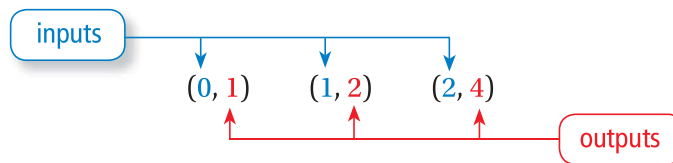


7.1 Lesson

Key Vocabulary

input, p. 276
output, p. 276
relation, p. 276
mapping diagram,
p. 276
function, p. 277

Ordered pairs can be used to show **inputs** and **outputs**.



Key Ideas

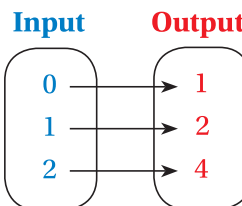
Relations and Mapping Diagrams

A **relation** pairs inputs with outputs. A relation can be represented by ordered pairs or a **mapping diagram**.

Ordered Pairs

(0, 1)
(1, 2)
(2, 4)

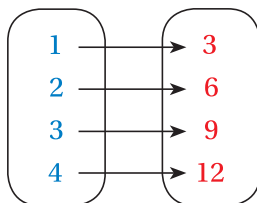
Mapping Diagram



EXAMPLE 1 Listing Ordered Pairs of Relations

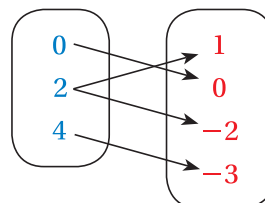
List the ordered pairs shown in each mapping diagram.

a. Input Output



▶ The ordered pairs are (1, 3), (2, 6), (3, 9), and (4, 12).

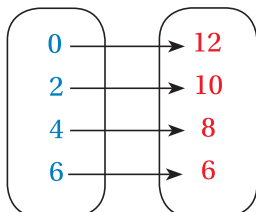
b. Input Output



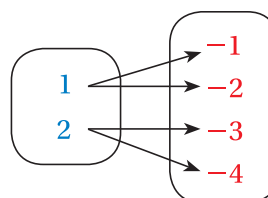
▶ The ordered pairs are (0, 0), (2, 1), (2, -2), and (4, -3).

Try It List the ordered pairs shown in the mapping diagram.

1. Input Output



2. Input Output

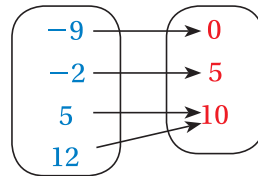


A relation that pairs each input with *exactly one* output is a **function**.

EXAMPLE 2 Determining Whether Relations Are Functions

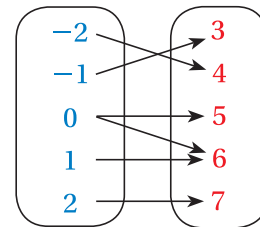
Determine whether each relation is a function.

a. **Input** **Output**



▶ Each input has exactly one output. So, the relation is a function.

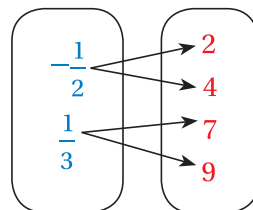
b. **Input** **Output**



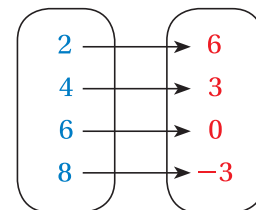
▶ The input 0 has two outputs, 5 and 6. So, the relation is *not* a function.

Try It Determine whether the relation is a function.

3. **Input** **Output**



4. **Input** **Output**



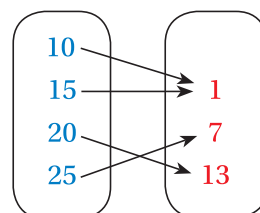
Self-Assessment for Concepts & Skills

Solve each exercise. Then rate your understanding of the success criteria in your journal.

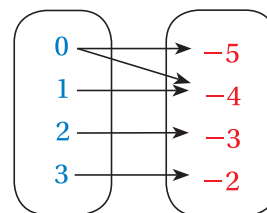
5. **MP PRECISION** Describe how relations and functions are different.

IDENTIFYING FUNCTIONS List the ordered pairs shown in the mapping diagram. Then determine whether the relation is a function.

6. **Input** **Output**



7. **Input** **Output**



8. **OPEN-ENDED** Copy and complete the mapping diagram at the left to represent a relation that is a function. Then describe how you can modify the mapping diagram so that the relation is *not* a function.

