

## Section 2.1 Basics of Functions and Their Graphs

### Definition of a Relation

A **relation** is any set of ordered pairs. The set of all the first components of the ordered pairs is called the **domain** of the relation and the set of all second components is called the **range** of the relation.

### Definition of a Function

A **function** is a correspondence from a first set, called the **domain**, to a second set, called the **range**, such that each element in the domain corresponds to *exactly one* element in the range.

- A function is a relation in which no two ordered pairs have the same first component and different second components.
- A function can have two different first components with the same second component.

### Independent Variable

The variable  $x$  is called the **independent variable** because it can be assigned any value from the domain.

### Dependent Variable

The variable  $y$  is called the **dependent variable** because its value depends on  $x$ .

Example 1: Determine whether each relation is a function. Give the domain and range for each relation.