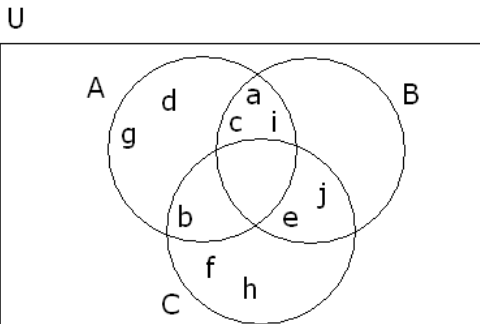


- Let $A = \{2, 3, 5, 6, 8, 9, 10\}$ and $B = \{1, 3, 4, 8, 10\}$. Label each of the following statements as true or false.
 - $2 \in A$
 - $2 \in B$
 - $3 \in A \cap B$
 - $9 \in A \cup B$
- Let $A = \{1, 4, 5, 7, 9, 10\}$, $B = \{2, 7, 8, 10\}$, and $C = \{1, 3, 5, 7\}$. Compute each of the following.
 - $(A \cap B) \cup C$
 - $A \cap (B \cup C)$
 - $(A \cap C) \cup (B \cap C)$
 - $A \cup (B \cap C)$
 - $A \cap (B \cap C)$
- List all subsets of $M = \{1, 2, 3\}$.
- Let $A = \{2, 3, 5, 6, 8, 9, 10\}$ and $B = \{1, 3, 4, 8, 10\}$.
 - Find $A \cap B$.
 - Find $A \cup B$.
 - How many subsets does A have? (You don't have to list them.)
 - How many subsets does B have? (You don't have to list them.)
- Consider the picture shown below. Find each of the following.
 - $A \cap B$
 - $B \cup C$
 - $(A \cup B) \cap C$



- Let $A = \{3, 4, 6, 7, 10\}$ and $B = \{2, 5, 6, 10\}$.
 - How many subsets does A have? You do NOT have to list them.
 - Find $A \cap B$
 - Find $A \cup B$
 - List all two-element subsets of $A \cup B$.
 - List all subsets of $B = \{2, 5, 6, 10\}$.
- Suppose that X and Y are sets such that $|X| = 4$ and $|Y| = 3$.
 Hint: To answer the following questions, come up with a few examples of such sets. For example, $X = \{1, 2, 3, 4\}$ and $Y = \{1, 2, 3\}$ will be different from $X = \{1, 2, 3, 4\}$ and $Y = \{4, 5, 6\}$. You need to consider all such possibilities, but there aren't that many.
 - Is it possible that $|X \cup Y| = 10$?
 - Is it possible that $|X \cup Y| = 4$?
 - Is it possible that $|X \cup Y| = 2$?
 - Is it possible that $|X \cap Y| = 4$?
 - Is it possible that $|X \cap Y| = 2$?
 - Is it possible that $|X \cap Y| = 2$ and $|X \cup Y| = 6$?
- How many different 4-digit numbers can be formed using the digits 1, 3, 7, 8, and 9,
 - if repetition of digits is allowed
 - if repetition of digits is not allowed?
- If I have 3 different pairs of shoes, 2 dresses, and 2 jackets, how many different outfits are possible to wear? (An outfit consists of one pair of shoes, one dress, and one jacket).
- We toss a coin twice in a row. List all possible outcomes. (For example, one possible outcome is HT , i.e. head for the first, tail for the second toss.)

11. We throw a die twice in a row. How many different outcomes are possible. (For example, one possible outcome is $(2, 5)$ i.e. the first roll is a 2 and the second roll is a 5.)
12. a) There are ten people in a room. If everyone shakes hands with everyone, how many handshakes took place?
b) There are twenty people in a room. If everyone shakes hands with everyone, how many handshakes took place?