Name_____ MAT 110 College Algebra
Practice Test 1 R. Jenkins

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

Find the distance between P and Q.

1) P(6, 4), Q(-3, -4) 1) _____

A) 72 B) $\sqrt{17}$ C) $\sqrt{145}$ D) 1

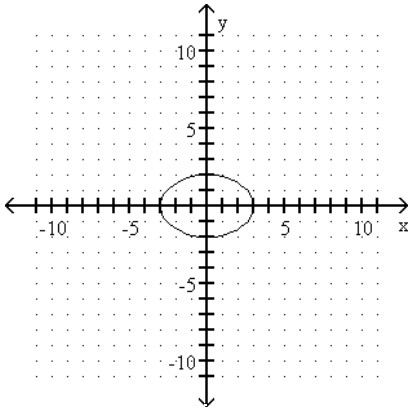
Find the coordinates of the midpoint of the line segment PQ.

2) P(4, 3), Q(-6, 7) 2) _____

A) $(5, -1)$ B) (10, -4) C) (-2, 10) D) $(-1, 5)$

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

3) 3) _____



A) x-intercepts: (0, 3), (0, -3)
B) x-intercepts: (3, 0), (-3, 0); y-intercepts: (0, 2), (0, -2)
C) y-intercepts: (0, 2),(0, -2)
D) x-intercepts: (0, 2), (0, -2); y-intercepts:(3, 0), (-3, 0)

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

4) $y = x^2 + 10x + 16$ 4) _____

A) x-intercepts: (8, 0), (2, 0); y-intercept: (0, 16)
B) x-intercepts: (-8, 0), (-2, 0); y-intercept: (0, 16)
C) x-intercept: (16, 0); y-intercepts: (0, 8), (0, 2)
D) x-intercept: (0, 16;) y-intercepts: (-8, 0), (-2, 0)

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

5) $y = -2x^3 + 3x$ 5) _____

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

6) $y = 6x^4 - 9x + 4$ 6) _____

A) origin only B) x-axis, origin C) no symmetry D) x-axis only

Specify the center and radius of the circle.

7) $(x + 7)^2 + (y + 6)^2 = 64$ 7) _____

A) center: (-7, -6); radius: 8
B) center: (-6, -7); radius: 64
C) center: (7, 6); radius: 8
D) center: (6, 7); radius: 64

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

8) Center (9, -8); passing through the point (12, -4) 8) _____

A) $(x - 8)^2 + (y + 9)^2 = 9$
B) $(x + 9)^2 + (y - 8)^2 = 25$
C) $(x - 9)^2 + (y + 8)^2 = 25$
D) $(x + 8)^2 + (y - 9)^2 = 9$

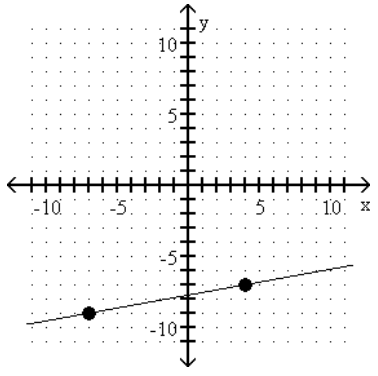
Find the slope of the line through the given pair of points.

9) (5, 8) and (-8, -3) 9) _____

A) $\frac{13}{11}$ B) $-\frac{11}{13}$ C) $-\frac{5}{3}$ D) $\frac{11}{13}$

Find the slope of the line.

10) 10) _____



A) $\frac{2}{11}$ B) $-\frac{11}{2}$ C) $-\frac{2}{11}$ D) $\frac{11}{2}$

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

11) Passing through (6, 6) and (-8, 6) 11) _____

A) y = 8x - 50 B) y = 6 C) y = 4x - 26 D) y = 2x - 14

12) Passing through (3, -3) and (10, -7) 12) _____

A) $y = -\frac{4}{7}x - \frac{9}{7}$
B) $y = \frac{6}{17}x - \frac{179}{17}$
C) $y = \frac{4}{7}x - \frac{9}{7}$
D) $y = -\frac{6}{17}x - \frac{179}{17}$

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

13) Perpendicular to -8x - 5y = -67; passing through (4, 7) 13) _____

A) $y = \frac{5}{8}x$ B) $y = \frac{8}{5}x + 36$ C) $y = -\frac{5}{8}x - \frac{9}{2}$ D) $y = \frac{5}{8}x + \frac{9}{2}$

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

14) $12x + 4y = 16$
$6x + 2y = 11$ 14) _____

A) Parallel B) Perpendicular C) Neither

Solve the problem.

15) The cost for labor associated with fixing a washing machine is computed as follows: There is a fixed charge of $25 for the repairman to come to the house, to which a charge of $18 per hour is added. Find an equation that can be used to determine the labor cost, C, of a repair that takes x hours. 15) _____

A) $C = 25 - 18x$ B) $C = 25 + 18x$ C) $C = (25 + 18)x$ D) $C = 18 + 25x$

16) The cost of manufacturing a molded part is related to the quantity produced during a production run. When 100 parts are produced, the cost is $300. When 500 parts are produced, the cost is $2300. What is the average cost per part? 16) _____

A) $5.00 per part B) $4.00 per part C) $0.20 per part D) $6.00 per part

17) Marty's Tee Shirt & Jacket Company is to produce a new line of jackets with a embroidery of a Great Pyrenees dog on the front. There are fixed costs of $540 to set up for production, and variable costs of $46 per jacket. Write an equation that can be used to determine the total cost, C, encountered by Marty's Company in producing x jackets, and use the equation to find the total cost of producing 136 jackets. 17) _____

A) $6808 B) $6788 C) $6776 D) $6796

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

18) $x = y^2 - 9$ 18) _____

A) Yes B) No

Find the function value.

19) Let $g(x) = \frac{x}{\sqrt{4 - x^2}}$. Find $g(-2)$. 19) _____

A) 3 B) 0 C) does not exist D) 1

20) Let $f(x) = x^2 + 5x + 4$. Find $f(-2)$. 20) _____

A) -10 B) -2 C) 18 D) 10

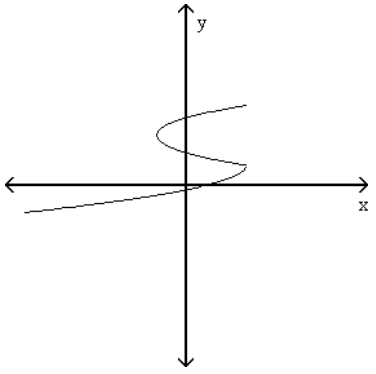
Find the domain of the function.

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

A) $(-\infty, 3) \cup (3, \infty)$ B) $(-\infty, -7) \cup (-7, 3) \cup (3, \infty)$
C) $(-\infty, -7) \cup (-7, \infty)$ D) $(-\infty, \infty)$

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

22) 22) _____

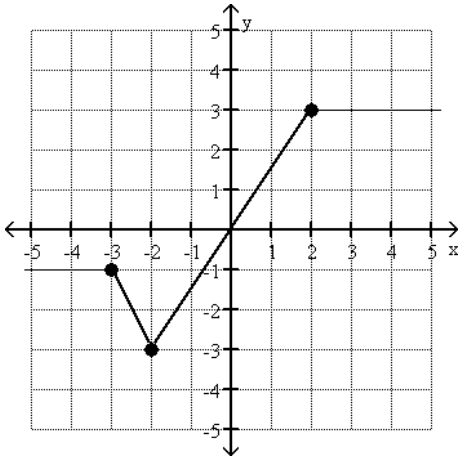


A) Yes B) No

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

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

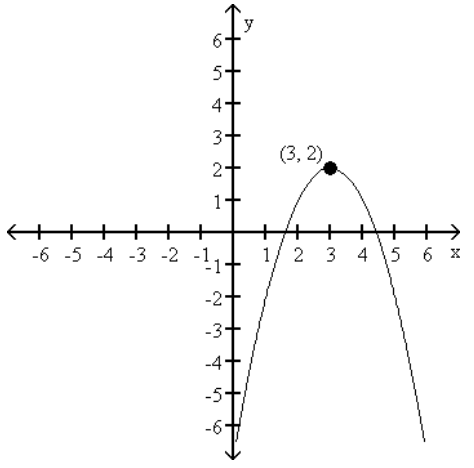
23) 23) _____



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

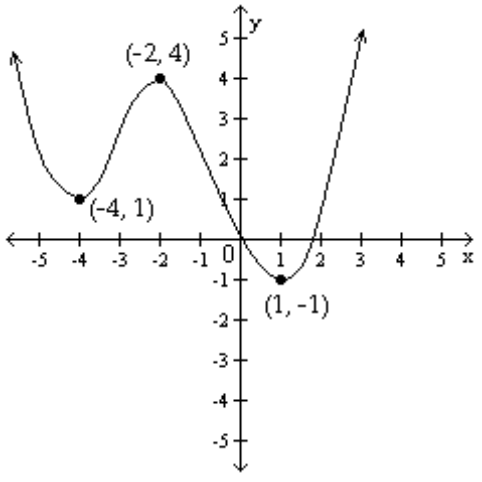
Locate relative maximum and relative minimum points on the graph. State whether each relative extremum point is a turning point.

24) 24) _____



A) (3, 0) is a relative maximum.
B) (3, 2) is a relative maximum and a turning point.
C) No relative extrema.
D) (3, 2) is a relative minimum and a turning point.

25) 25) _____



A) (-2, 4) is a relative maximum. (-4, 1) and (1, -1) are relative minima points.
B) (-2, 4) is a relative maximum point and a turning point. (1, -1) is a relative minimum point and a turning point.
C) (-2, 4) is a relative maximum and a turning point. (-4, 1) is a relative minimum point and a turning point.
D) (-2, 4) is a relative maximum point and a turning point. (-4, 1) and (1, -1) are relative minima points and turning points.

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

26) $f(x) = -9x^5 + 4x^3$ 26) _____

A) Even B) Odd C) Neither

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

27) $f(x) = x^2 - 3$; $a = -2$, $b = 5$ 27) _____

A) -7 B) 0 C) -3 D) 3

Write a linear function f that has the indicated values.

28) $f(-4) = 1$, $f(-7) = 9$ 28) _____

A) $f(x) = -\frac{5}{16}x + \frac{179}{16}$ B) $f(x) = \frac{5}{16}x + \frac{179}{16}$

C) $f(x) = -\frac{8}{3}x - \frac{29}{3}$ D) $f(x) = \frac{8}{3}x - \frac{29}{3}$

Find the requested value.

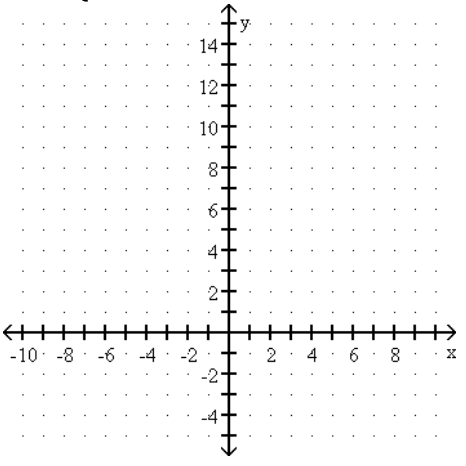
29) Find f(0) for 29) _____

$$f(x) = \begin{cases} x - 3, & \text{if } x < 8 \\ 7 - x, & \text{if } x \geq 8 \end{cases}$$

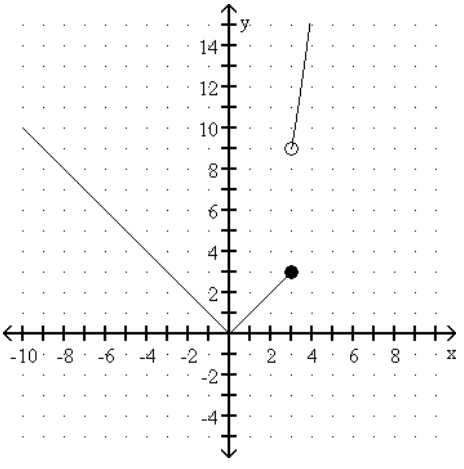
A) -1 B) 5 C) -3 D) 7

Graph the function.

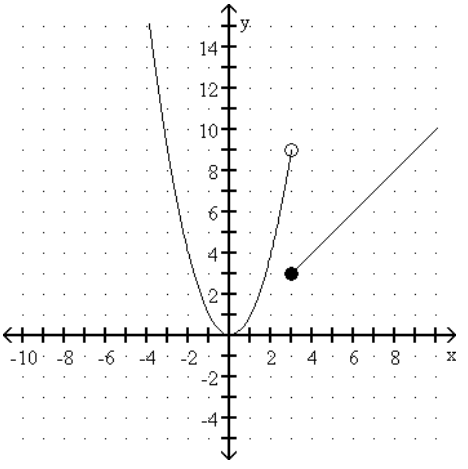
30) $f(x) = \begin{cases} |x| & \text{if } x \leq 3 \\ x^2 & \text{if } x > 3 \end{cases}$ 30) _____



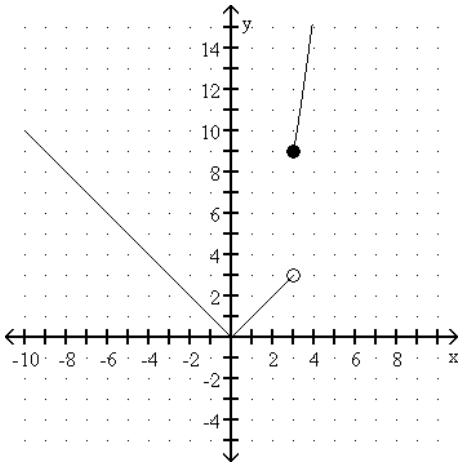
A)



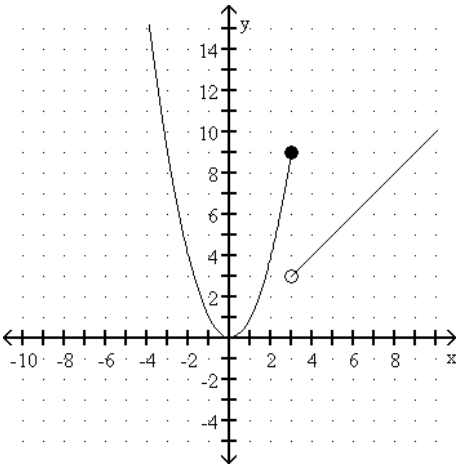
B)



C)



D)



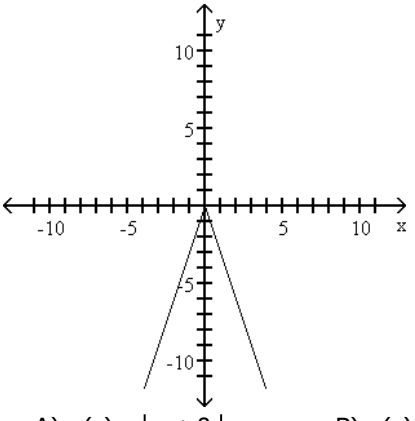
Describe the transformations that produce the graph of g from the graph of f.

31) $f(x) = \sqrt{x}$; $g(x) = -\sqrt{x + 10}$ 31) _____

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

Match the graph with its corresponding function.

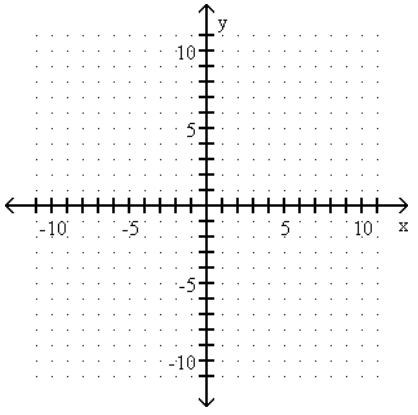
32) 32) _____



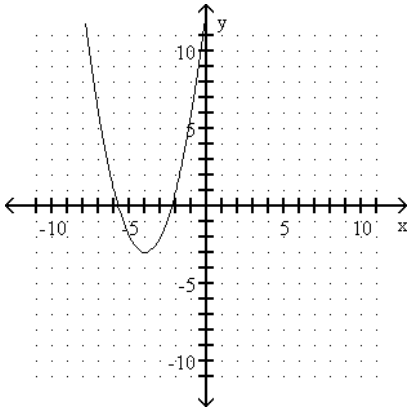
A) $g(x) = |x + 3|$ B) $g(x) = -3|x|$ C) $g(x) = |x| - 3$ D) $g(x) = |x - 3|$

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

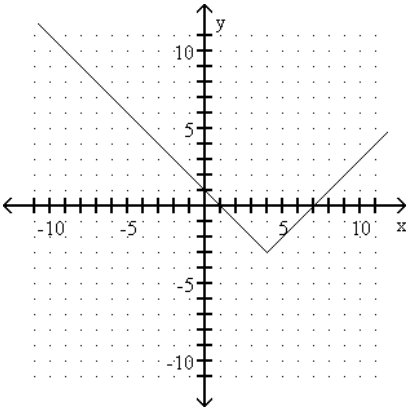
33) $g(x) = (x - 4)^2 - 3$ 33) _____



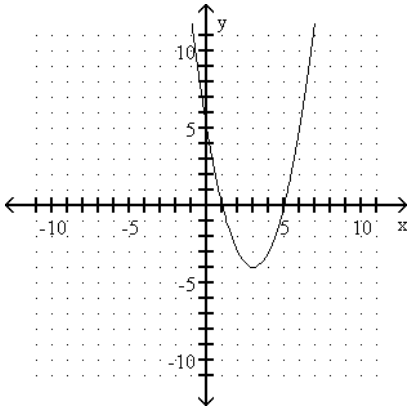
A)



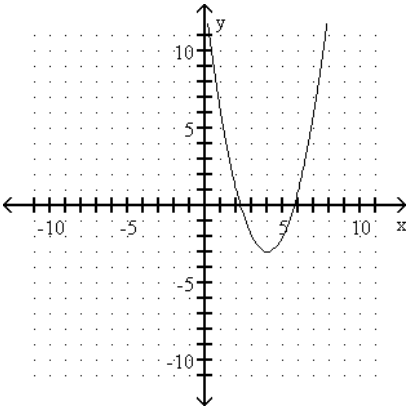
B)



C)



D)



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

34) The graph of $f(x) = x^2$ is shifted 3 units to the left and 5 units downward. 34) _____

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

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

35) $f(x) = 5x - 8$; $g(x) = 9x - 6$ 35) _____

Find f - g.

A) $(f - g)(x) = -4x - 2; (-\infty, \infty)$

B) $(f - g)(x) = 4x + 2; (-\infty, \infty)$

C) $(f - g)(x) = 14x - 14; (-\infty, 1) \cup (1, \infty)$

D) $(f - g)(x) = -4x - 14; \left(-\infty, -\frac{7}{2}\right) \cup \left(-\frac{7}{2}, \infty\right)$

Find the composite function for the given functions.

36) $f \circ g$ for $f(x) = 2x + 2$ and $g(x) = x^2 - 5$ 36) _____

A) $2x^2 - 8$ B) $x^2 + 2x - 3$ C) $x^2 - 2x - 7$ D) $4x^2 + 4x - 2$

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

37) $f(x) = \frac{1}{x - 5}$, $g(x) = \sqrt{x + 1}$ 37) _____

A) $[0, 24) \cup (24, \infty)$

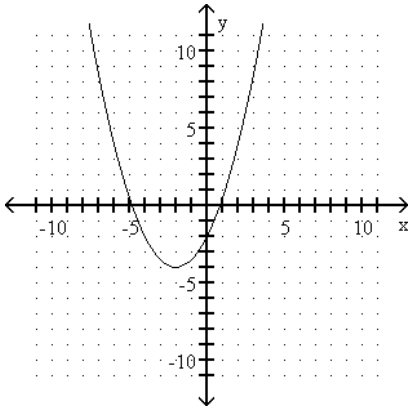
B) $[-1, 5) \cup (5, \infty)$

C) $[0, 5) \cup (5, \infty)$

D) $[-1, 24) \cup (24, \infty)$

Using the horizontal-line test, determine whether the function is one-to-one.

38) 38) _____



A) one-to-one

B) not one-to-one

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

Show that f and g are inverses of each other by verifying that $f(g(x)) = x = g(f(x))$.

39) $f(x) = \sqrt{5 - x}$; $g(x) = 5 - x^2$ 39) _____

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

Solve the problem.

40) 32° Fahrenheit = 0° Celsius. A function that converts temperatures in Fahrenheit to those in Celsius is $f(x) = \frac{5}{9}(x - 32)$. Find the inverse of the function. 40) _____

A) $f^{-1}(x) = \frac{9}{5}x - 32$

B) $f^{-1}(x) = \frac{5}{9}(x - 32)$

C) $f^{-1}(x) = x + 32$

D) $f^{-1}(x) = \frac{9}{5}x + 32$