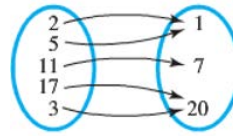


2.2 In-class Practice

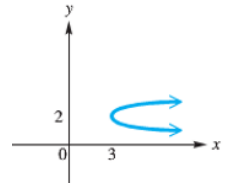
1. Decide whether each relation defines a function and give the domain and range.

a) $\{(1,1), (1, -1), (0,0), (2,4), (2, -4)\}$

b)



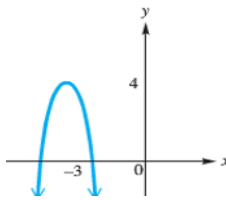
e)



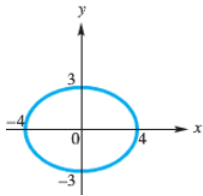
c)

x	y
0	0
-1	1
-2	2

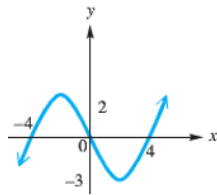
d)



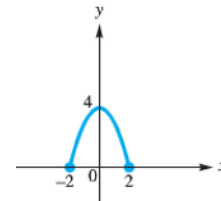
f)



g)



h)



i) $y = x^3$

j) $x = y^6$

k) $y = -\sqrt{x-2}$

l) $x + y < 3$

m) $xy = 2$

n) $y = \frac{2}{x-3}$

2. **Concept Check** Choose the correct answer: For function f , the notation $f(3)$ means

- A. the variable f times 3, or $3f$.
- B. the value of the dependent variable when the independent variable is 3.
- C. the value of the independent variable when the dependent variable is 3.
- D. f equals 3.

3. Let $f(x) = -3x + 4$ and $g(x) = -x^2 + 4x + 1$. Find and simplify each of the following:

a) $g(-x)$

b) $f(3t - 2)$

c) $\frac{f(x+h)-f(x)}{h}$

4. For each piecewise-defined function, find $f(-5), f(-1), f(0), f(3)$. Then graph it.

a) $f(x) = \begin{cases} -3 & \text{if } x \leq 1 \\ -1 & \text{if } x > 1 \end{cases}$

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

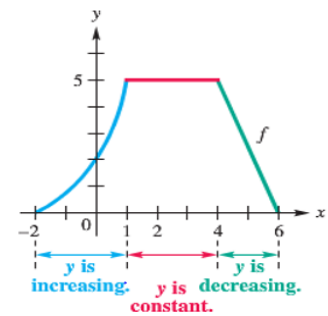
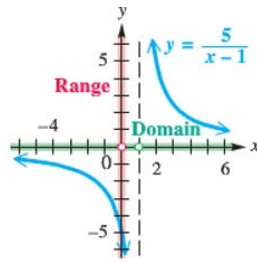
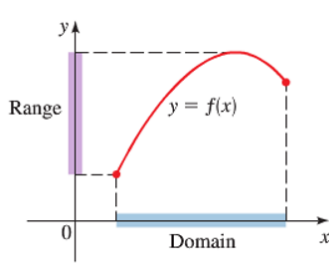
c) $f(x) = \begin{cases} -\frac{1}{2}x^2 + 2 & \text{if } x \leq 2 \\ \frac{1}{2}x & \text{if } x > 2 \end{cases}$

5. Graph each function.

a) $f(x) = \llbracket -x \rrbracket$

b) $f(x) = \llbracket 2x \rrbracket$

2.2 In-class Practice



6. Find the domain and range.

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

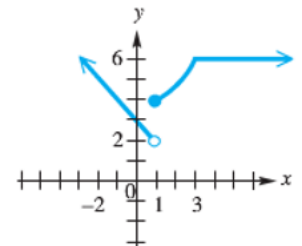
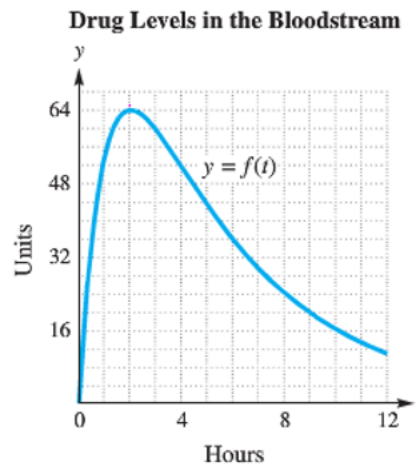
b) $f(x) = \sqrt{16 - x^2}$

c) $f(x) = \sqrt{5 - 3x}$

7. Determine intervals on which the function increases, decreases, or remains constant.

8. **Drug Levels in the Bloodstream** When a drug is taken orally, the amount of the drug in the bloodstream after t hours is given by the function defined by $y = f(t)$, as shown in the graph.

- (a) How many units of the drug are in the bloodstream at 8 hr?
- (b) During what time interval is the drug level in the bloodstream increasing? decreasing?
- (c) When does the level of the drug in the bloodstream reach its maximum value, and how many units are in the bloodstream at that time?
- (d) When the drug reaches its maximum level in the bloodstream, how many additional hours are required for the level to drop to 16 units?
- (e) Use the graph to give a word description of the 12-hr period.



9. **Speeding Tickets** In a certain state the maximum speed permitted on freeways is 65 mi/h, and the minimum is 40. The fine F for violating these limits is \$15 for every mile above the maximum or below the minimum.

(a) Complete the expressions in the following piecewise defined function, where x is the speed at which you are driving.

$$F(x) = \begin{cases} \text{ } & \text{if } 0 < x < 40 \\ \text{ } & \text{if } 40 \leq x \leq 65 \\ \text{ } & \text{if } x > 65 \end{cases}$$

- (b) Find $F(30)$, $F(50)$, and $F(75)$.
- (c) What do your answers in part (b) represent?