Section 2.2: Set Operation

Example 1: Let $U = \{ a, b, c, d, e, f, g, h, i \}$ with the following subsets

\[ A = \{ a, b, d, e \} \quad , \quad B = \{ b, c, e, f, g \} \quad , \quad C = \{ e, f, h, i \} \]

Find the following:

a) $A'$

b) $B'$

c) $A \cup B$: The union of $A$ and $B$ is the set of all elements that are in $A$ or $B$ (or both)

d) $A \cap B$: The intersection of $A$ and $B$ is the set of all elements that are in $A$ and $B$.

e) $A \cap (B \cup C)$

f) $(A \cap B) \cup C$
Example 1 Cont.: Let \( U = \{a, b, c, d, e, f, g, h, i\} \) with the following subsets
\[
A = \{a, b, d, e\}, \quad B = \{b, c, e, f, g\}, \quad C = \{e, f, h, i\}
\]

g) \( A - B \): What is in \( A \) and not in \( B \)

h) \( B - A \): What is in \( B \) and not in \( A \)

i) \( U - A \): What is \( U \) and not in \( A \), which is the same as \( A' \)

Example 2: If \( A = \{1, 2, 3\} \), \( B = \{5, 6, 7\} \), \( C = \{2, 4\} \)

Find the following

a) \( A \cup B \):

b) \( A \cap B \):

c) \( A - B \)

d) \( A \times C \) (Cartesian product)

e) \( C \times A \)