

Name \_\_\_\_\_

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

- 1)  $\{(-3, 7), (0, 4), (4, -3), (7, -2)\}$  1) \_\_\_\_\_  
 A) function B) function  
 domain:  $\{-3, 0, 4, 7\}$  domain:  $\{7, 4, -3, -2\}$   
 range:  $\{7, 4, -3, -2\}$  range:  $\{-3, 0, 4, 7\}$   
C) not a function

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

- 2)  $y^2 = 7 - x^2$  2) \_\_\_\_\_  
 A) function B) not a function  
 3)  $y = 3x^2 - 4x + 8$  3) \_\_\_\_\_  
 A) function B) not a function

**Find the value for the function.**

- 4) Find  $f(-1)$  when  $f(x) = \frac{x^2 - 4}{x - 3}$ . 4) \_\_\_\_\_  
 A)  $-\frac{5}{2}$  B)  $-\frac{5}{4}$   
 C)  $-\frac{1}{4}$  D)  $\frac{3}{4}$   
 5) Find  $f(2x)$  when  $f(x) = 3x^2 + 5x - 4$ . 5) \_\_\_\_\_  
 A)  $12x^2 + 10x - 8$  B)  $12x^2 + 10x - 4$   
 C)  $6x^2 + 10x - 8$  D)  $6x^2 + 10x - 4$

**Solve the problem.**

- 6) It has been determined that the number of fish  $f(t)$  that can be caught in  $t$  minutes in a certain pond using a certain bait is  $f(t) = 0.26t + 1$ , for  $t > 10$ . Find the approximate number of fish that can be caught if you fish for 33 minutes. 6) \_\_\_\_\_  
 A) About 9 fish B) About 37 fish  
 C) About 35 fish D) About 20 fish

**Find the domain of the function.**

- 7)  $g(x) = \frac{3x}{x^2 - 49}$  7) \_\_\_\_\_  
 A)  $\{x \mid x \neq 0\}$  B) all real numbers  
 C)  $\{x \mid x \neq -7, 7\}$  D)  $\{x \mid x > 49\}$

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

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

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

Find  $f + g$ .

A)  $(f + g)(x) = -x^2 + x + 12$ ; all real numbers

B)  $(f + g)(x) = 4 + x$ ;  $\{x \mid x \neq -4\}$

C)  $(f + g)(x) = x^3 - 4x^2 - 16x + 64$ ; all real numbers

D)  $(f + g)(x) = -x^2 - x + 20$ ; all real numbers

9)  $f(x) = \frac{6x+7}{2x-5}$ ;  $g(x) = \frac{4x}{2x-5}$

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

Find  $f - g$ .

A)  $(f - g)(x) = \frac{2x+7}{2x-5}$ ;  $\{x \mid x \neq \frac{5}{2}, x \neq -\frac{7}{2}\}$

B)  $(f - g)(x) = \frac{10x-7}{2x-5}$ ;  $\{x \mid x \neq \frac{5}{2}\}$

C)  $(f - g)(x) = \frac{2x+7}{2x-5}$ ;  $\{x \mid x \neq \frac{5}{2}\}$

D)  $(f - g)(x) = \frac{2x+7}{2x-5}$ ;  $\{x \mid x \neq 0\}$

Solve the problem.

10) Find  $(fg)(3)$  when  $f(x) = x + 7$  and  $g(x) = -4x^2 + 14x - 5$ .

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

A) 460

B) 10

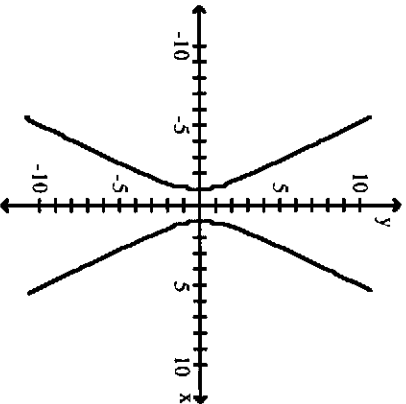
C) -4

D) 164

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.

11)

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



A) function

domain:  $\{x \mid -1 \leq x \leq 1\}$

range: all real numbers

intercepts:  $(-1, 0), (1, 0)$

symmetry:  $x$ -axis,  $y$ -axis

C) function

domain:  $\{x \mid x \leq -1$  or  $x \geq 1\}$

range: all real numbers

intercepts:  $(-1, 0), (1, 0)$

symmetry:  $x$ -axis,  $y$ -axis, origin

B) function

domain: all real numbers

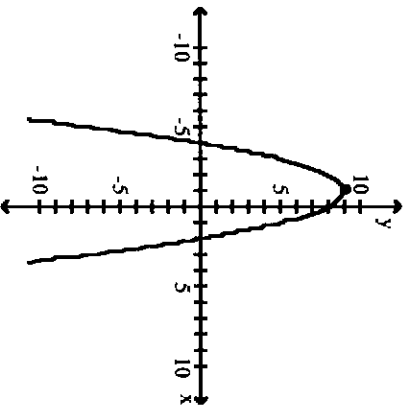
range:  $\{y \mid y \leq -1$  or  $y \geq 1\}$

intercepts:  $(-1, 0), (1, 0)$

symmetry:  $y$ -axis

D) not a function

12)



A) function

domain:  $\{x \mid x \leq 9\}$

range: all real numbers

intercepts:  $(-4, 0), (0, 8), (2, 0)$

symmetry: y-axis

C) function

domain: all real numbers

range:  $\{y \mid y \leq 9\}$

intercepts:  $(0, -4), (8, 0), (0, 2)$

symmetry: none

B) function

domain: all real numbers

range:  $\{y \mid y \leq 9\}$

intercepts:  $(-4, 0), (0, 8), (2, 0)$

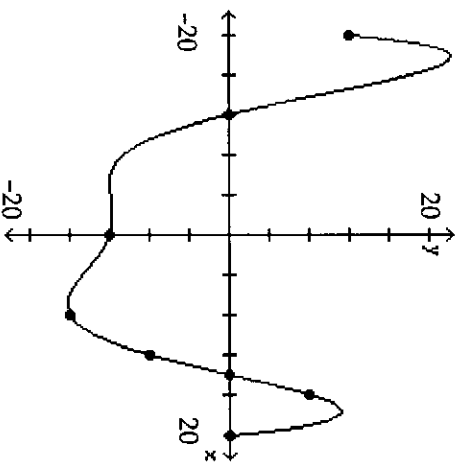
symmetry: none

D) not a function

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

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

13) For what numbers  $x$  is  $f(x) < 0$ ?



A)  $[-20, -12), (14, 20)$

C)  $(-12, \infty)$

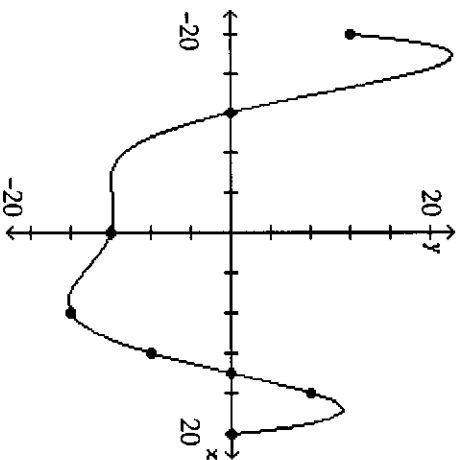
B)  $(-12, 14)$

D)  $(-\infty, -12)$

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

14) How often does the line  $y = 4$  intersect the graph?

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



- A) once
- C) three times

- B) twice
- D) does not intersect

Answer the question about the given function.

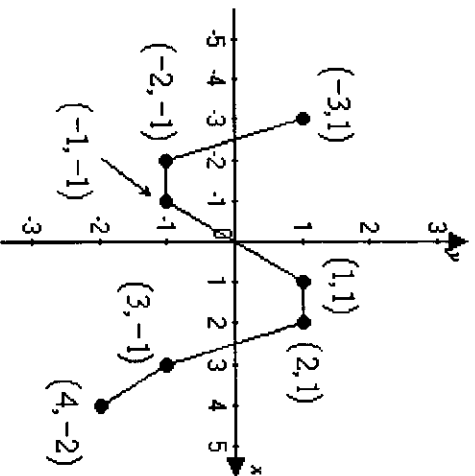
- 15) Given the function  $f(x) = 5x^2 + 10x - 6$ , is the point  $(-1, -11)$  on the graph of  $f$ ?
- A) Yes
  - B) No

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

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

16)

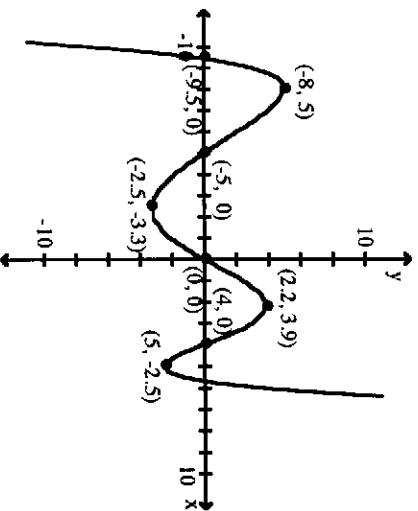
16) \_\_\_\_\_



- A) Decreasing on  $(-3, -2)$  and  $(2, 4)$ ; increasing on  $(-1, 1)$
- B) Decreasing on  $(-3, -2)$  and  $(2, 4)$ ; increasing on  $(-1, 1)$ ; constant on  $(-2, -1)$  and  $(1, 2)$
- C) Increasing on  $(-3, -2)$  and  $(2, 4)$ ; decreasing on  $(-1, 1)$ ; constant on  $(-2, -1)$  and  $(1, 2)$
- D) Decreasing on  $(-3, -1)$  and  $(1, 4)$ ; increasing on  $(-2, 1)$

The graph of a function  $f$  is given. Use the graph to answer the question.  
17)

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



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

- A)  $f$  has a local maximum at  $x = -3.3$  and  $-2.5$ ; the local maximum at  $-3.3$  is  $-2.5$ ; the local maximum at  $-2.5$  is  $5$
- B)  $f$  has a local maximum at  $x = -2.5$  and  $5$ ; the local maximum at  $-2.5$  is  $-3.3$ ; the local maximum at  $5$  is  $-2.5$
- C)  $f$  has a local minimum at  $x = -2.5$  and  $5$ ; the local minimum at  $-2.5$  is  $-3.3$ ; the local minimum at  $5$  is  $-2.5$
- D)  $f$  has a local minimum at  $x = -3.3$  and  $-2.5$ ; the local minimum at  $-3.3$  is  $-2.5$ ; the local minimum at  $-2.5$  is  $5$

Write an equation that results in the indicated translation.

18) The square root function, shifted 8 units downward

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

A)  $y = \sqrt{x - 8}$

B)  $y = \sqrt{x + 8}$

C)  $y = \sqrt{x - 8}$

D)  $y = \sqrt{x + 8}$

19) The absolute value function, shifted 6 units to the right

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

A)  $y = |x - 6|$

B)  $y = |x| - 6$

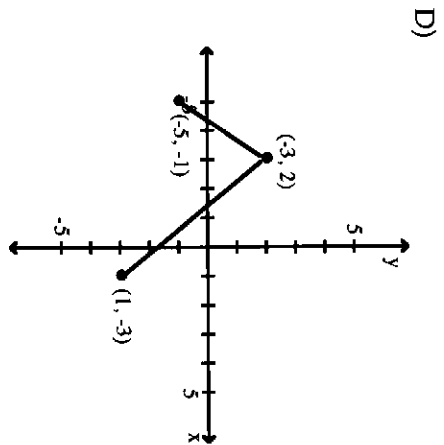
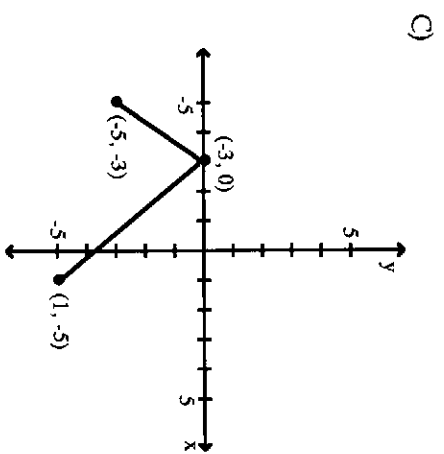
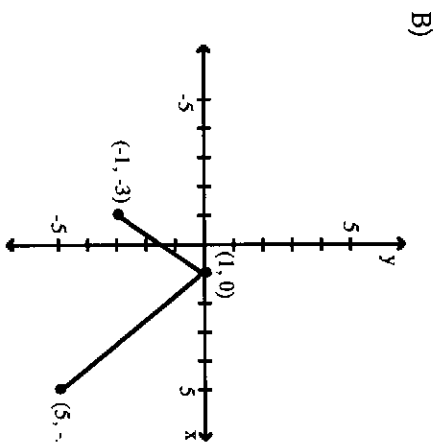
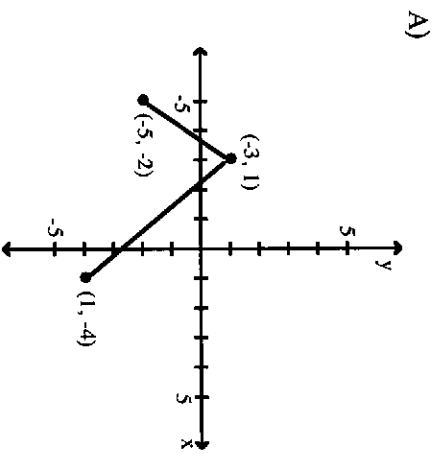
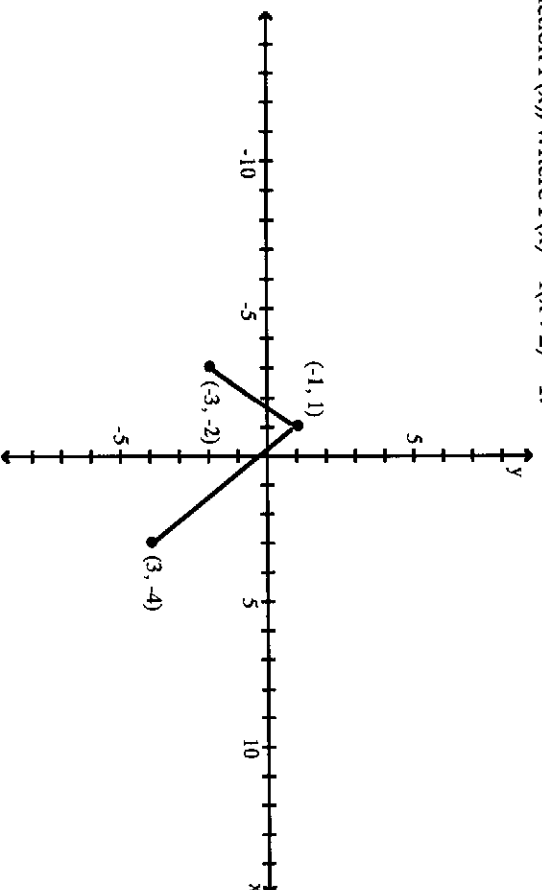
C)  $y = |x + 6|$

D)  $y = |x| + 6$

Using transformations, sketch the graph of the requested function.

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

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



Find the function.

21) Find the function that is finally graphed after the following transformations are applied to the graph of  $y = \sqrt{x}$ . The graph is shifted up 3 units, reflected about the  $y$ -axis, and finally shifted left 8 units.

21) \_\_\_\_\_

A)  $y = \sqrt{-x - 8} + 3$

B)  $y = \sqrt{-x + 8} + 3$

C)  $y = -\sqrt{x + 8} - 3$

D)  $y = \sqrt{-x - 8} - 3$

Solve the problem.

22) Suppose that the  $x$ -intercepts of the graph of  $y = f(x)$  are 8 and 6. What are the  $x$ -intercepts of  $y = f(-x)$ ?

22) \_\_\_\_\_

A) -8 and -6

B) -8 and 6

C) 8 and -6

D) 8 and 6