1.7 Represent Functions as Rules and Tables

Before   You wrote algebraic expressions and equations.

Now   You will represent functions as rules and as tables.

Why?   So you can describe consumer costs, as in Example 1.
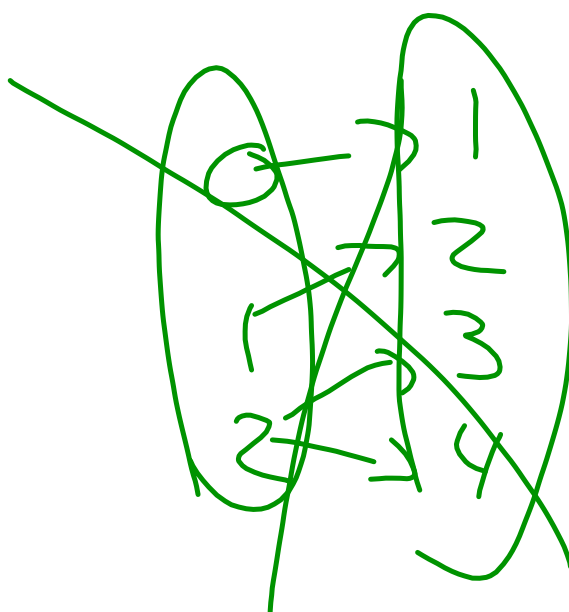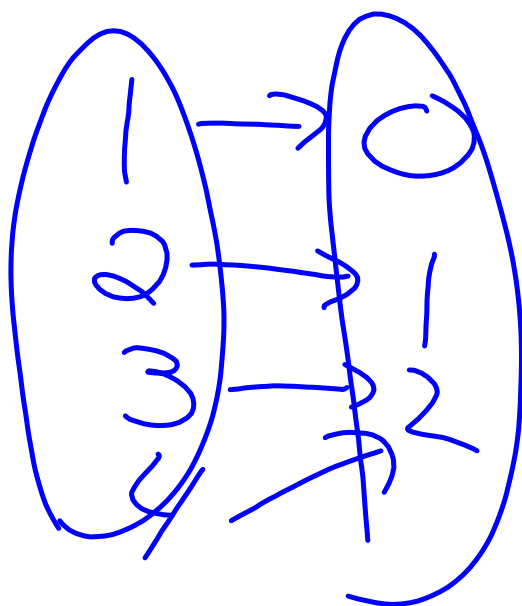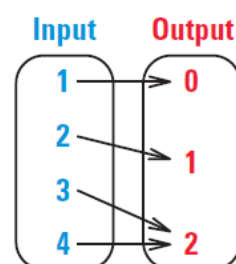
A **function** consists of:

- A set called the **domain** containing numbers called **inputs**, and a set called the **range** containing numbers called **outputs**.

- A pairing of inputs with outputs such that each input is paired with exactly one output.

MAPPING DIAGRAMS A function may be represented by a *mapping diagram*. Notice that an output may be paired with more than one input, but no input is paired with more than one output.

Input	Output
1	0
2	1
3	
4	2

LESSON 1.7 **Practice A**

For use with the lesson "Represent Functions as Rules and Tables"

Complete the sentence.

1. The collection of all output values is called the ___?___ of a function.

   RANGE

2. The collection of all input values is called the ___?___ of a function.

   Domain

Identify the domain and range of the function.

3.

Input	Output
1	8
3	7
5	6
7	5

4.

Input	Output
7	4
2	2
5	1
3	5

5.

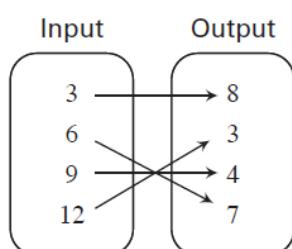| Input	Output
0.4	15
0.5	13
0.6	11
0.7	9

$D: \{1, 3, 5, 7\}$
$R: \{8, 7, 6, 5\}$

$D: \{.4, .5, .6, .7\}$
$R: \{15, 13, 11, 9\}$

Tell whether the pairing is a function.

6.

Input	Output
3 → 8
6 → 3
9 → 4
12 → 7

YES

7.

Input	Output
6	3
3	1
0	2
3	4

NO

8.

Input	Output
10	9
11	3
12	6
13	9

YES

Make a table for the function. Identify the range of the function.

9. $y = 4x$

Domain: 0, 1, 2, 3

10. $y = x + 2$

Domain: 11, 15, 22, 27

11. $y = x - 3$

Domain: 5, 9, 14, 19

X	Y
0	0
1	4
2	8
3	12

0, 4, 8, 12

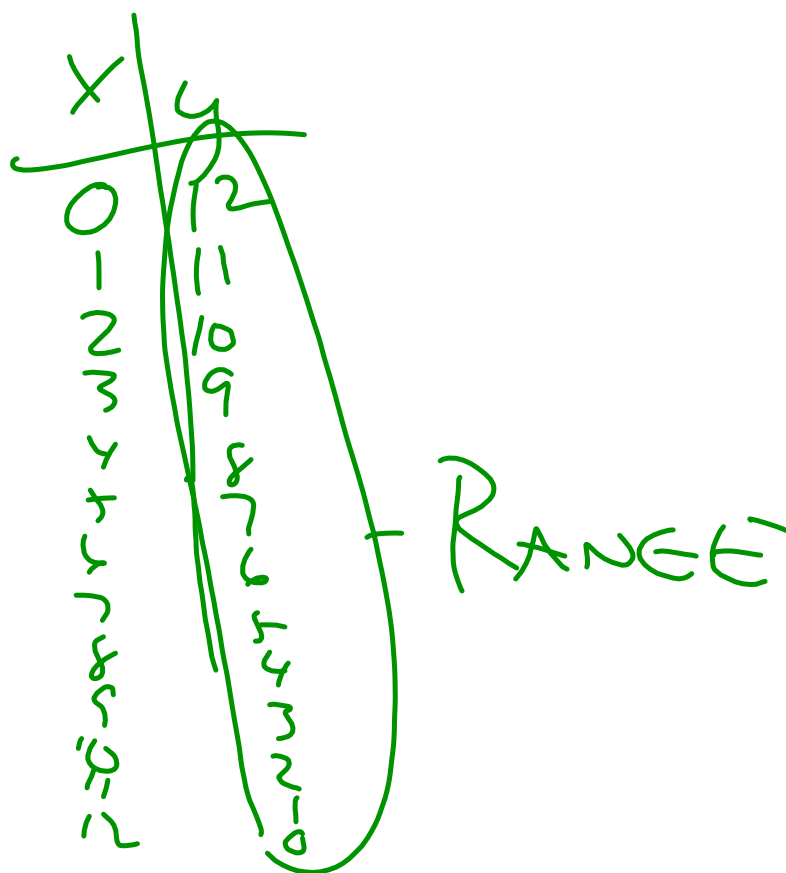| X	Y
5	2
9	6
14	11
19	16

2, 6, 11, 16

12. Flower Garden You have a flat of 12 plants that you are planting in a garden.

   a. Copy and complete: Each time you put one plant in the garden, you have one less plant in the flat, so __?__ is a function of __?__.

   b. Write a rule for the number of plants y you have left in the flat as a function of the number of plants x you have put in the garden so far.

   c. Make a table and identify the range of the function.

The # that are left relies on the # which are planted

$$y = 12 - x$$

x	y
0	12
1	11
2	10
3	9
4	8
5	7
6	6
7	5
8	4
9	3
10	2
11	1
12	0

← RANGE

13. **Centerpieces** A florist is making centerpieces for a charity event. She is using 9 flowers in each centerpiece. Write a rule for the total number of flowers used as a function of the number of centerpieces created.

$$y = 9x$$

14. Kickboxing You join a kickboxing class at a local gym. The cost is $5 per class plus $25 for the initial membership fee. Write a rule for the total cost of the class in dollars as a function of the number of classes you attend. How much will it cost if you go to 8 classes?

$$y = 25 + 5x$$

$$= 25 + 5 \cdot 8$$

$$y = 65$$