2-6 Functions

Objective: To complete function tables and to find function rules using tables.

Terms to Know

Function A relationship that pairs each number in a given set with exactly one number in a second set. For example, the set {1, 2, 3} may be related to the set {5, 6, 7} by pairing 1 with 5, 2 with 6, and 3 with 7.

Function rule A description of a function that shows *how* to pair the numbers in a given set with the numbers in a second set. For the example above, you can use the variable expression $x + 4$ to create a function rule. You would say: *a number x is paired with the number x + 4.*

Arrow notation The use of an arrow to replace the words *is paired with* in describing a function. For the example above, you would write the function rule using arrow notation as follows: $x \rightarrow x + 4$

Function table A listing of the numbers of a given set in a table that shows the pairing with numbers of a second set. For the example above, a function table could be prepared as shown at the right.

x	$x + 4$
1	5
2	6
3	7

Example 1 Complete the function table at the right.

x	$3x + 2$
2	8
4	14
6	?
8	?
10	?

Solution The function rule is $x \rightarrow 3x + 2$. Substitute 6, 8, and 10 for x in the expression $3x + 2$.

$3x + 2 = 3(6) + 2 = 20$

$3x + 2 = 3(8) + 2 = 26$

$3x + 2 = 3(10) + 2 = 32$

x	$3x + 2$
2	8
4	14
6	20
8	26
10	32

Complete each function table.

1.
x	$x - 2$
3	1
4	2
5	?
6	?
7	?

2.
x	$5x$
2	10
3	15
5	?
7	?
9	?

3.
x	$\dfrac{x}{2}$
4	2
8	4
12	?
16	?
20	?

4.
x	$4x - 4$
1	0
2	4
3	?
4	?
5	?

2-6 Functions *(continued)*

Example 2   Write a function rule for the function table shown at the right.

x	?
3	0
6	3
9	6
12	9
15	12

Solution   Notice the pattern. Each number in the second column is 3 less than the number in the first column.

$$3 - 3 = 0 \qquad 6 - 3 = 3 \qquad 9 - 3 = 6$$
$$12 - 3 = 9 \qquad 15 - 3 = 12$$

The function rule is $x \rightarrow x - 3$.

Use each function table to find the function rule.

5.

x	?
3	0
4	1
5	2
6	3
7	4

6.

x	?
4	11
8	15
12	19
16	23
20	27

7.

x	?
1	9
2	18
3	27
4	36
5	45

8.

x	?
7	22
8	23
9	24
10	25
11	26

9.

x	?
5	1
7	3
9	5
11	7
13	9

10.

x	?
6	2
12	4
18	6
24	8
30	10

Spiral Review

11. Complete the function table at the right. *(Lesson 2-6)*

12. Find the quotient: $104.88 \div 7.6$ *(Toolbox Skill 14)*

13. Find the answer: 16^2 *(Lesson 1-9)*

14. Simplify: $6n + 5n - 2m$ *(Lesson 2-3)*

15. Find the difference: $7\frac{5}{6} - 3\frac{7}{12}$ *(Toolbox Skill 19)*

x	$4x + 7$
2	15
4	23
6	?
8	?
10	?