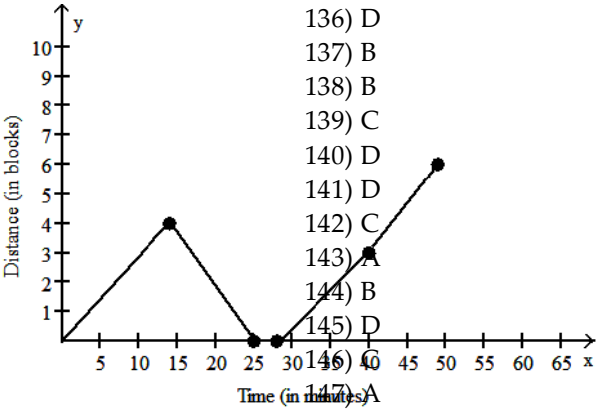
Objective: (1.7) Construct a Model Using Joint or Combined Variation

302) The time in hours it takes a satellite to complete an orbit around the earth varies directly as the radius of the orbit (from the center of the earth) and inversely as the orbital velocity. If a satellite completes an orbit 650 miles above the earth in 13 hours at a velocity of 34,000 mph, how long would it take a satellite to complete an orbit if it is at 1700 miles above the earth at a velocity of 25,000 mph? (Use 3960 miles as the radius of the earth.)

A) 46.24 hours B) 217.07 hours C) 6.52 hours D) 21.71 hours

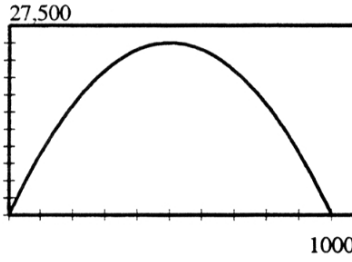
Objective: (1.7) Construct a Model Using Joint or Combined Variation

1) A
2) C
3) A
4) A
5) C
6) A
7) A
8) A
9) A
10) A
11) B
12) B
13) B
14) B
15) A
16) A
17) B
18) A
19) A
20) C
21) C
22) A
23) D
24) A
25) D
26) A
27) C
28) C
29) A
30) B
31) C
32) A
33) D
34) B
35) D
36) D
37) D
38) D
39) D
40) A
41) C
42) C
43) A
44) A
45) C
46) C
47) D
48) C
49) D
50) B
51) D
52) C
53) C
54) C
55) D
56) C
57) A
58) D
59) D
60) A
61) C
62) C
63) C
64) B
65) D
66) C
67) C
68) B
69) D
70) C
71) D
72) A
73) A
74) B
75) A
76) D
77) D
78) B
79) C
80) C
81) D
82) C
83) D
84) A
85) B
86) A
87) A
88) D
89) B
90) A
91) B
92) D
93) B
94) D
95) C
96) D
97) C
98) B
99)



100) B
101) A
102) A
103) A
104) C
105) C
106) B
107) B
108) B
109) A
110) B
111) A
112) A
113) C
114) B
115) C
116) A
117) A
118) B
119) B
120) B
121) B
122) B
123) C
124) B
125) A
126) A
127) C
128) B
129) B
130) C
131) C
132) C
133) D
134) B
135) A
136) D
137) B
138) B
139) C
140) D
141) D
142) C
143) A
144) B
145) D
146) C
147) A
148) local maximum at (0, 6)
local minimum at (2.67, −3.48)
increasing on (−1, 0) and (2.67, 4)
decreasing on (0, 2.67)
149) local maximum at (0, 0)
local minimum at (0.74, −0.33)
increasing on (−2, 0) and (0.74, 2)
decreasing on (0, 0.74)
150) local maximum at (2.34, 1.61)
local minimum at (−1.9, −9.82)
increasing on (−1.9, 2.34)
decreasing on (−4, −1.9) and (2.34, 5)
151) local maximum at (0, 5)
local minima at (−2.55, 1.17) and (1.05, 4.65)
increasing on (−2.55, 0) and (1.05, 2)
decreasing on (−4, −2.55) and (0, 1.05)
152) B
153) B
154) B
155) A
156) A

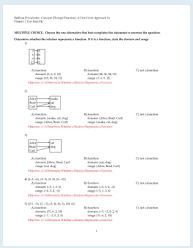
157) B
158) B
159) D
160) B
161) C
162) C
163) D
164) B
165) D
166) A
167) D
168) B
169) C
170) D
171) A
172) D
173) B
174) D
175) D
176) A
177) A
178) A
179) C
180) C
181) A
182) C
183) D
184) A
185) D
186) D
187) D
188) D
189) A
190) D
191) A
192) A
193) D
194) A
195) B
196) B
197) B
198) B
199) D
200) B
201) D
202) A
203) A
204) B
205) A
206) $25.52
$42.69
C(x) =
$\begin{cases} 8.8 + 0.6686x & \text{if} \\ 4.0475 + 0.8587x & \text{if} \end{cases}$
207) $39.70
$49.69
C(x) =
$\begin{cases} 4.93 + 0.11589x & \\ -0.266 + 0.13321x & \end{cases}$
if $0 \le x \le 300$
if $x > 300$
208) $18.00
$24.25
$65.50
209) 6.0°C
210) $27.50
$32.50;
C(x) =
$\begin{cases} 20 & \\ 12.5 + 0.075x & \\ 7.5 + 0.1x & \end{cases}$
if $0 \le x \le 100$
if $100 < x \le 200$
if $x > 200$
211) A
212) A
213) A
214) C
215) B
216) B
217) B
218) D
219) A
220) B
221) D
222) B
223) A
224) A
225) C
226) C
227) B
228) D
229) D
230) D
231) D
232) A
233) A
234) D
235) D
236) A
237) B
238) C
239) D
240) D
241) D
242) B
243) D
244) C
245) A
246) A
247) B
248) A
249) A
250) A
251) B
252) A
253) C
254) C
255) C
256) D
257) A
258) C
259) A
260) B
261) C
262) A
263) D
264) A
265) C
266) A
267) C
268) $A(x) = \frac{1}{2}x^3$
269) C
270) $A(x) = \frac{4\sqrt{3} + 9}{16}x^2 - \frac{15}{2}x + 25;\ \{x \mid 0 \le x \le \frac{20}{3}\}$
271) B
272) $V(s) = \frac{1}{6}s^3$
273) D
274) A
275) C
276) B
277) B
278) B
279) a. $R(x) = -\frac{1}{10}x^2 + 100x$
b. R(450) = $24,750.00
c.



d. 500; $25,000.00
e. $50.00
280) $d(t) = \sqrt{1709t}$
281) B
282) D
283) C
284) A
285) C
286) A
287) D
288) D
289) D
290) C
291) A
292) B
293) D
294) A
295) B
296) B
297) D
298) D
299) C
300) D
301) C
302) D

PAC Test Report

DOCUMENT



Title

Chapter 1 Test Item File

Filename

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Language	Tags	Pages	Size
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RESULT

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2023-12-06 15:57	PDF/UA-1

CHECKPOINT	PASSED	WARNED	FAILED
Basic Requirements			
PDF Syntax	13 670	0	0
Fonts	15	0	0
Content	47 011	0	0
Embedded Files	1	0	0
Natural Language	18 242	0	0
Logical Structure			
Structure Elements	351	0	0
Structure Tree	5 844	0	0
Role Mapping	6 612	0	0
Alternative Descriptions	13 224	0	0
Metadata and Settings			
Metadata	3	0	0
Document settings	3	0	0

ABOUT PAC

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