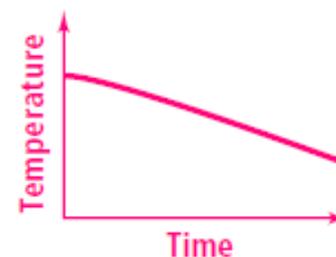


Sketch a graph to represent the situation. Label each section.

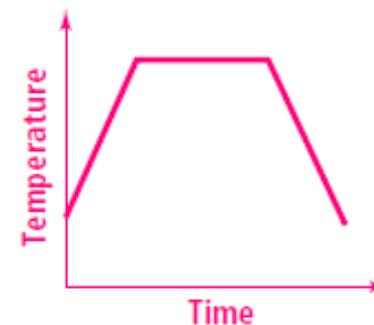
1. The temperature of the water decreases over the first few hours in the refrigerator.



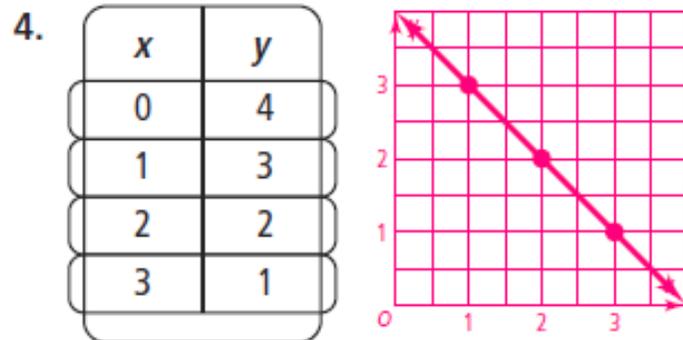
2. The sales of the company have increased steadily over the years.



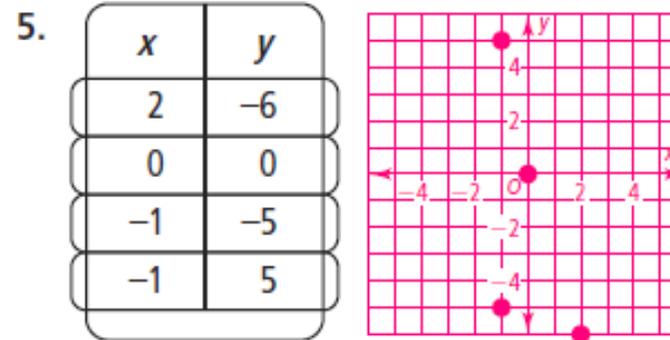
3. The temperature changed as Shelly preheated the oven, cooked the bread, and turned the oven off.



For each table, determine whether the relationship is a function. Then represent the relationship using words, an equation, and a graph.



function; the output is 4 more than the opposite of the input;  $y = -x + 4$



not a function

Each set of ordered pairs represents a function. Write a rule that represents the function.

6.  $(0, 0), (1, 3), (2, 6), (3, 9), (4, 12)$   
 $y = 3x$

7.  $(0, -8), (1, -7), (2, -6), (3, -5), (4, -4)$   
 $y = x - 8$

8.  $(0, -7), (1, -2), (2, 3), (3, 8), (4, 13)$   
 $y = 5x - 7$

9.  $(0, 8), (1, 6), (2, 4), (3, 2), (4, 0)$   
 $y = -2x + 8$

10.  $(-2, \frac{1}{16}), (-1, \frac{1}{4}), (0, 1), (1, 4), (2, 16)$   
 $y = 4^x$

11.  $(-2, \frac{10}{9}), (-1, \frac{4}{3}), (0, 2), (1, 4), (2, 10)$   
 $y = 3^x + 1$

Write a function rule that represents each sentence.

12. 1 more than two-thirds of  $a$  is  $b$ .  $\frac{2}{3}a + 1 = b$

13. 11 less than the product of a number  $y$  and  $-2$  is  $z$ .  $-2y - 11 = z$

14. 6 times the sum of a number  $t$  and 5 is  $s$ .  $6(t + 5) = s$

Identify the domain and range of each relation. Use a mapping diagram to determine whether the relation is a function.

15.  $\{(-3, 6), (0, 2), (1, 0), (2, -3)\}$

D:  $\{-3, 0, 1, 2\}$ ; R:  $\{-3, 0, 2, 6\}$ ;  
function

16.  $\{(-1, -4), (0, 0), (1, 4), (2, 8)\}$

D:  $\{-1, 0, 1, 2\}$ ; R:  $\{-4, 0, 4, 8\}$ ;  
function

Find the range of each function for the given domain.

17.  $f(x) = -2x + 1; \{-2, 0, 2, 4, 6\}$

R:  $\{-11, -7, -3, 1, 5\}$

18.  $f(x) = x^3 + 1; \{-2, -1, 0, 1, 2\}$

R:  $\{-7, 0, 1, 2, 9\}$

19.  $f(x) = -12x - 10; \{-3, -1, 0, 1, 3\}$

R:  $\{-46, -22, -10, 2, 26\}$

20.  $f(x) = x^2 - 7; \{-2, -1, 0, 3, 4\}$

R:  $\{-7, -6, -3, 2, 9\}$

Tell whether each sequence is arithmetic. Justify your answer. If the sequence is arithmetic, write a recursive and an explicit formula to represent it.

21. 15, 11, 7, 3, -1, ...

arithmetic;  $A(n) = A(n - 1) - 4;$

$A(n) = 15 + (n - 1)(-4)$

22. 7, 10, 14, 19, 25, ...

not arithmetic

23. What is  $f(-5)$  for the function  $f(x) = -9x - 3$ ? 42

**Do you UNDERSTAND?**

24. Reasoning If  $f(x) = -5x + 11$  and  $f(n) = 21$ , what is the value of  $n$ ?

Explain.

$-2$ ;  $21 = -5n + 11$  so  $10 = -5n$  and  $n = -2$

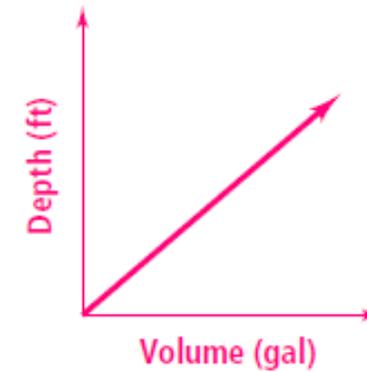
25. Open-Ended Write the explicit formula for an arithmetic sequence whose tenth term is 75.

Answers may vary. Sample:  $A(n) = 3 + (n - 1)8$

1. The average temperature increases throughout the months of April, May, and June.



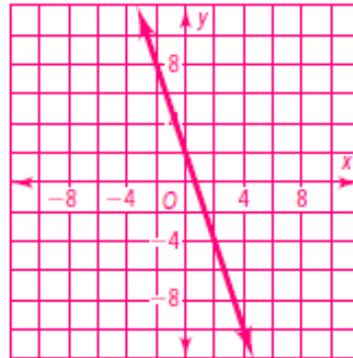
2. The depth of the water in feet in the pool increased as gallons of water were added.



For each table, determine whether the relationship is a function. Then represent the relationship using words, an equation, and a graph.

3.

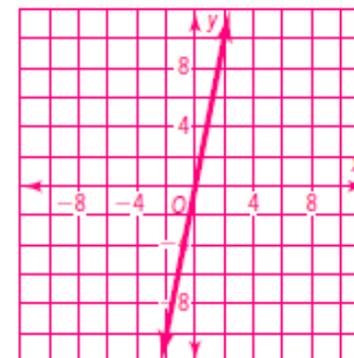
$x$	$y$
0	2
1	-1
2	-4
3	-7



Function; the value of  $y$  is the value of  $x$  multiplied by  $-3$  plus  $2$ ;  $y = -3x + 2$

4.

$x$	$y$
2	10
1	5
0	0
-1	-5



Function; the value of  $y$  is the value of  $x$  multiplied by  $5$ ;  $y = 5x$

Each set of ordered pairs represents a function. Write a rule that represents the function.

5.  $(0, 0), (1, 2), (2, 8), (3, 18), (4, 32)$   $y = 2x^2$

6.  $(0, 2), (1, 1), (2, 0), (3, -1), (4, -2)$   $y = -x + 2$

Write a function rule that represents each sentence.

7. 20 more than one half of  $x$  is  $y$ .  $y = \frac{1}{2}x + 20$

8. 9 less than the product of a number  $q$  and 5 is  $r$ .  $5q - 9 = r$

Identify the domain and range of each relation.

9.  $\{(-1, 5), (0, 6), (1, 7), (2, 9)\}$

Domain:  $\{-1, 0, 1, 2\}$ ;

Range:  $\{5, 6, 7, 9\}$

10.  $\{(14, -2), (8, 0), (6, 4), (1, 9)\}$

Domain:  $\{14, 8, 6, 1\}$ ;

Range:  $\{-2, 0, 4, 9\}$

Identify the domain and range of each relation.

9.  $\{(-1, 5), (0, 6), (1, 7), (2, 9)\}$

Domain:  $\{-1, 0, 1, 2\}$ ;Range:  $\{5, 6, 7, 9\}$ 

10.  $\{(14, -2), (8, 0), (6, 4), (1, 9)\}$

Domain:  $\{14, 8, 6, 1\}$ ;Range:  $\{-2, 0, 4, 9\}$ 

Find the range of each function for the given domain.

11.  $f(x) = -x + 5; \{-1, 1, 3, 5, 7\}$

 $\{6, 4, 2, 0, -2\}$ 

12.  $f(x) = x^3 + 2; \{-2, -1, 0, 1, 2\}$

 $\{-6, 1, 2, 3, 10\}$ 

Tell whether each sequence is arithmetic. Justify your answer. If the sequence is arithmetic, write a recursive and an explicit formula to represent it.

13.  $-1, 4, 9, 14, \dots$

Yes, the common difference is 5.

$A(n) = A(n - 1) + 5;$

$A(n) = -1 + (n - 1)(5)$

14.  $9, 12, 15, 19, \dots$

No, the sequence does not have a common difference.

15. What is  $f(-2)$  for the function  $f(x) = -3x + 8$ ? **14**

**Do you UNDERSTAND?**

16. **Reasoning** Do the ordered pairs  $(-5, 19)$ ,  $(-1, 7)$ ,  $(3, -5)$ ,  $(6, -14)$ , and  $(9, -23)$  represent a linear function? How do you know?

Yes, all of the ordered pairs satisfy the equation  $y = -3x + 4$ .

17. **Open-Ended** Write an example of a sequence that increases in a pattern, but is not an arithmetic sequence. Explain the pattern.

Answers may vary. Sample: 2, 4, 8, 16, 32, . . . ; You multiply each term by 2 to find the next term.