

## Section 2.1

# 5

A **set** is a collection of objects whose contents can be clearly determined.

- The objects in a set are called the **elements, or members**, of the set.
- A set must be **well defined**, meaning that its contents can be clearly determined.
- Sets can be designated by word descriptions, the roster method (a listing within braces, separating elements with commas), or a set-builder notation.

Example 1: Write a word description of the set:  $L = \{a, b, c, d, e, f\}$

Example 2: Set M is the set of months beginning with the letter A. Express this set using the roster-method.

Example 3: Express the set  $O = \{x \mid x \text{ is a positive odd number less than } 10\}$  using the roster method.

The **empty set**, or **the null set**, represented by  $\{ \}$  or  $\emptyset$  is a set that contains no elements.

Example 4: Which one of the following is the empty set?

- $\{x \mid x \text{ is a number less than } 3 \text{ or greater than } 5\}$
- $\{x \mid x \text{ is a number less than } 3 \text{ and greater than } 5\}$
- nothing
- $\emptyset$

The symbol  $\in$  is used to indicate that an object is an element of a set.

- The symbol  $\in$  is used to replace the words "is an element of."

The symbol  $\notin$  is used to indicate that an object is not an element of a set.

- The symbol  $\notin$  is used to replace the words "is not an element of."