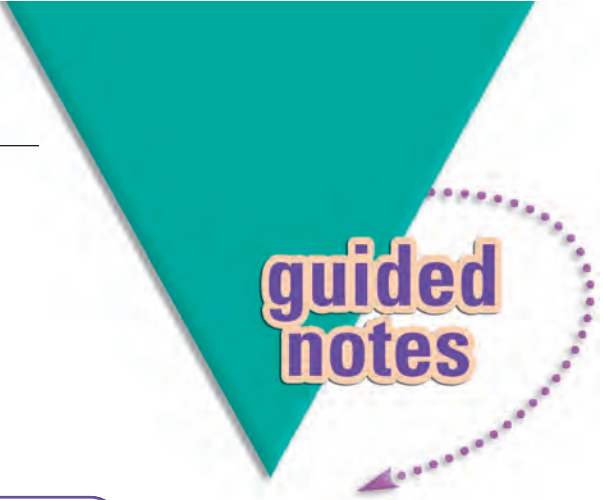


NAME \_\_\_\_\_

**Module 9** Using Functions  
**Lesson 1** Defining Relations and Functions



guided  
notes

### Lesson Objectives

- Represent a relation in set notation, a table, a mapping diagram, a coordinate graph, an equation, and a relation rule.
- Determine domain and range of a relation.
- Determine whether a relation is a function.

A **relation** \_\_\_\_\_ is a set of ordered pairs.

The set of all first coordinates of the ordered pairs is called the **domain** \_\_\_\_\_ of the relation.

The set of all second coordinates is called the **range** \_\_\_\_\_ of the relation.

Another way to represent a relation is to use a **mapping diagram** \_\_\_\_\_.

The elements of the domain are called **inputs** \_\_\_\_\_, and the elements of the range are called **outputs** \_\_\_\_\_.

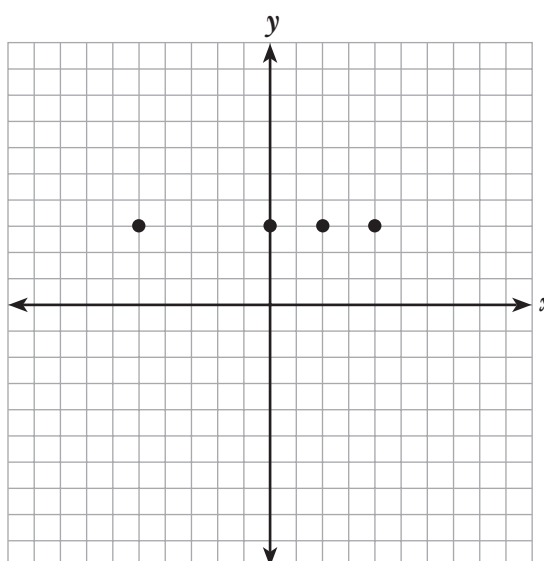
Sometimes a relation is represented by a **table** \_\_\_\_\_.

Another way to represent a relation is to draw its **graph** \_\_\_\_\_.

**1** Find the domain and range of the relation shown.

**domain = {-5, 0, 2, 4}** \_\_\_\_\_

**range = {3}** \_\_\_\_\_



Ways to represent a **relation** \_\_\_\_\_:

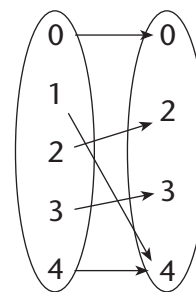
- set of ordered pairs
- mapping diagram
- table
- equation
- graph

2 Represent the relation shown in the mapping diagram as a set of ordered pairs. Then, determine the domain and range of the relation.

**$\{(0, 0), (1, 4), (2, 2), (3, 3), (4, 4)\}$**

**domain =  $\{0, 1, 2, 3, 4\}$**

**range =  $\{0, 2, 3, 4\}$**



A **function** \_\_\_\_\_ is a relation that assigns to each element of the domain exactly one element of the range.

When no two elements of the domain are mapped to the same elements of the range, it is called **one-to-one** \_\_\_\_\_ mapping.

A **horizontal** \_\_\_\_\_ line is a constant function.

A **linear** \_\_\_\_\_ function is a function whose graph is a line or part of a line.

If a **vertical** \_\_\_\_\_ line passes through no more than one point of the graph of a relation, then the relation is a function.

3 Use the vertical line test to determine which graphs represent functions.

**a and c**

