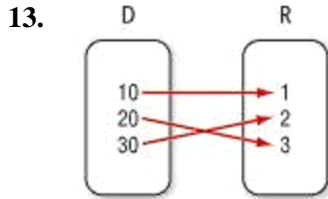
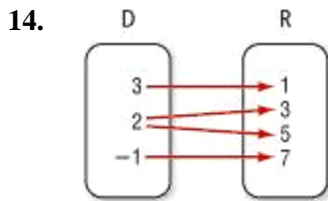


## 2-1 Relations and Functions - Exercises

State the domain and range of each relation. Then determine whether each relation is a function. Write *yes* or *no*.



$D = \{10, 20, 30\}$ ,  $R = \{1, 2, 3\}$ ; yes



$D = \{-1, 2, 3\}$ ,  $R = \{1, 3, 5, 7\}$ ; no

15.

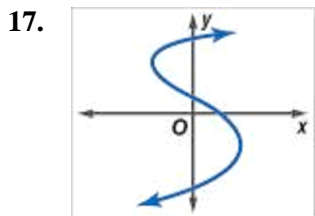
$x$	$y$
0.5	-3
2	0.8
0.5	8

$D = \{0.5, 2\}$ ,  $R = \{-3, 0.8, 8\}$ ; no

16.

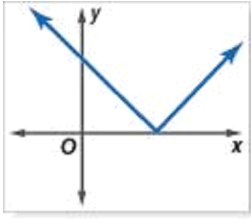
$x$	$y$
2000	\$4000
2001	\$4300
2002	\$4600
2003	\$4500

$D = \{2000, 2001, 2002, 2003\}$ ,  
 $R = \{4000, 4300, 4500, 4600\}$ ; yes



$D = \text{all reals}$ ,  $R = \text{all reals}$ ; no

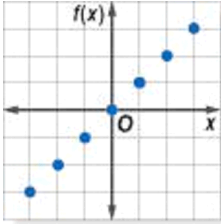
18.



D = all reals, R = all nonnegative reals; yes

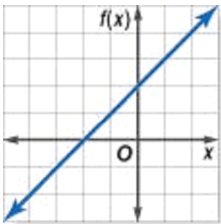
Determine whether each function is *discrete* or *continuous*.

19.



discrete

20.



continuous

21.  $\{(-3, 0), (-1, 1), (1, 3)\}$

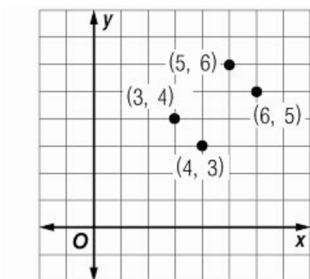
discrete

22.  $y = -x + 4$

continuous

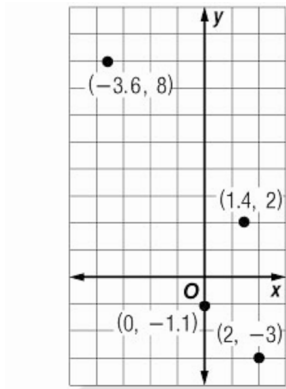
Graph each relation or equation and find the domain and range. Then determine whether the relation or equation is a function and state whether it is *discrete* or *continuous*.

26.  $\{(3, 4), (4, 3), (6, 5), (5, 6)\}$



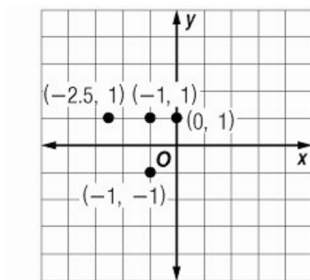
D =  $\{3, 4, 5, 6\}$ , R =  $\{3, 4, 5, 6\}$ ; yes; discrete

27.  $\{(0, -1.1), (2, -3), (1.4, 2), (-3.6, 8)\}$



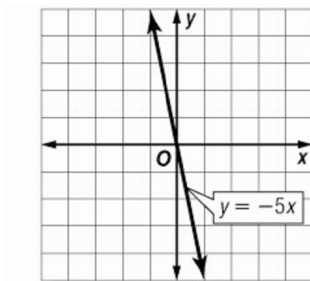
$D = \{-3.6, 0, 1.4, 2\}$ ,  $R = \{-3, -1.1, 2, 8\}$ ; yes; discrete

28.  $\{(-2.5, 1), (-1, -1), (0, 1), (-1, 1)\}$



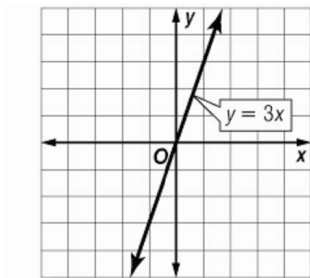
$D = \{-2.5, -1, 0\}$ ,  $R = \{-1, 1\}$ ; no; discrete

29.  $y = -5x$



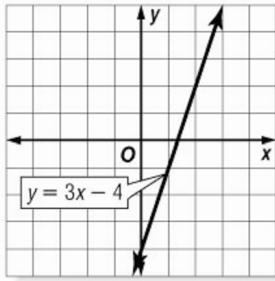
$D = \text{all reals}$ ,  $R = \text{all reals}$ ; yes; continuous

30.  $y = 3x$



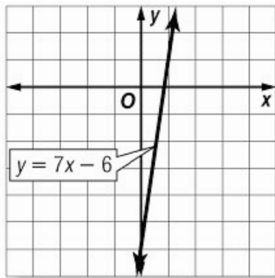
$D = \text{all reals}$ ,  $R = \text{all reals}$ ; yes; continuous

31.  $y = 3x - 4$



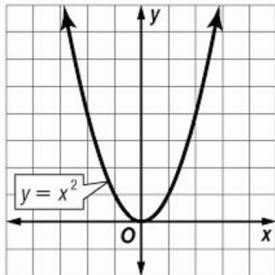
D = all reals, R = all reals; yes; continuous

32.  $y = 7x - 6$



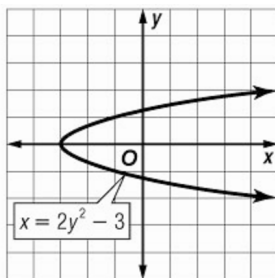
D = all reals, R = all reals; yes; continuous

33.  $y = x^2$



D = all reals, R =  $\{y \mid y \geq 0\}$ ; yes; continuous

34.  $x = 2y^2 - 3$



D =  $\{x \mid x \geq -3\}$ , R = all reals; no; continuous

Find each value if  $f(x) = 3x - 5$  and  $g(x) = x^2 - x$ .

35.  $f(-3)$

-14

36.  $g(3)$

6

37.  $g\left(\frac{1}{3}\right)$

$-\frac{2}{9}$

56. **FIND THE ERROR** Teisha and Molly are finding  $g(2a)$  for the function  $g(x) = x^2 + x - 1$ . Who is correct? Explain your reasoning.

**Teisha**

$$\begin{aligned} g(2a) &= 2(a^2 + a - 1) \\ &= 2a^2 + 2a - 2 \end{aligned}$$

**Molly**

$$\begin{aligned} g(2a) &= (2a)^2 + 2a - 1 \\ &= 4a^2 + 2a - 1 \end{aligned}$$

Molly; to find  $g(2a)$ , replace  $x$  with  $2a$ . Teisha found  $2g(a)$ , not  $g(2a)$ .

57. **CHALLENGE** If  $f(3a - 1) = 12a - 7$ , find one possible expression for  $f(x)$ .

Sample answer:  $f(x) = 4x - 3$

**Solve each inequality.**

62.  $|5 - m| < 1$

$\{m \mid 4 < m < 6\}$

**PREREQUISITE SKILL** Solve each equation. Check your solution.

70.  $\frac{1}{3}x - 4 = 1$

15