

Review - Basic Set Theory

Consider the universal set $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$.

- **Subset.** A set A is said to be a *subset* of U , if all elements (or entries) of A are in U . In this case, we write $A \subseteq B$.

- **Complement.** The *complement* of set A , written as A^c , is the set containing all elements of U that are not in A .

- **Union.** The *union* of A and B , written as $A \cup B$, is the set of elements that belong to either A or B or both. That is,

$$A \cup B = \{x | x \text{ is in } A \text{ or } x \text{ is in } B\}.$$

- **Intersection.** The *intersection* of A and B , written as $A \cap B$, is the set of elements that belong to both A and B . That is,

$$A \cap B = \{x | x \text{ is in } A \text{ and } x \text{ is in } B\}.$$

- **Properties:**

1. Commutativity

- a. $A \cup B = B \cup A$
- b. $A \cap B = B \cap A$

2. De Morgan's Laws

- a. $(A \cup B)^c = A^c \cap B^c$
- b. $(A \cap B)^c = A^c \cup B^c$