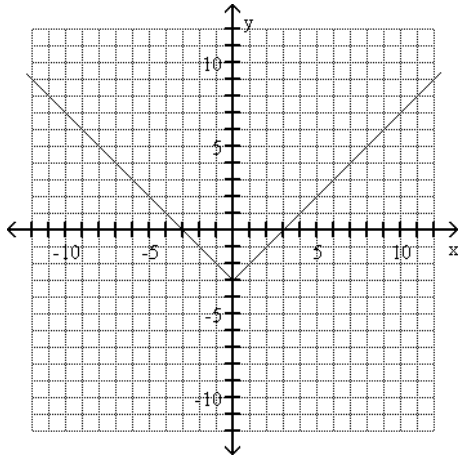
Exam

Name_____

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

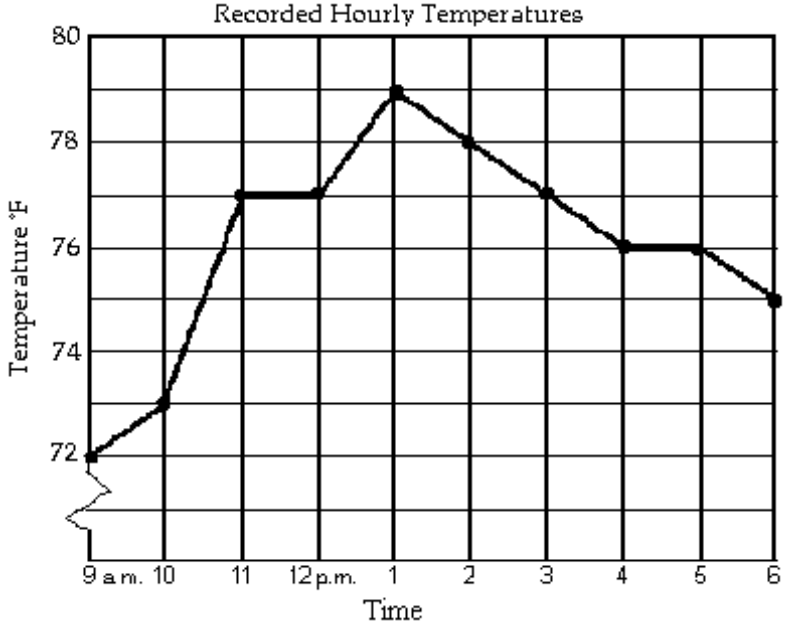
Use the graph to determine the x- and y-intercepts.

1)



A) x-intercepts: -3, 3; y-intercept: 0
B) x-intercepts: -3, 3; y-intercept: -3
C) x-intercepts: -3, 3
D) y-intercept: -3

The line graph shows the recorded hourly temperatures in degrees Fahrenheit at an airport.



2) What temperature was recorded at 4 p.m.?

A) 76 ° F
B) 74 ° F
C) 77 ° F
D) 78 ° F

3) At what time was the temperature its lowest?

A) 1 p.m.
B) 4 p.m.
C) 6 p.m.
D) 9 a.m.

4) What temperature was recorded at 3 p.m.?

A) 78 ° F B) 77 ° F C) 75 ° F D) 79 ° F

5) During which hour did the temperature increase the most?

A) 12 p.m. to 1 p.m. B) 10 a.m. to 11 a.m. C) 1 p.m. to 2 p.m. D) 9 a.m. to 10 a.m.

6) At what time was the temperature 77°?

A) 2 p.m. B) 12 p.m. and 3 p.m.

C) 11 a.m. and 12 p.m. and 3 p.m. D) 11 a.m. and 12 p.m.

7) During which two hour period did the temperature increase the most?

A) 9 a.m. to 11 a.m. B) 12 p.m. to 2 p.m. C) 10 a.m. to 12 p.m. D) 10 a.m. to 11 a.m.

8) At what time was the temperature the highest?

A) 2 p.m. B) 11 a.m. C) 5 p.m. D) 1 p.m.

Give the domain and range of the relation.

9) {(5, -7), (-2, -5), (-6, -4), (-3, 6), (1, -6)}

A) domain = {5, -7, 1, -6, -6}; range = {-4, -3, 6, -2, -5}

B) domain = {5, 1, -6, -3, -2}; range = {-7, -6, -4, 6, -5}

C) domain = {-4, -3, 6, -2, -5}; range = {5, -7, 1, -6, -6}

D) domain = {-7, -6, -4, 6, -5}; range = {5, 1, -6, -3, -2}

Determine whether the relation is a function.

10) {(-4, 3), (-2, -9), (1, 7), (1, -8)}

A) Function B) Not a function

11) {(2, 3), (2, -8), (6, -3), (8, -4), (10, -7)}

A) Not a function B) Function

Evaluate the function at the given value of the independent variable and simplify.

12) $f(x) = -3x - 8$; $f(-2)$

A) -2 B) 22 C) -11 D) 14

13) $f(x) = 4x^2 + 2x + 6$; $f(x - 1)$

A) $4x^2 - 6x + 12$ B) $4x^2 + 26x + 12$ C) $-6x^2 + 4x + 8$ D) $4x^2 - 6x + 8$

14) $h(x) = |x - 5|$; $h(15)$

A) -20 B) 10 C) 20 D) -10

15) $f(x) = \sqrt{x + 13}$; $f(-4)$

A) 1.73 B) -3 C) 3 D) not a real number

16) $f(x) = \dfrac{x^3 + 7}{x^2 + 5}$; $f(-1)$

A) $\dfrac{4}{3}$ B) 6 C) 1 D) $-\dfrac{1}{6}$

Solve the problem.

17) The function P(x) = 0.35x - 81 models the relationship between the number of pretzels x that a certain vendor sells and the profit the vendor makes. Find P(1000), the profit the vendor makes from selling 1000 pretzels.

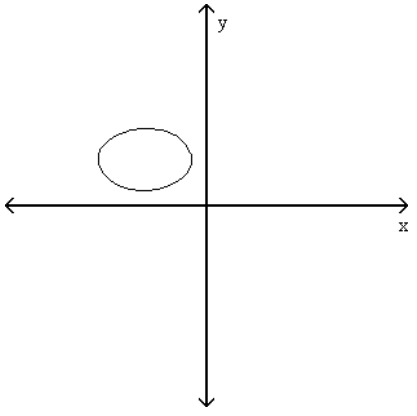
A) $269 B) $919 C) $431 D) $350

18) The total cost in dollars for a certain company to produce x empty jars to be used by a jelly producer is given by the function C(x) = 0.7x + 29,000. Find C(70,000), the cost of producing 70,000 jars.

A) $70,029 B) $29.70 C) $78,000 D) $49,000

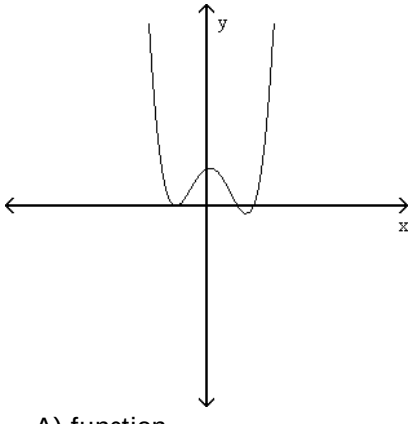
Use the vertical line test to determine whether or not the graph is a graph in which y is a function of x.

19)



A) function B) not a function

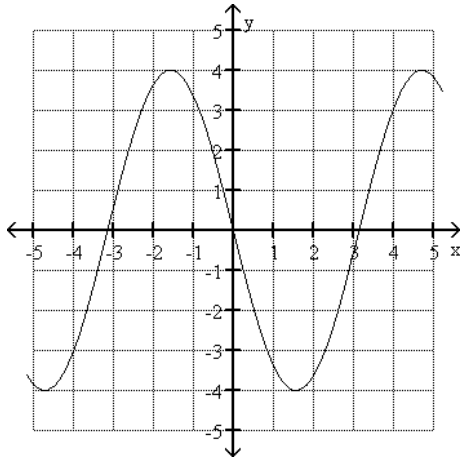
20)



A) function B) not a function

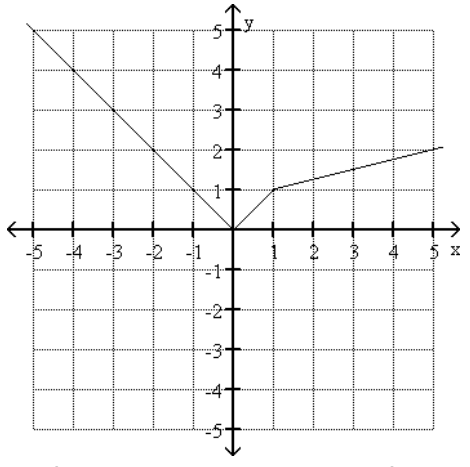
Use the graph to find the indicated function value.

21) y = f(x). Find f(-2)



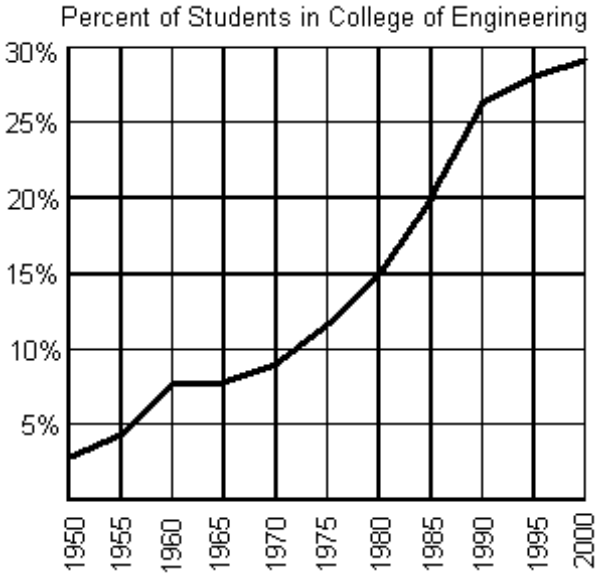
A) -3.6 B) 3.6 C) 0.5 D) -0.5

22) y = f(x). Find f(5).



A) 17 B) -5 C) 2 D) 5

The graph below shows the percentage of students enrolled in the College of Engineering at State University. Use the graph to answer the question.



23) Does the graph represent a function?

A) yes B) no

24) If f represents the function, find f(1965).

A) approximately 2.5% B) approximately 7.5%

C) approximately 9.5% D) approximately 4%

25) If f represents the function, find f(1975).

A) approximately 8.5% B) approximately 7%

C) approximately 12% D) approximately 14%

26) If f(x) = 20%, what year is represented by x?

A) 1985 B) 1980 C) 1975 D) 1990

27) If f(x) = 26%, what year is represented by x?

A) 1985 B) 1990 C) 1980 D) 1995

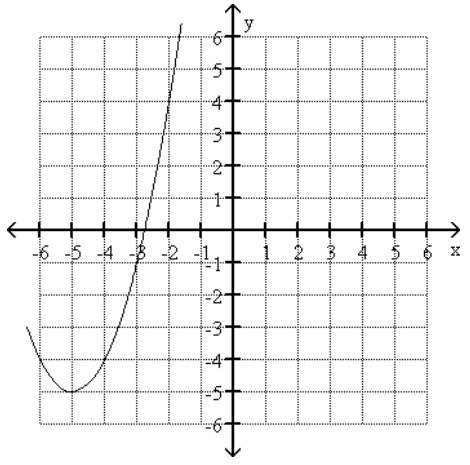
28) Between what two years is the difference in function values equal to 5%?

A) between 1980 and 1985 B) between 1960 and 1965

C) between 1970 and 1975 D) between 1985 and 1990

Use the graph to determine the function's domain and range.

29)



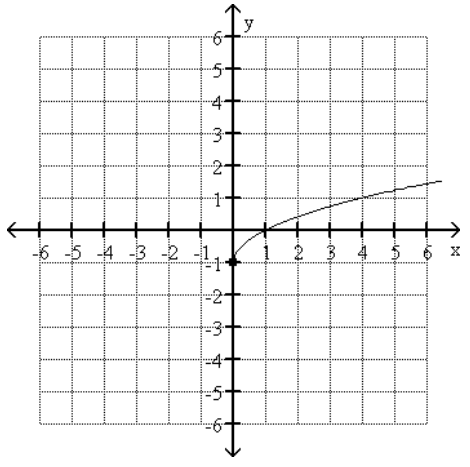
A) domain: $(-\infty, -5)$ or $(-5, \infty)$
range: $(-\infty, -5)$ or $(-5, \infty)$

B) domain: $[-5, \infty)$
range: $[-5, \infty)$

C) domain: $(-\infty, \infty)$
range: $(-\infty, \infty)$

D) domain: $(-\infty, \infty)$
range: $[-5, \infty)$

30)



A) domain: $[0, \infty)$
range: $[-1, \infty)$

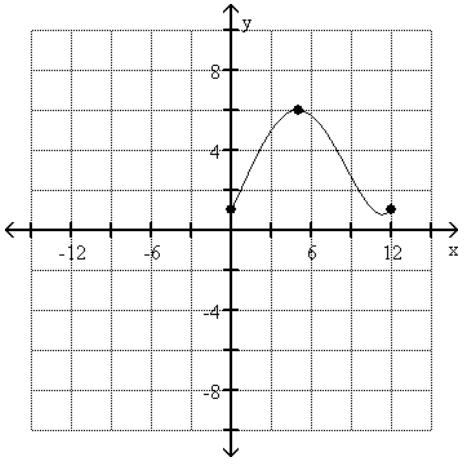
B) domain: $[0, \infty)$
range: $[0, \infty)$

C) domain: $[0, \infty)$
range: $(-\infty, \infty)$

D) domain: $(-\infty, \infty)$
range: $[-1, \infty)$

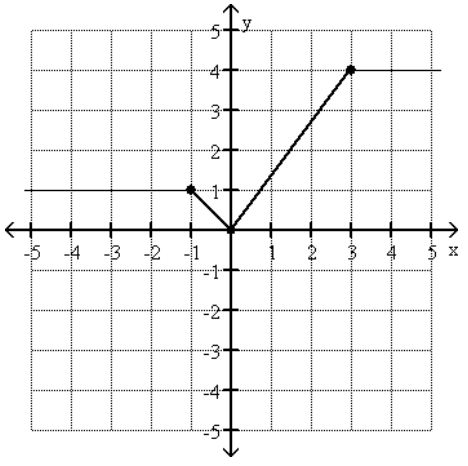
Identify the intervals where the function is changing as requested.

31) Increasing



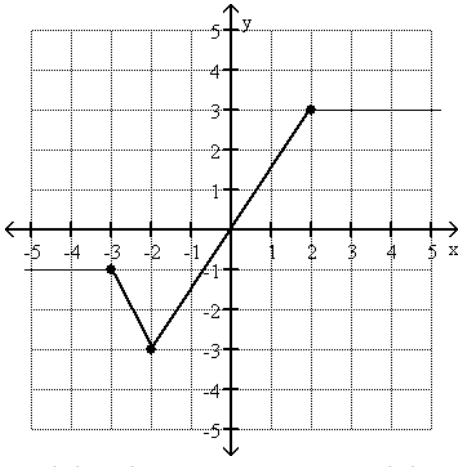
A) (1, 5) B) (0, 5) C) (0, 6) D) (1, 6)

32) Constant



A) (-∞, -1) or (3, ∞) B) (3, ∞) C) (-1, 0) D) (-∞, 0)

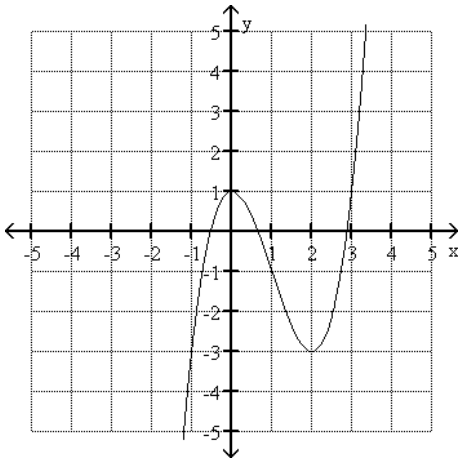
33) Decreasing



A) (0, -2) B) (-3, -2) C) (-∞, -2) D) (-∞, -3)

Use the graph of the given function to find any relative maxima and relative minima.

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



A) maximum: (0, 1); minimum: none
B) maximum: none; minimum: (2, -3)
C) no maximum or minimum
D) maximum: (0, 1); minimum: (2, -3)

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

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

A) Even
B) Odd
C) Neither

36) $f(x) = 5x^2 + x^4$

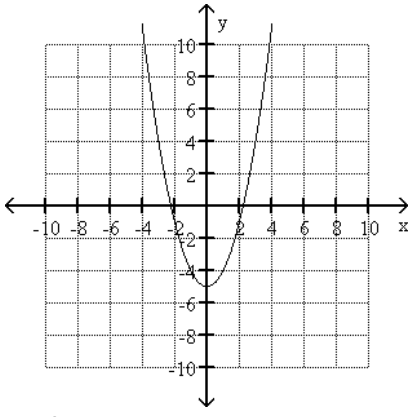
A) Even
B) Neither
C) Odd

37) $f(x) = x^5 - x^4$

A) Neither
B) Odd
C) Even

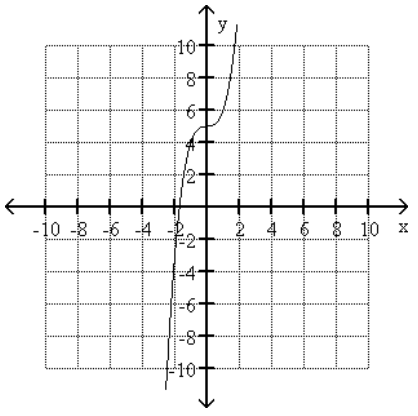
Use possible symmetry to determine whether the graph is the graph of an even function, an odd function, or a function that is neither even nor odd.

38)



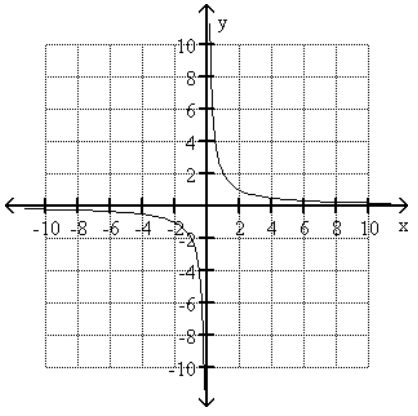
A) Even
B) Neither
C) Odd

39)



A) Neither B) Even C) Odd

40)



A) Neither B) Odd C) Even

Evaluate the piecewise function at the given value of the independent variable.

41) $f(x) = \begin{cases} 5x - 3 & \text{if } x < -4 \\ 3x - 5 & \text{if } x \geq -4 \end{cases}$; $f(-3)$

A) -20 B) -17 C) -14 D) -12

42) $g(x) = \begin{cases} \dfrac{x^2 - 6}{x + 5} & \text{if } x \neq -5 \\ x + 6 & \text{if } x = -5 \end{cases}$; $g(2)$

A) $-\dfrac{2}{7}$ B) 2 C) $-\dfrac{4}{7}$ D) 8

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

43) $f(x) = 6x + 7$

A) 6 B) $6 + \dfrac{12(x + 7)}{h}$ C) $6 + \dfrac{14}{h}$ D) 0

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

A) 1

B) $\frac{2x^2 + 2x + 2xh + h^2 + h - 14}{h}$

C) $2x + h - 7$

D) $2x + h + 9$

Given functions f and g, perform the indicated operations.

45) $f(x) = 7x - 9$, $g(x) = 2x - 4$

Find $f - g$.

A) $9x - 13$ B) $-5x + 5$ C) $5x - 13$ D) $5x - 5$

46) $f(x) = 4x^2 - 7x$, $g(x) = x^2 - 5x - 14$

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

A) $\frac{4x^2 - 7x}{x^2 - 5x - 14}$ B) $\frac{4 - x}{14}$ C) $\frac{4x}{x + 1}$ D) $\frac{4x - 7}{-5}$

Given functions f and g, determine the domain of $f + g$.

47) $f(x) = 3x - 7$, $g(x) = 3x + 4$

A) $(0, \infty)$ B) $(-\infty, 0)$ or $(0, \infty)$ C) $(-\infty, \infty)$ D) $(-\infty, -3)$ or $(-3, \infty)$

48) $f(x) = \frac{4x}{x - 8}$, $g(x) = \frac{5}{x + 2}$

A) $(-\infty, -2)$ or $(-2, 8)$ or $(8, \infty)$

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

C) $(-\infty, -5)$ or $(-5, -4)$ or $(-4, \infty)$

D) $(-\infty, -8)$ or $(-8, 2)$ or $(2, \infty)$

Find the domain of the indicated combined function.

49) Find the domain of $(f - g)(x)$ when $f(x) = 8x - 4$ and $g(x) = 6x - 2$.

A) Domain: $(-\infty, \infty)$ B) Domain: $(-4, \infty)$ C) Domain: $(-4, 8)$ D) Domain: $(-8, 4)$

50) Find the domain of $(f + g)(x)$ when $f(x) = 9 - 2x$ and $g(x) = -7x + 9$.

A) Domain: $(-\infty, \infty)$ B) Domain: $(-9, 2)$ C) Domain: $(-2, \infty)$ D) Domain: $(-\infty, 7)$

For the given functions f and g , find the indicated composition.

51) $f(x) = 20x^2 - 5x$, $g(x) = 14x - 3$

$(f \circ g)(2)$

A) 11,398 B) 12,375 C) 977 D) 1750

52) $f(x) = 3x + 7$, $g(x) = 2x - 1$

$(f \circ g)(x)$

A) $6x + 6$ B) $6x + 13$ C) $6x + 4$ D) $6x + 10$

53) $f(x) = \frac{4}{x + 6}$, $g(x) = \frac{7}{8x}$

$(f \circ g)(x)$

A) $\frac{7x + 42}{32x}$ B) $\frac{32x}{7 - 48x}$ C) $\frac{32x}{7 + 48x}$ D) $\frac{4x}{7 + 48x}$

54) $f(x) = 4x^2 + 2x + 5, \quad g(x) = 2x - 4$

$(g \circ f)(x)$

A) $4x^2 + 2x + 1$ B) $4x^2 + 4x + 6$ C) $8x^2 + 4x + 6$ D) $8x^2 + 4x + 14$

Find the domain of the composite function $f \circ g$.

55) $f(x) = 4x + 40, \quad g(x) = x + 3$

A) $(-\infty, -13)$ or $(-13, \infty)$ B) $(-\infty, 13)$ or $(13, \infty)$

C) $(-\infty, \infty)$ D) $(-\infty, -10)$ or $(-10, -3)$ $(-3, \infty)$

Determine which two functions are inverses of each other.

56) $f(x) = \frac{x - 6}{4}$ $g(x) = 4x - 6$ $h(x) = \frac{x + 6}{4}$

A) f(x) and g(x) B) None C) f(x) and h(x) D) g(x) and h(x)

57) $f(x) = x^3 - 4$ $g(x) = \sqrt[3]{x - 4}$ $h(x) = x^3 + 4$

A) f(x) and h(x) B) f(x) and g(x) C) g(x) and h(x) D) None

Find the inverse of the one-to-one function.

58) $f(x) = \frac{5}{7x - 8}$

A) $f^{-1}(x) = \frac{7x - 8}{5}$ B) $f^{-1}(x) = \frac{5}{7y} + \frac{8}{7}$

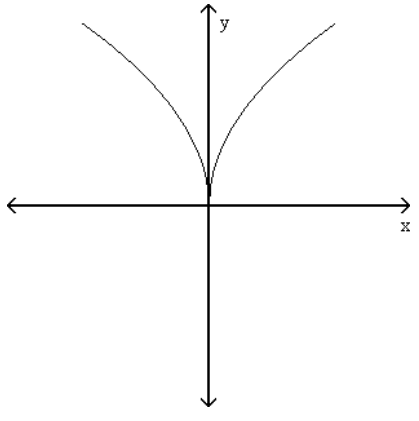
C) $f^{-1}(x) = -\frac{8}{7} - \frac{5}{7x}$ D) $f^{-1}(x) = \frac{5}{7x} + \frac{8}{7}$

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

A) $f^{-1}(x) = \sqrt{x} - 3$ B) $f^{-1}(x) = \sqrt[3]{x} - 3$ C) $f^{-1}(x) = \sqrt[3]{x} + 3$ D) $f^{-1}(x) = \sqrt[3]{x} - 27$

Does the graph represent a function that has an inverse function?

60)

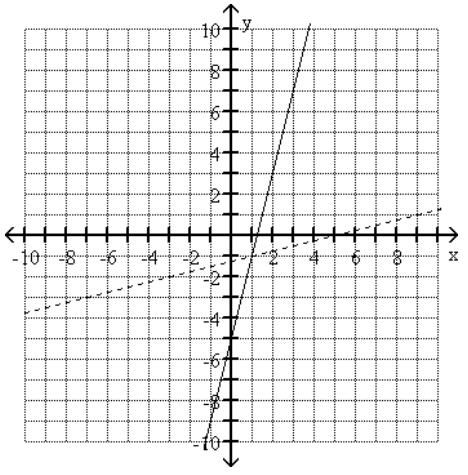


A) No B) Yes

Graph f as a solid line and f^{-1} as a dashed line in the same rectangular coordinate space. Use interval notation to give the domain and range of f and f^{-1}.

61) f(x) = 4x - 5

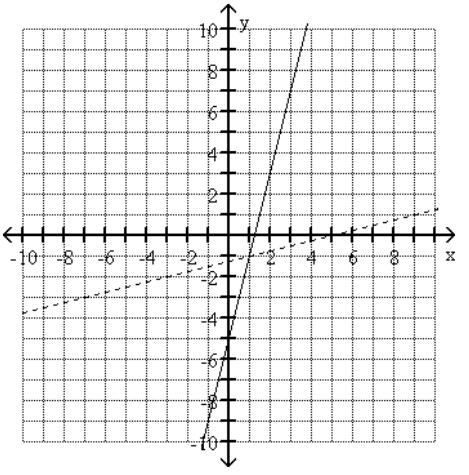
A)



f domain = (-10, 10); range = (-10, 10)

f^{-1} domain = (-10, 10); range = (-10, 10)

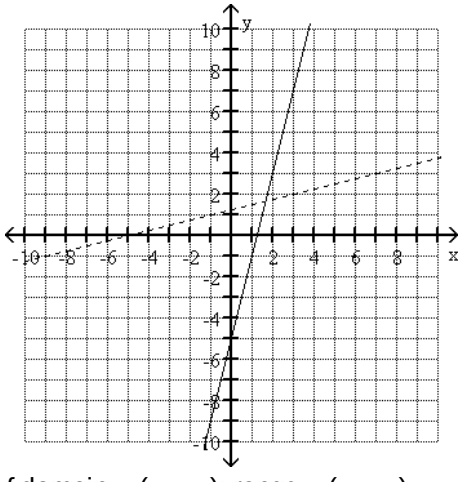
B)



f domain = (-∞, ∞); range = (-∞, ∞)

f^{-1} domain = (-∞, ∞); range = (-∞, ∞)

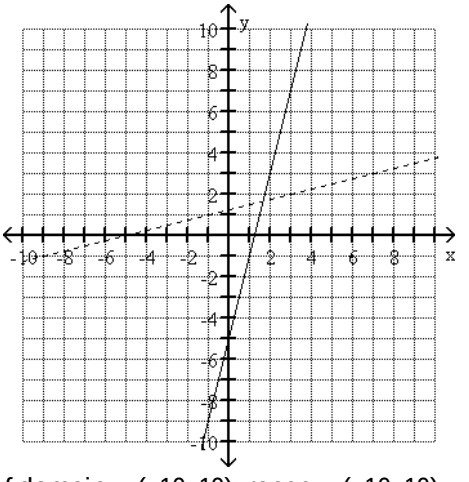
C)



f domain = (-∞, ∞); range = (-∞, ∞)

f^{-1} domain = (-∞, ∞); range = (-∞, ∞)

D)

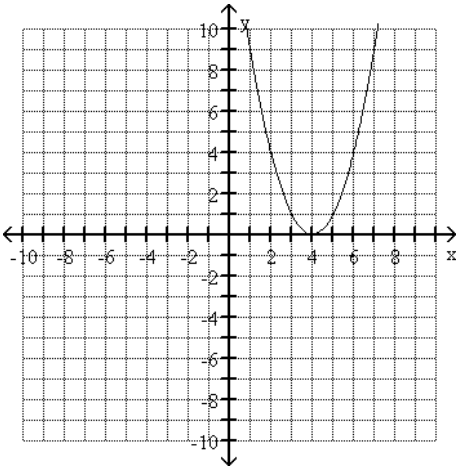


f domain = (-10, 10); range = (-10, 10)

f^{-1} domain = (-10, 10); range = (-10, 10)

62) $f(x) = (x - 4)^2$, $x \geq 4$

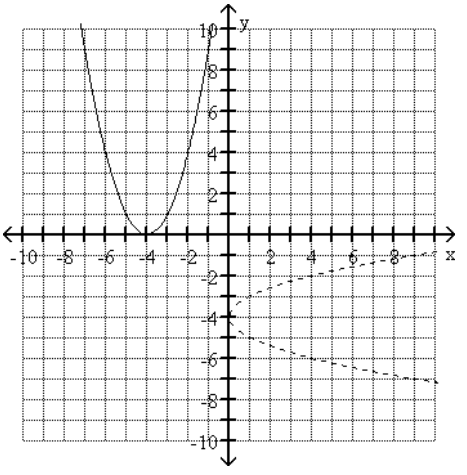
A)



Has no inverse

f domain = $(-\infty, \infty)$; range = $(0, \infty)$

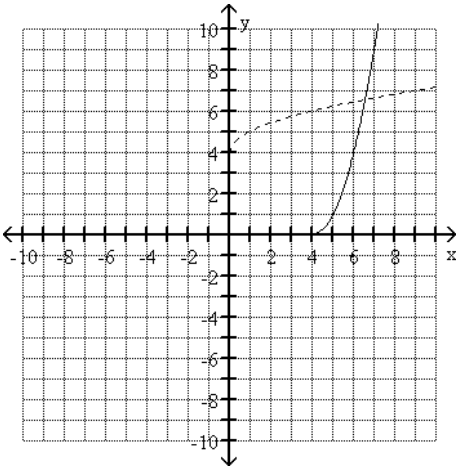
B)



f domain = $(-\infty, \infty)$; range = $(0, \infty)$

f^{-1} domain = $(0, \infty)$; range = $(-\infty, \infty)$

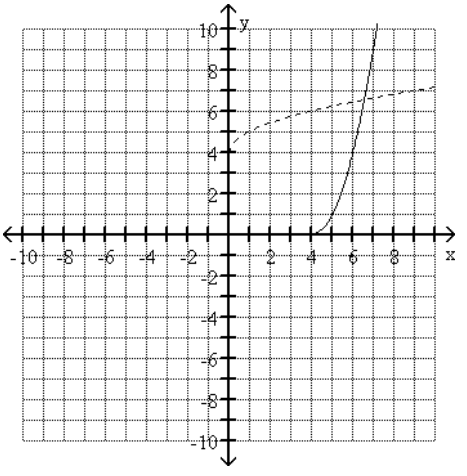
C)



f domain = $(-\infty, \infty)$; range = $(0, \infty)$

f^{-1} domain = $(0, \infty)$; range = $(-\infty, \infty)$

D)

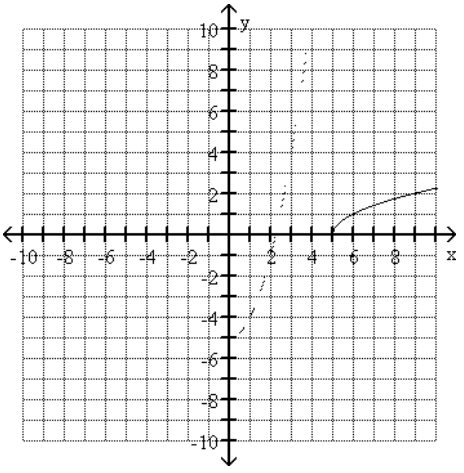


f domain = $(4, \infty)$; range = $(0, \infty)$

f^{-1} domain = $(0, \infty)$; range = $(4, \infty)$

63) $f(x) = \sqrt{x - 5}$

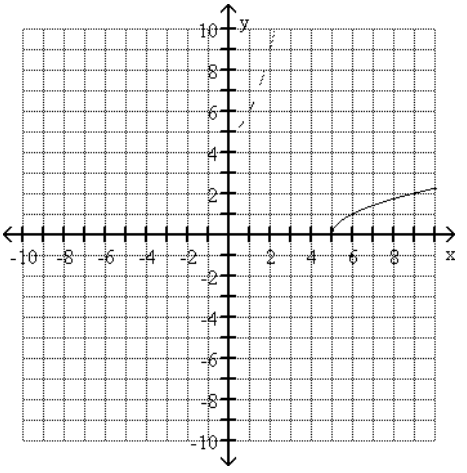
A)



f domain = (0, ∞); range = (5, ∞)

f^{-1} domain = (-5, ∞); range = (0, ∞)

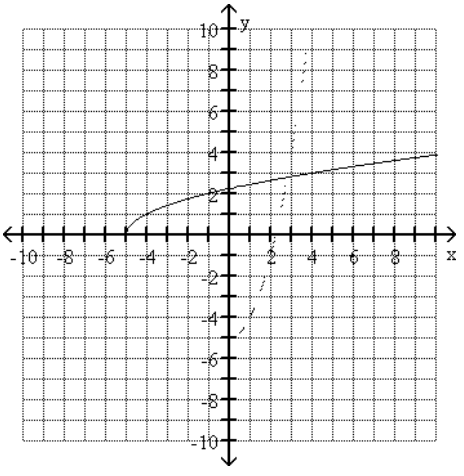
B)



f domain = (0, ∞); range = (5, ∞)

f^{-1} domain = (5, ∞); range = (0, ∞)

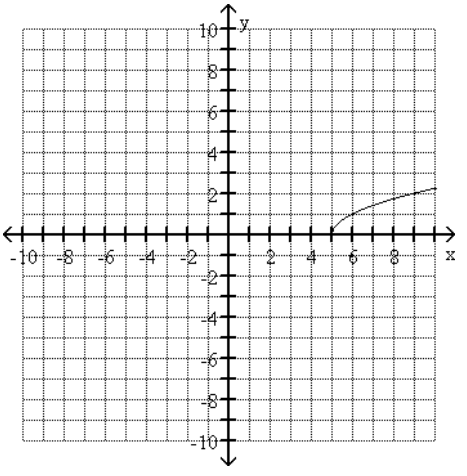
C)



f domain = (0, ∞); range = (-5, ∞)

f^{-1} domain = (-5, ∞); range = (0, ∞)

D)



f domain = (0, ∞); range = (5, ∞)

f^{-1} Has no inverse.

Write the standard form of the equation of the circle with the given center and radius.

64) (8, -3); 9

A) $(x + 3)^2 + (y - 8)^2 = 9$

B) $(x - 8)^2 + (y + 3)^2 = 81$

C) $(x + 8)^2 + (y - 3)^2 = 81$

D) $(x - 3)^2 + (y + 8)^2 = 9$

Find the center and the radius of the circle.

65) $(x + 8)^2 + (y - 1)^2 = 4$

A) (8, -1), r = 4

B) (-1, 8), r = 4

C) (-8, 1), r = 2

D) (1, -8), r = 2

Complete the square and write the equation in standard form. Then give the center and radius of the circle.

66) $x^2 - 2x + 1 + y^2 - 6y + 9 = 25$

A) $(x - 1)^2 + (y - 3)^2 = 25$
(1, 3), r = 5

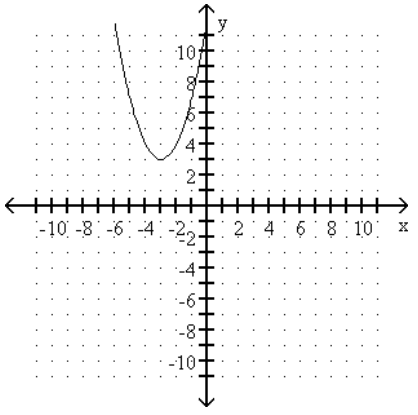
B) $(x - 1)^2 + (y - 3)^2 = 25$
(-1, -3), r = 25

C) $(x - 3)^2 + (y - 1)^2 = 25$
(-3, -1), r = 25

D) $(x - 3)^2 + (y - 1)^2 = 25$
(3, 1), r = 5

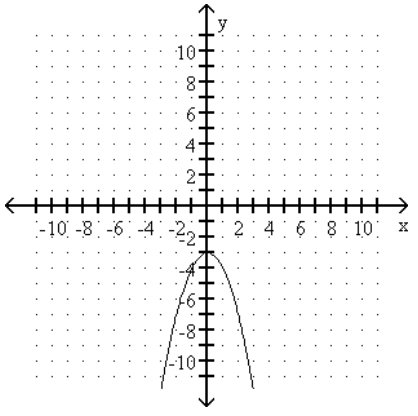
The graph of a quadratic function is given. Determine the function's equation.

67)



A) $f(x) = (x + 3)^2 + 3$ B) $g(x) = (x + 3)^2 - 3$ C) $j(x) = (x - 3)^2 - 3$ D) $h(x) = (x - 3)^2 + 3$

68)



A) $j(x) = -x^2 + 3$ B) $g(x) = -x^2 + 6x + 9$ C) $h(x) = -x^2 - 3$ D) $f(x) = -x^2 - 6x - 9$

Find the coordinates of the vertex for the parabola defined by the given quadratic function.

69) $f(x) = 7 - (x + 4)^2$

A) (7, -4) B) (7, 4) C) (-4, 7) D) (4, 7)

70) $f(x) = -x^2 + 12x - 6$

A) (12, -6) B) (-6, -42) C) (-6, -114) D) (6, 30)

Find the axis of symmetry of the parabola defined by the given quadratic function.

71) $f(x) = x^2 - 12x - 8$

A) x = 6 B) x = -44 C) x = -12 D) x = -6

Find the x-intercepts (if any) for the graph of the quadratic function.

72) $f(x) = (x - 1)^2 - 1$

A) (0, 0) and (-2, 0) B) (0, 0) and (2, 0) C) (0, 0) and (-1, 0) D) (-2, 0) and (2, 0)

73) $f(x) = 10 + 7x + x^2$

A) (2, 0) and (-5, 0) B) (-2, 0) and (5, 0) C) (2, 0) and (5, 0) D) (-2, 0) and (-5, 0)

Find the y-intercept for the graph of the quadratic function.

74) $f(x) = -x^2 - 2x + 8$

A) (8, 0) B) (0, 8) C) (0, -8) D) (0, -4)

Solve the problem.

75) Write an equation in standard form of the parabola that has the same shape as the graph of $f(x) = 11x^2$, but which has its vertex at (3, 9).

A) $f(x) = (11x + 3)^2 + 9$ B) $f(x) = 11(x + 3)^2 + 9$ C) $f(x) = 11(x + 9)^2 + 3$ D) $f(x) = 11(x - 3)^2 + 9$

76) Write an equation in standard form of the parabola that has the same shape as the graph of $f(x) = 5x^2$, but which has a minimum of 6 at $x = 2$.

A) $f(x) = 5(x - 2)^2 + 6$ B) $f(x) = 5(x + 6)^2 - 2$

C) $f(x) = -5(x - 2)^2 + 6$ D) $f(x) = 5(x + 2)^2 + 6$

77) Write an equation in standard form of the parabola that has the same shape as the graph of $f(x) = -7x^2$, but which has a maximum of 5 at $x = 4$.

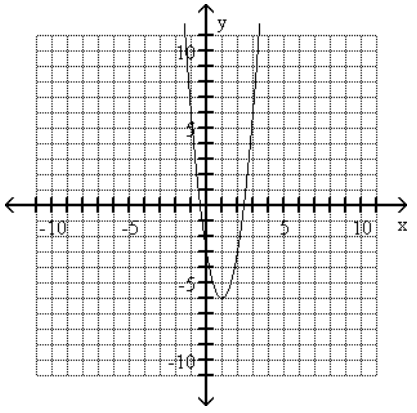
A) $f(x) = -7(x - 4)^2 + 5$ B) $f(x) = -7(x + 4)^2 + 5$

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

Use the vertex and intercepts to sketch the graph of the quadratic function.

78) $f(x) = 3(x + 6)^2 + 1$

A)



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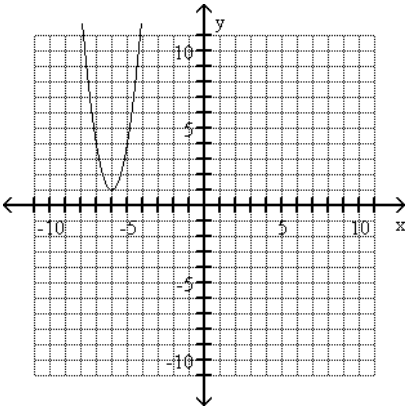
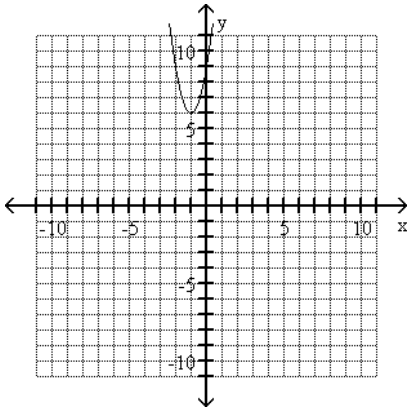
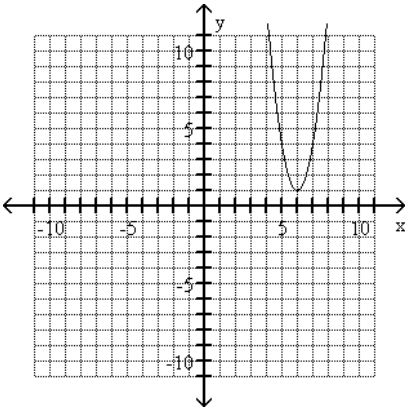


C)

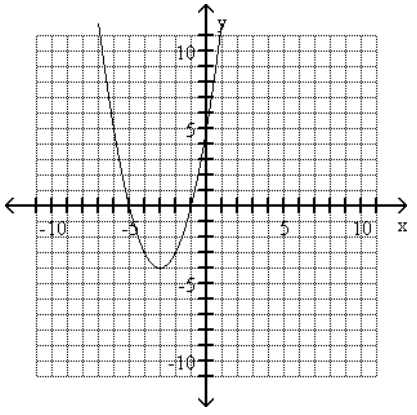


D)

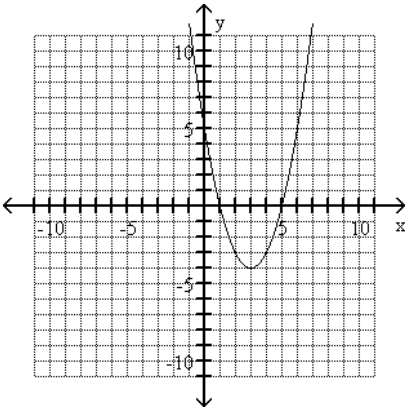


79) $f(x) = x^2 + 6x + 5$

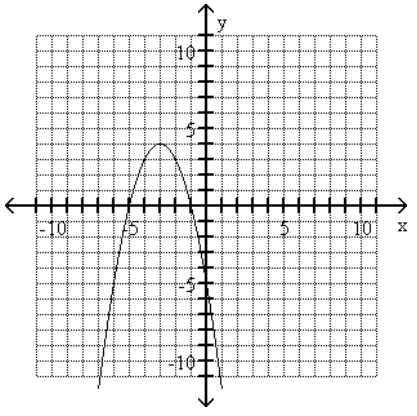
A)



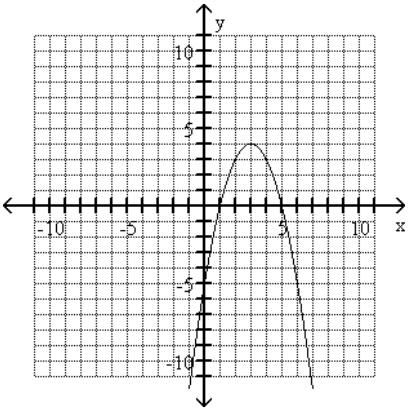
B)



C)



D)



Determine whether the given quadratic function has a minimum value or maximum value. Then find the coordinates of the minimum or maximum point.

80) $f(x) = x^2 - 2x - 6$

A) minimum; $(-7, 1)$ B) minimum; $(1, -7)$ C) maximum; $(1, -7)$ D) maximum; $(-7, 1)$

Find the y-intercept of the polynomial function.

81) $f(x) = (x + 1)(x - 4)(x - 1)^2$

A) -1 B) -4 C) 0 D) 4

Use the Leading Coefficient Test to determine the end behavior of the polynomial function.

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

A) rises to the left and falls to the right
B) rises to the left and rises to the right
C) falls to the left and rises to the right
D) falls to the left and falls to the right

83) $f(x) = (x + 2)(x + 3)(x + 5)^3$

A) falls to the left and falls to the right
B) rises to the left and rises to the right
C) rises to the left and falls to the right
D) falls to the left and rises to the right

Find the zeros for the polynomial function and give the multiplicity for each zero. State whether the graph crosses the x-axis or touches the x-axis and turns around, at each zero.

84) $f(x) = 5(x - 5)(x + 3)^2$

A) 5, multiplicity 1, touches x-axis and turns around; -3, multiplicity 2, crosses x-axis
B) -5, multiplicity 1, touches x-axis and turns around; 3, multiplicity 2, crosses x-axis
C) 5, multiplicity 1, crosses x-axis; -3, multiplicity 2, touches x-axis and turns around
D) -5, multiplicity 1, crosses x-axis; 3, multiplicity 2, touches x-axis and turns around

Use the Intermediate Value Theorem to determine whether the polynomial function has a real zero between the given integers.

85) $f(x) = -2x^3 + 10x^2 - 3x - 8$; between 1 and 2

A) f(1) = 3 and f(2) = -10; yes
B) f(1) = -3 and f(2) = -10; no
C) f(1) = 3 and f(2) = 10; no
D) f(1) = -3 and f(2) = 10; yes

86) $f(x) = 2x^3 + 5x + 9$; between -2 and -1

A) f(-2) = 17 and f(-1) = -2; yes
B) f(-2) = -17 and f(-1) = -2; no
C) f(-2) = 17 and f(-1) = 2; no
D) f(-2) = -17 and f(-1) = 2; yes

Use synthetic division and the Remainder Theorem to find the indicated function value.

87) $f(x) = x^4 + 7x^3 + 3x^2 + 9x - 6$; f(-4)

A) -186
B) -442
C) 744
D) 186

Solve the problem.

88) Use synthetic division to divide $f(x) = x^3 + 15x^2 + 71x + 105$ by x + 7. Use the result to find all zeros of f.

A) {7, 3, 5}
B) {7, -3, -5}
C) {-7, -3, -5}
D) {-7 , 3, 5}

89) Solve the equation $3x^3 - 28x^2 + 69x - 20 = 0$ given that 5 is a zero of $f(x) = 3x^3 - 28x^2 + 69x - 20$.

A) $\left\{5, -4, -\frac{1}{3}\right\}$
B) $\left\{5, 4, \frac{1}{3}\right\}$
C) $\left\{5, -1, -\frac{4}{3}\right\}$
D) $\left\{5, 1, \frac{4}{3}\right\}$

Use synthetic division to show that the number given to the right of the equation is a solution of the equation, then solve the polynomial equation.

90) $2x^3 + 3x^2 - 14x - 15 = 0$; -3

A) $\left\{-\frac{5}{2}, -1, -3\right\}$
B) $\left\{\frac{5}{2}, -1, -3\right\}$
C) $\left\{-\frac{1}{2}, 5, -3\right\}$
D) $\left\{\frac{5}{2}, 1, -3\right\}$

Use the Rational Zero Theorem to list all possible rational zeros for the given function.

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

A) $\pm\frac{1}{2}, \pm 1, \pm 2, \pm 4$
B) $\pm\frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8$
C) $\pm\frac{1}{8}, \pm\frac{1}{4}, \pm\frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8$
D) $\pm\frac{1}{4}, \pm\frac{1}{2}, \pm 1, \pm 2, \pm 4, \pm 8$

Find a rational zero of the polynomial function and use it to find all the zeros of the function.

92) $f(x) = x^3 - 8x^2 + 16x - 8$

A) $\{2, 6 + \sqrt{8}, 6 - \sqrt{8}\}$
B) {1, -1, 8}
C) $\{-2, 6 + \sqrt{5}, 6 - \sqrt{5}\}$
D) $\{2, 3 + \sqrt{5}, 3 - \sqrt{5}\}$

93) $f(x) = x^4 + 3x^3 - 5x^2 - 9x - 2$

A) $\{-1, 3, -2 + \sqrt{5}, -2 - \sqrt{5}\}$ B) $\{-1, 2, -2 + \sqrt{3}, -2 - \sqrt{3}\}$

C) $\{1, -2, -2 + \sqrt{3}, -2 - \sqrt{3}\}$ D) $\{-1, -2, -2 + \sqrt{5}, -2 - \sqrt{5}\}$

Use Descartes's Rule of Signs to determine the possible number of positive and negative real zeros for the given function.

94) $f(x) = -5x^7 + x^3 - x^2 + 9$

A) 3 or 1 positive zeros, 2 or 0 negative zeros B) 2 or 0 positive zeros, 3 or 1 negative zeros

C) 3 or 1 positive zeros, 3 or 1 negative zeros D) 2 or 0 positive zeros, 2 or 0 negative zeros

Find the domain of the rational function.

95) $g(x) = \dfrac{8x^2}{(x + 9)(x - 2)}$

A) $\{x | x \neq 9, x \neq -2\}$ B) $\{x | x \neq -9, x \neq 2, x \neq -8\}$

C) $\{x | x \neq -9, x \neq 2\}$ D) all real numbers

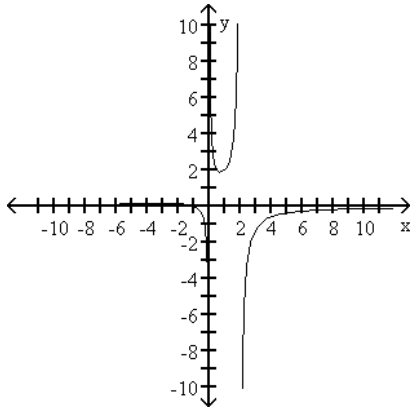
96) $h(x) = \dfrac{x + 7}{x^2 + 36x}$

A) $\{x | x \neq 0, x \neq -36\}$ B) $\{x | x \neq -6, x \neq 6\}$

C) all real numbers D) $\{x | x \neq -6, x \neq 6, x \neq -7\}$

Use the graph of the rational function shown to complete the statement.

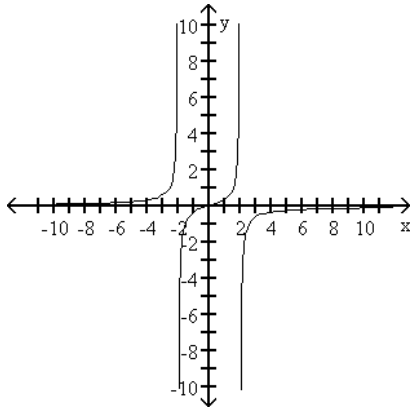
97)



As $x \to -\infty$, $f(x) \to$?

A) $-\infty$ B) $+\infty$ C) -1 D) 0

98)



As $x \to -2^+$, $f(x) \to$?

A) $+\infty$ B) $-\infty$ C) -2 D) 0

Find the vertical asymptotes, if any, of the graph of the rational function.

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

A) $x = 4$ and $x = 4$ B) $x = 4$

C) $x = 0$ and $x = 4$ D) no vertical asymptote

Find the horizontal asymptote, if any, of the graph of the rational function.

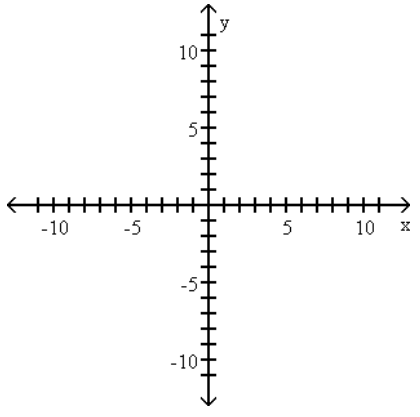
100) $g(x) = \dfrac{10x^2}{2x^2 + 1}$

A) $y = \dfrac{1}{5}$ B) $y = 0$

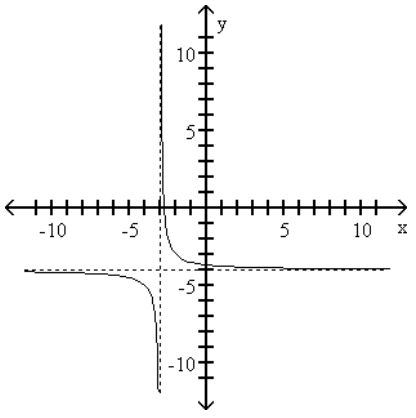
C) $y = 5$ D) no horizontal asymptote

Use transformations of $f(x) = \dfrac{1}{x}$ or $f(x) = \dfrac{1}{x^2}$ to graph the rational function.

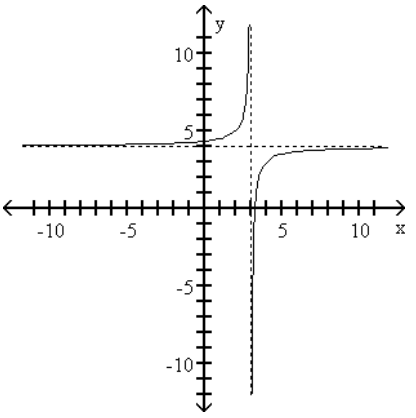
101) $f(x) = \dfrac{1}{x - 3} + 4$



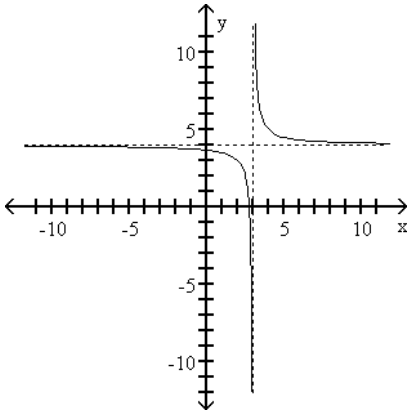
A)



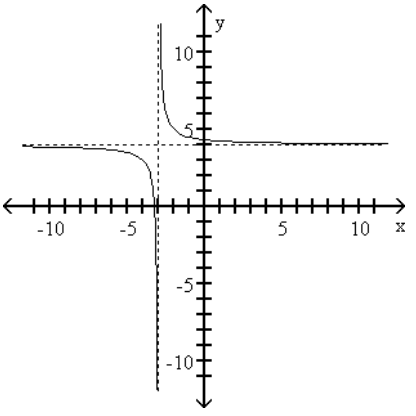
B)



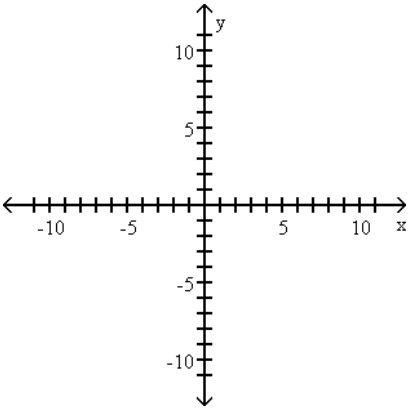
C)



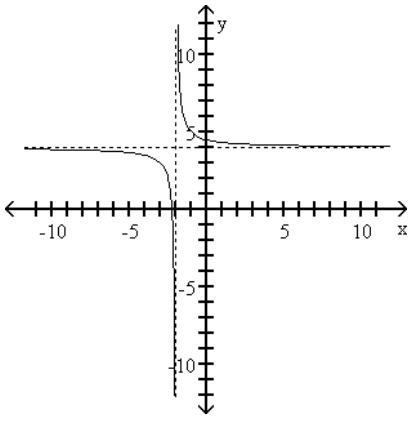
D)



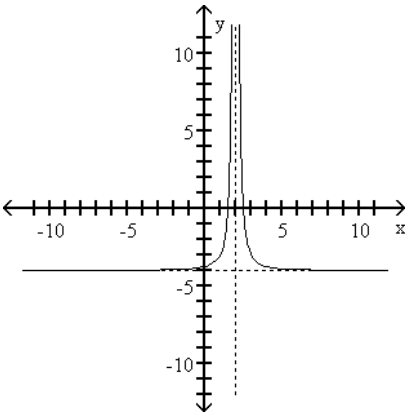
102) $f(x) = \frac{1}{(x + 2)^2} + 4$



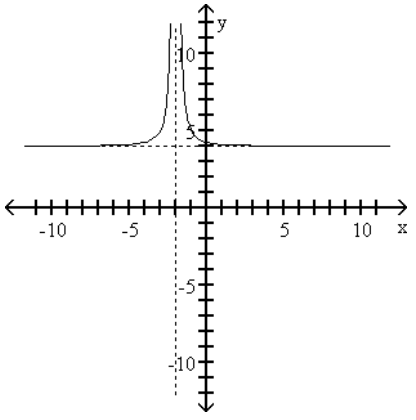
A)



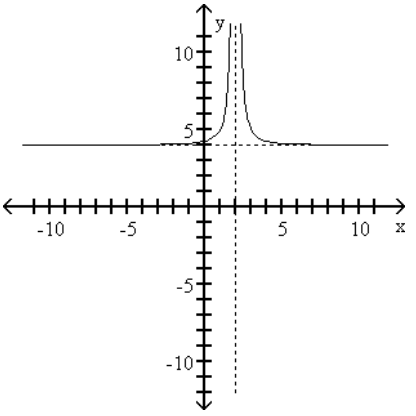
B)



C)

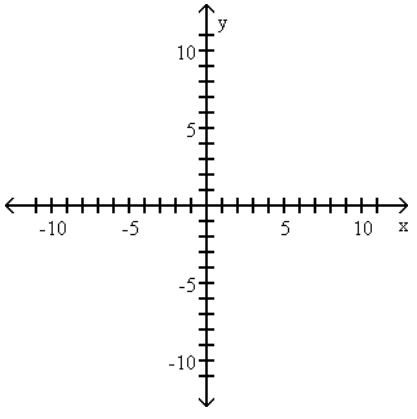


D)

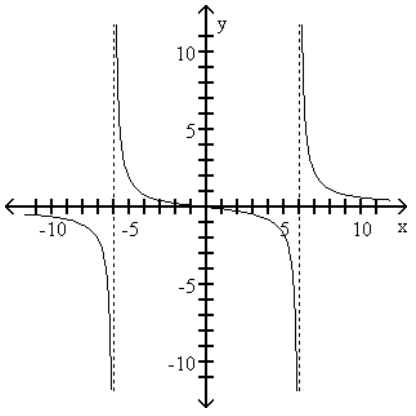


Graph the rational function.

103) $f(x) = \dfrac{4x}{x^2 - 36}$



A)



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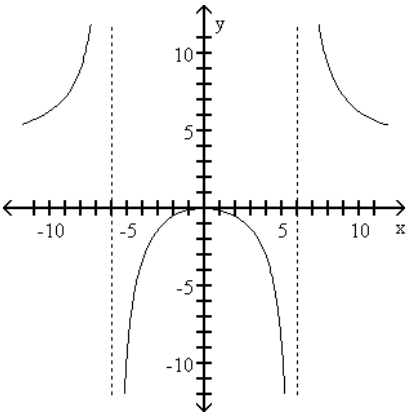

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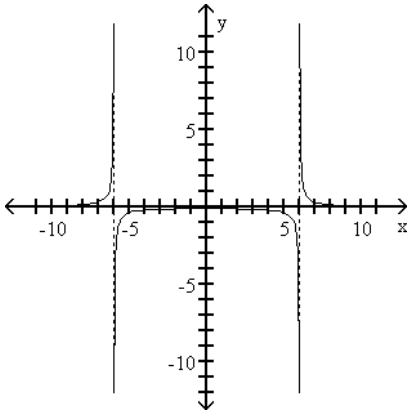
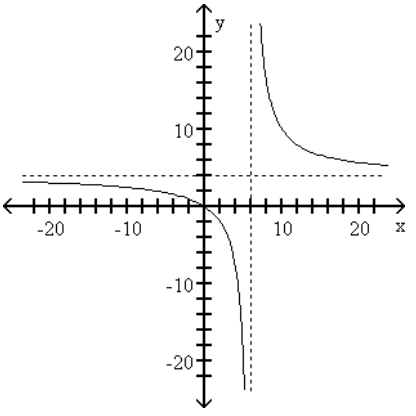
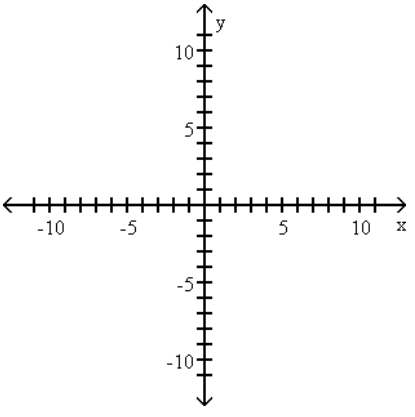


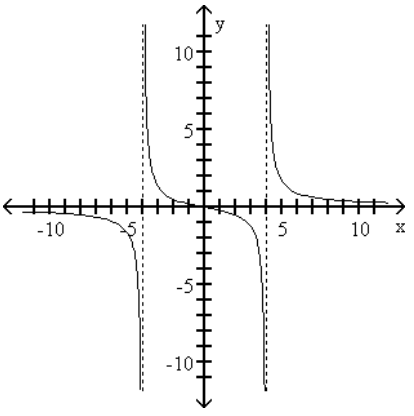
D)



104) $f(x) = -\dfrac{3}{x^2 - 16}$



A)



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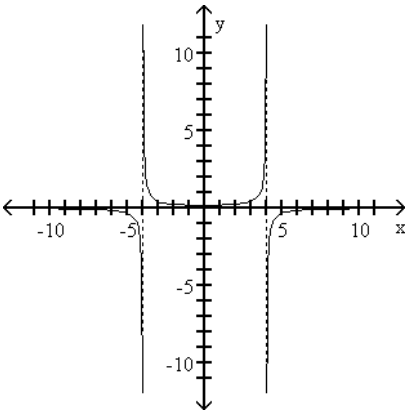

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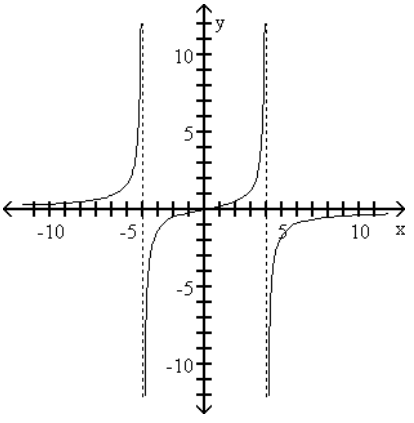
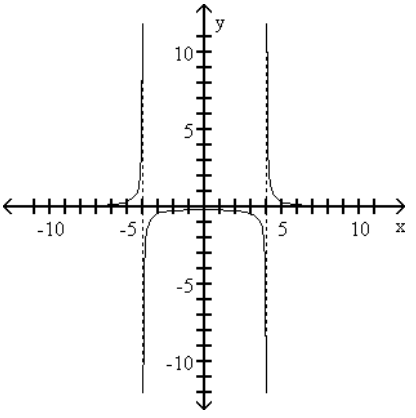


D)



Find the indicated intercept(s) of the graph of the function.

105) x-intercepts of $f(x) = \dfrac{x^2 + 8x}{x^2 + 5x - 2}$

A) (0, 0) and (8, 0) B) (0, 0) and (-8, 0) C) (8, 0) D) (-8, 0)

106) y-intercept of $f(x) = \dfrac{x^2 - 11x}{x^2 + 7x - 6}$

A) $\left(0, \dfrac{11}{6}\right)$ B) $\left(0, -\dfrac{6}{11}\right)$ C) (0, 11) D) (0, 0)

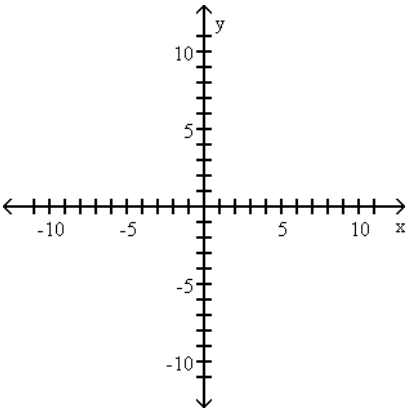
Find the slant asymptote, if any, of the graph of the rational function.

107) $f(x) = \dfrac{x^2 + 7x - 7}{x - 2}$

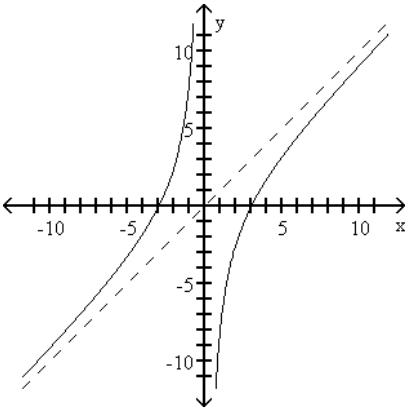
A) y = x + 7 B) y = x + 9 C) y = x D) no slant asymptote

Graph the function.

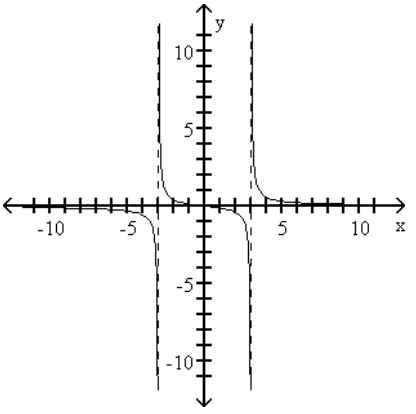
108) $f(x) = \dfrac{x^2 - 9}{x}$



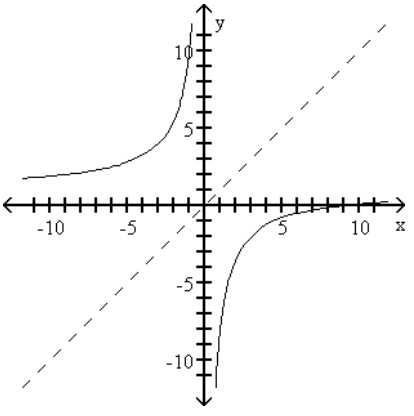
A)



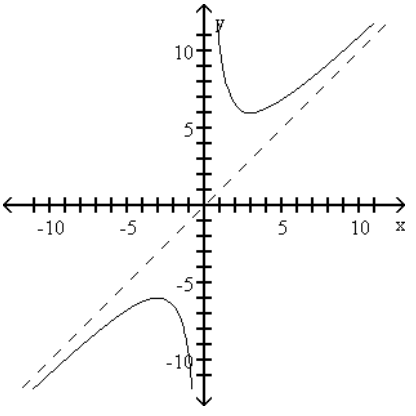
B)



C)

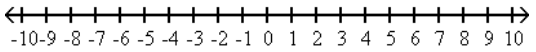


D)

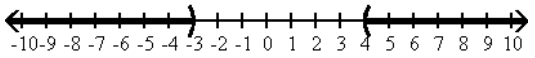


Solve the polynomial inequality and graph the solution set on a number line. Express the solution set in interval notation.

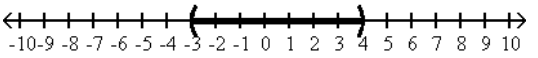
109) $(x - 4)(x + 3) > 0$



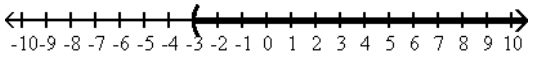
A) $(-\infty, -3) \cup (4, \infty)$



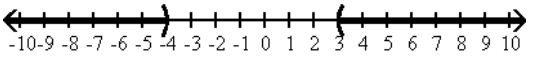
B) $(-3, 4)$



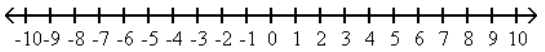
C) $(-3, \infty)$



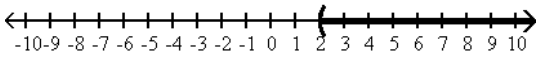
D) $(-\infty, -4) \cup (3, \infty)$



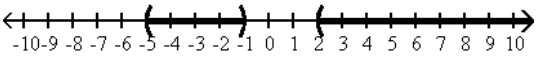
110) $(x + 5)(x + 1)(x - 2) > 0$



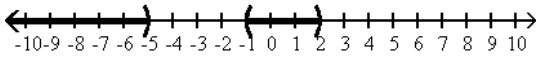
A) $(2, \infty)$



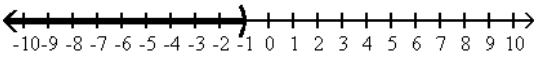
B) $(-5, -1) \cup (2, \infty)$



C) $(-\infty, -5) \cup (-1, 2)$

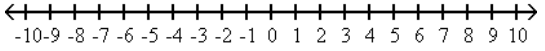


D) $(-\infty, -1)$

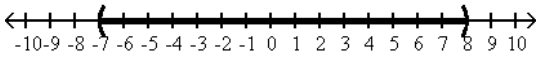


Solve the rational inequality and graph the solution set on a real number line. Express the solution set in interval notation.

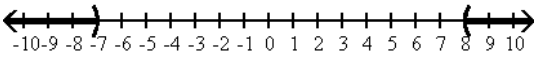
111) $\frac{x - 8}{x + 7} > 0$



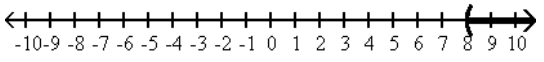
A) $(-7, 8)$



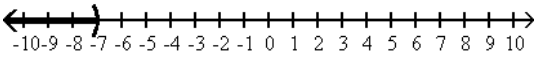
B) $(-\infty, -7)$ or $(8, \infty)$



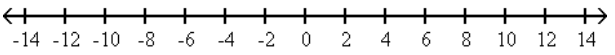
C) $(8, \infty)$



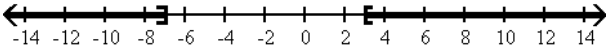
D) $(-\infty, -7)$



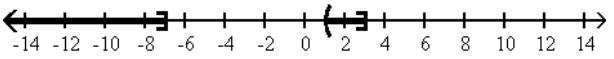
112) $\frac{(x + 7)(x - 3)}{x - 1} \geq 0$



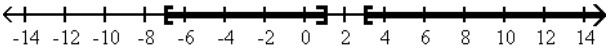
A) $(-\infty, -7] \cup [3, \infty)$



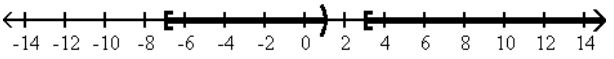
B) $(-\infty, -7] \cup (1, 3]$



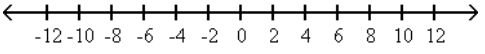
C) $[-7, 1] \cup [3, \infty)$



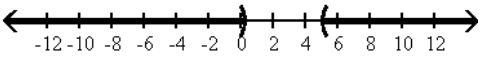
D) $[-7, 1) \cup [3, \infty)$



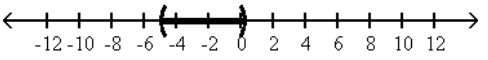
113) $\frac{x + 26}{x + 5} < 5$



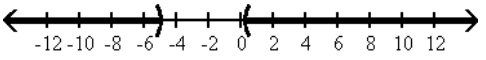
A) $(-\infty, \frac{1}{4})$ or $(5, \infty)$



B) $(-5, \frac{1}{4})$



C) $(-\infty, -5)$ or $(\frac{1}{4}, \infty)$



D) $\varnothing$