2-1

Practice

Form G

Relations and Functions

The table shows the number of gold medals won by United States athletes during the Summer Olympics.

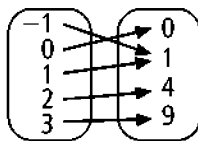| U.S. Gold Medals in Summer Olympics						
Year	1988	1992	1996	2000	2004	2008
Gold Medals	36	37	44	40	35	36

1. Represent the data using each of the following:
   a. a mapping diagram
   b. ordered pairs
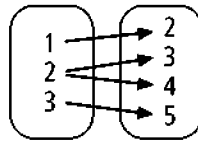   **c.** a graph on the coordinate plane

2. What is the domain and range of this data set?
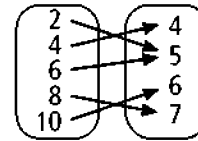
Determine whether each relation is a function.
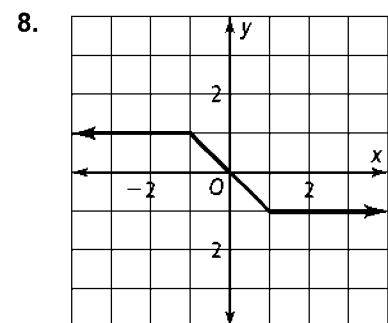
3. Domain   Range

```
−1 ──┐ ┌─► 0
 0 ──┼─┼─► 1
 1 ──┼─┼─► 4
 2 ──┼─┼─► 9
 3 ──┘ └─►
```

4. Domain   Range

```
 1 ──┐ ┌─► 2
   ──┼─┼─► 3
 2 ──┼─┼─► 4
 3 ──┘ └─► 5
```

5. Domain Range

```
 2 ──┐ ┌─► 4
 4 ──┼─┼─► 5
 6 ──┼─┼─► 6
 8 ──┼─┼─► 7
10 ──┘ └─►
```

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

6.

7.

8.

Name_____ Class _____ Date_____
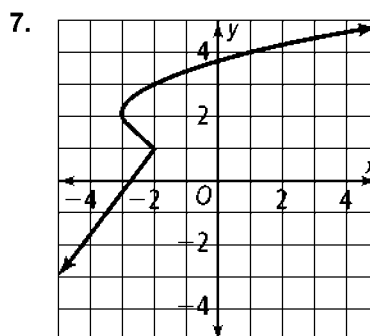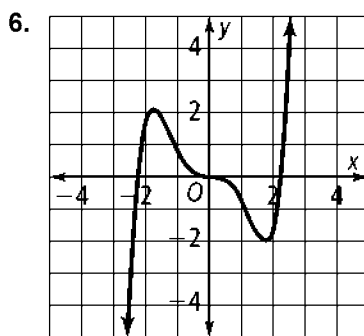
2-1

Practice (continued)   *Form G*

Relations and Functions

Evaluate each function for the given value of *x*, and write the input *x* and the output *f*(*x*) as an ordered pair.

9. $f(x) = -3x + 2$ for $x = 3$

10. $f(x) = \frac{1}{2}x - 1$ for $x = -2$

11. $f(x) = 5x - 22$ for $x = 12$

12. $f(x) = -5x - 3$ for $x = -7$

13. $f(x) = \frac{9}{4}x - 15$ for $x = 4$

14. $f(x) = \frac{5}{3}x - \frac{3}{5}$ for $x = 3$

Write a function rule to model the cost of renting a truck for one day. Then evaluate the function for the given number of miles.

15. Daily rental: $19.95
   Rate per mile: $.50 per mile
   Miles traveled: 73 miles

16. Daily rental: $39.95
   Rate per mile: $.60 per mile
   Miles traveled: 48 miles

Find the domain and range of each relation, and determine whether it is a function.

17.

18.
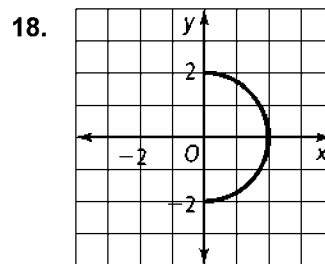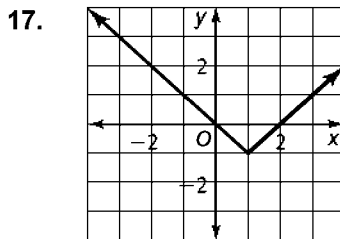
19. The surface area of a sphere is a function of the radius of the sphere: $A = 4\pi r^2$. Evaluate the function for a basketball with a radius of 11.5 cm.

20. The relation between the length of the femur *f*, the bone from the knee to the hip joint, and the height of an adult woman *h* is modeled by the function $h(f) = 2.3f + 24$. In the following ordered pairs, the first coordinate is the femur length and the second coordinate is the corresponding height, in inches. Find the unknown measure in each ordered pair.
   a. (13, *t*)   **b.** (14.5, *p*)   **c.** (*m*, 56.2)   **d.** (*n*, 72.3)