

Extension

Use after Lesson 2.1

Apply Sets to Numbers and Functions



GOAL Apply set theory to numbers and functions.

Key Vocabulary

- set
- element
- empty set
- universal set
- union
- intersection

A **set** is a collection of distinct objects. Each object in a set is called an **element** or *member* of the set. You can use *set notation* to write a set by enclosing the elements of the set in braces. For example, if A is the set of whole numbers less than 6, then $A = \{0, 1, 2, 3, 4, 5\}$.

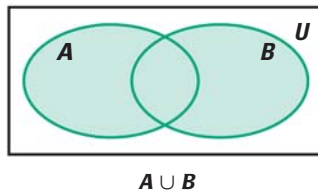
Two special sets are the *empty set* and the *universal set*. The set with no elements is called the **empty set** and is written as \emptyset . The set of all elements under consideration is called the **universal set** and is written as U .

KEY CONCEPT

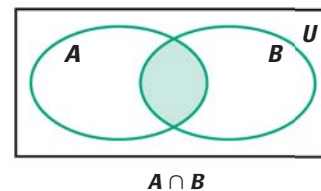
For Your Notebook

Union and Intersection of Two Sets

The **union** of two sets A and B is the set of all elements in *either* A or B and is written as $A \cup B$.



The **intersection** of two sets A and B is the set of all elements in *both* A and B and is written as $A \cap B$.

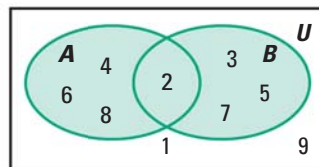


EXAMPLE 1 Find the union and intersection of two sets

Let U be the set of integers from 1 to 9. Let $A = \{2, 4, 6, 8\}$ and $B = \{2, 3, 5, 7\}$. Find (a) $A \cup B$ and (b) $A \cap B$.

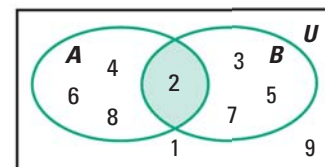
Solution

- a. The union of A and B consists of the elements that are in either set.



▶ $A \cup B = \{2, 3, 4, 5, 6, 7, 8\}$

- b. The intersection of A and B consists of the elements that are in both sets.



▶ $A \cap B = \{2\}$