

Name \_\_\_\_\_

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

Give the domain and range of the relation.

- 1)  $\{(1, -8), (-7, 8), (-3, 7), (-3, -5)\}$  1) \_\_\_\_\_  
A) domain =  $\{7, 8, -8, -5\}$ ; range =  $\{-3, -7, 1\}$   
B) domain =  $\{-3, -7, 1, 3\}$ ; range =  $\{7, 8, -8, -5\}$   
C) domain =  $\{-3, -7, 1\}$ ; range =  $\{7, 8, -8, -5\}$   
D) domain =  $\{-3, -7, 1, -13\}$ ; range =  $\{7, 8, -8, -5\}$

Determine whether the relation is a function.

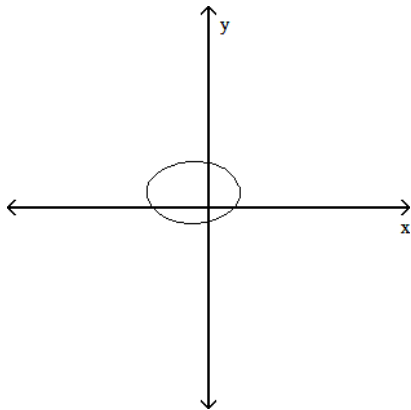
- 2)  $\{(1, -5), (3, 9), (4, 5), (7, 8), (12, -8)\}$  2) \_\_\_\_\_  
A) Function B) Not a function

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

- 3)  $h(x) = |x - 12|$ ;  $h(17)$  3) \_\_\_\_\_  
A) -5 B) 5 C) 29 D) -29

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

- 4) 4) \_\_\_\_\_



- A) function B) not a function

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

- 5) 5) \_\_\_\_\_

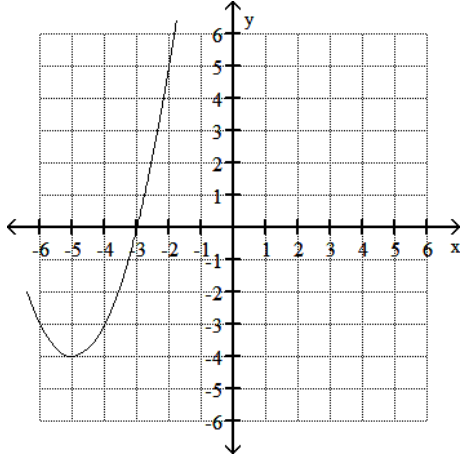
$$f(x) = \begin{cases} -5x + 4 & \text{if } x < -3 \\ 2x + 3 & \text{if } x \geq -3 \end{cases}$$

Determine  $f(-7)$ .

- A) 35 B) 42 C) 39 D) -10

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

6)



6) \_\_\_\_\_

A) domain:  $(-\infty, \infty)$

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

C) domain:  $(-\infty, -5)$  or  $(-5, \infty)$

range:  $(-\infty, -4)$  or  $(-4, \infty)$

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

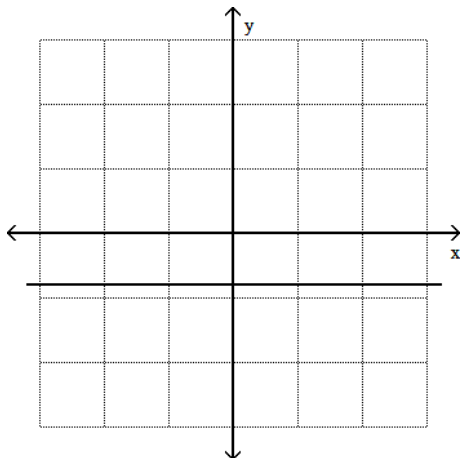
range:  $[-4, \infty)$

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

range:  $[-4, \infty)$

Use the shape of the graph to name the function.

7)



7) \_\_\_\_\_

A) Standard cubic function

C) Constant function

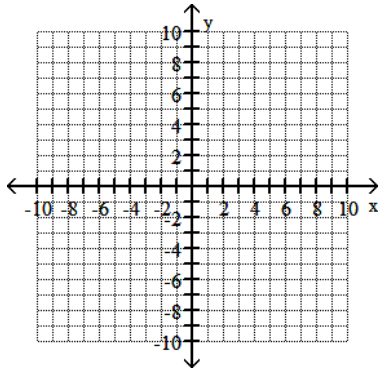
B) Absolute value function

D) Identity function

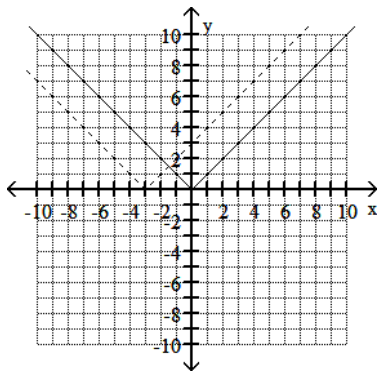
Begin by graphing the standard absolute value function  $f(x) = |x|$ . Then use transformations of this graph to graph the given function.

8)  $g(x) = |x| + 3$

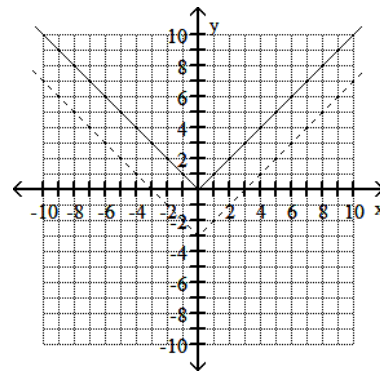
8) \_\_\_\_\_



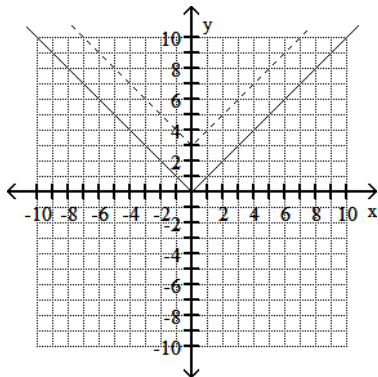
A)



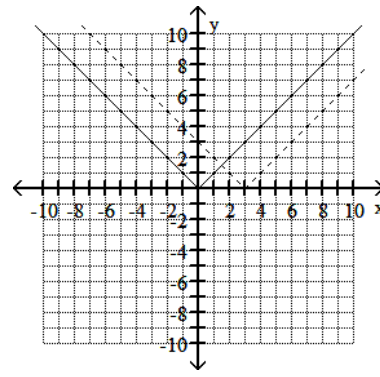
B)



C)



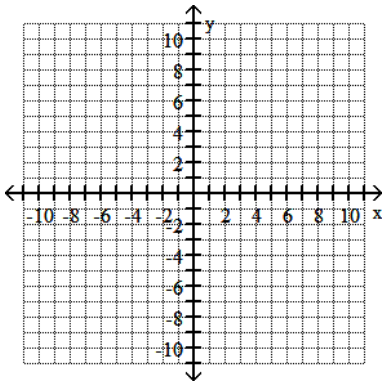
D)



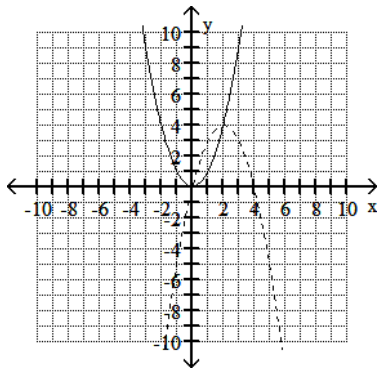
Begin by graphing the standard quadratic function  $f(x) = x^2$ . Then use transformations of this graph to graph the given function.

9)  $h(x) = -(x + 2)^2 + 4$

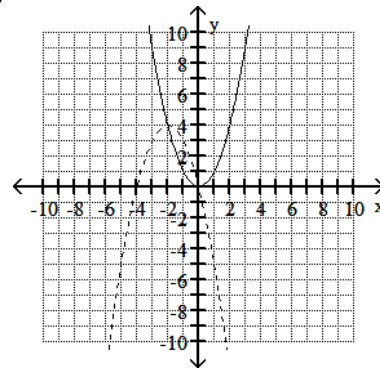
9) \_\_\_\_\_



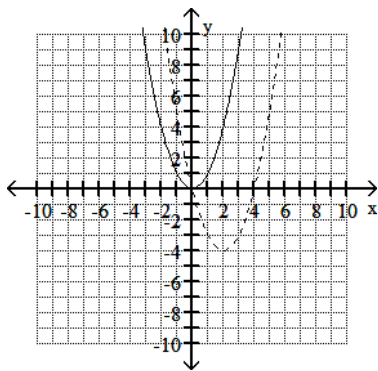
A)



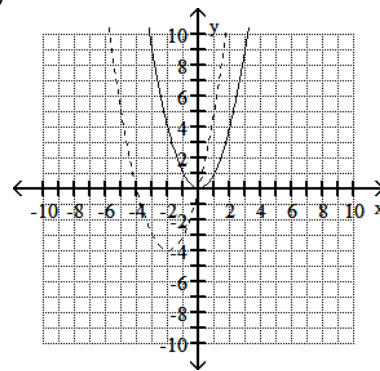
B)



C)



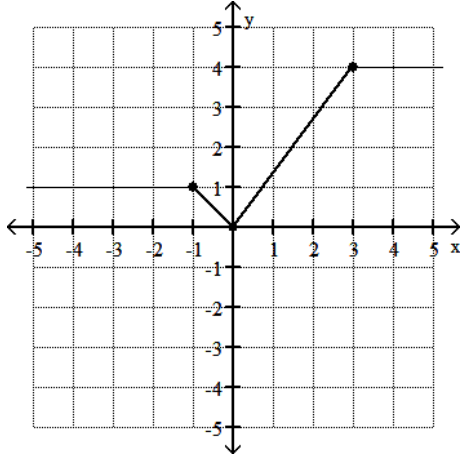
D)



Identify the intervals where the function is changing as requested.

10) Constant

10) \_\_\_\_\_



- A)  $(3, \infty)$
- C)  $(-1, 0)$

- B)  $(-\infty, 0)$
- D)  $(-\infty, -1)$  or  $(3, \infty)$

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

11)  $f(x) = 2x^2 + x^4$

A) Neither

B) Even

C) Odd

11) \_\_\_\_\_

Given functions  $f$  and  $g$ , perform the indicated operations.

12)  $f(x) = 6 - 8x$ ,  $g(x) = -4x + 8$

Find  $f + g$ .

A)  $-4x + 6$

B)  $2x$

C)  $-4x + 14$

D)  $-12x + 14$

12) \_\_\_\_\_

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

13)  $f(x) = 7x + 9$ ,  $g(x) = 2x - 1$

$(f \circ g)(x)$

A)  $14x + 2$

B)  $14x + 17$

C)  $14x + 8$

D)  $14x + 16$

13) \_\_\_\_\_

Given functions  $f$  and  $g$ , perform the indicated operations.

14)  $f(x) = 4x - 9$ ,  $g(x) = 7x - 3$

Find  $f - g$ .

A)  $-3x - 12$

B)  $3x + 6$

C)  $11x - 12$

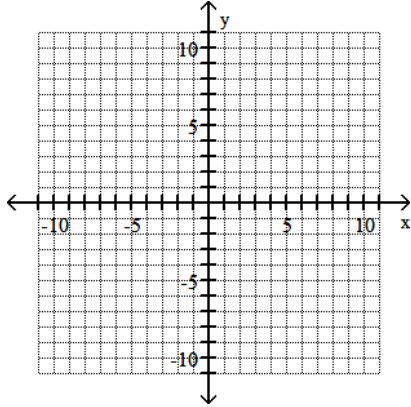
D)  $-3x - 6$

14) \_\_\_\_\_

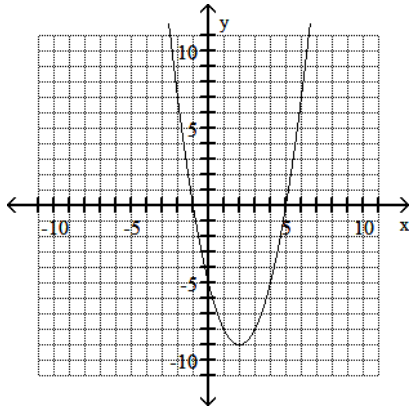
Use the vertex and intercepts to sketch the graph of the quadratic function.

15)  $f(x) = -x^2 - 4x + 5$

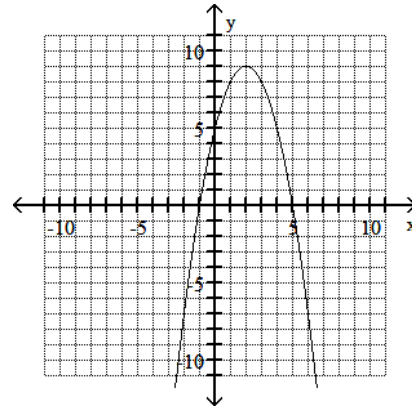
15) \_\_\_\_\_



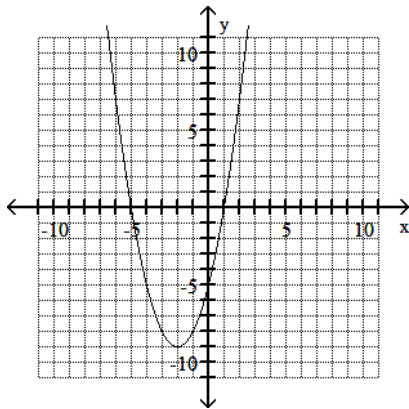
A)



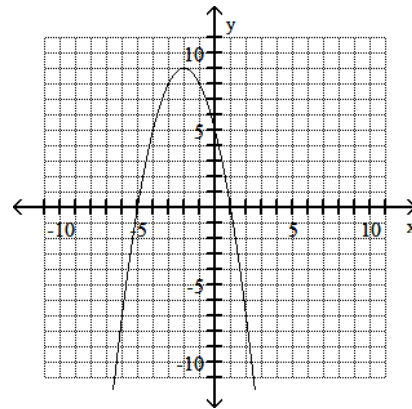
B)



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.

16)  $f(x) = 2x^2 - 4x$

16) \_\_\_\_\_

- A) minimum;  $(1, -2)$
- C) minimum;  $(-1, -2)$

- B) maximum;  $(-1, -2)$
- D) maximum;  $(1, -2)$

Find the x-intercepts of the polynomial function. State whether the graph crosses the x-axis, or touches the x-axis and turns around, at each intercept.

17)  $f(x) = -x^2(x + 5)(x^2 - 1)$

17) \_\_\_\_\_

- |  |   |
|--|---|
| <p>A) 0, touches the x-axis and turns around;<br/>-5, crosses the x-axis;<br/>-1, crosses the x-axis;<br/>1, crosses the x-axis</p> <p>C) 0, touches the x-axis and turns around;<br/>5, crosses the x-axis;<br/>-1, touches the x-axis and turns around;<br/>1, touches the x-axis and turns around</p> | <p>B) 0, crosses the x-axis;<br/>-5, crosses the x-axis;<br/>-1, crosses the x-axis;<br/>1, crosses the x-axis</p> <p>D) 0, touches the x-axis and turns around;<br/>-5, crosses the x-axis;<br/>1, touches the x-axis and turns around</p> |
|--|---|

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.

18)  $f(x) = 3(x - 3)(x - 6)^3$

18) \_\_\_\_\_

- A) -3, multiplicity 1, touches x-axis; -6, multiplicity 3, touches x-axis and turns around  
 B) -3, multiplicity 1, crosses x-axis; -6, multiplicity 3, crosses x-axis  
 C) 3, multiplicity 1, crosses x-axis; 6, multiplicity 3, touches x-axis and turns around  
 D) 3, multiplicity 1, crosses x-axis; 6, multiplicity 3, crosses x-axis

Determine the maximum possible number of turning points for the graph of the function.

19)  $f(x) = (x + 3)(x + 4)(4x - 3)$

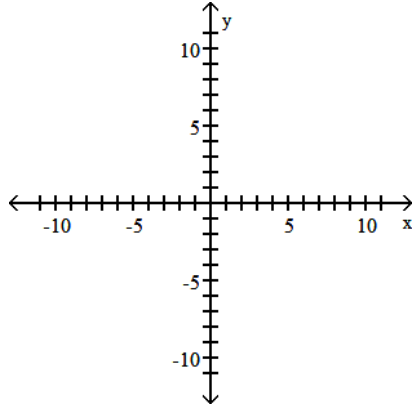
19) \_\_\_\_\_

- A) 3                                      B) 4                                      C) 2                                      D) 0

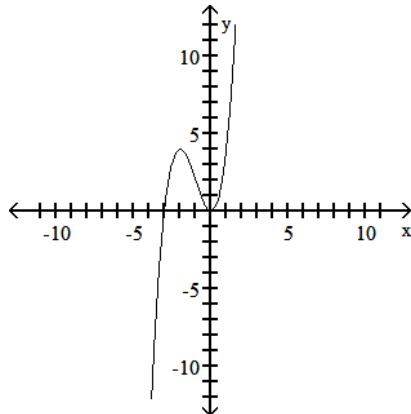
Graph the polynomial function.

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

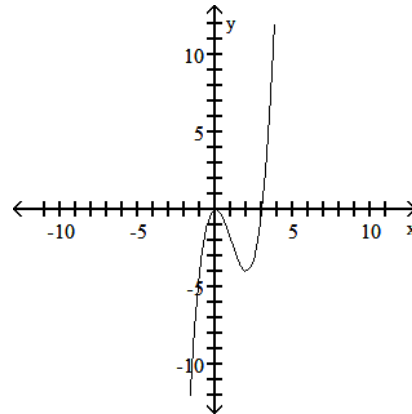
20) \_\_\_\_\_



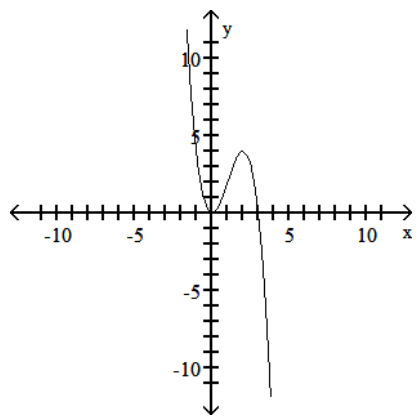
A)



B)



C)



D)

