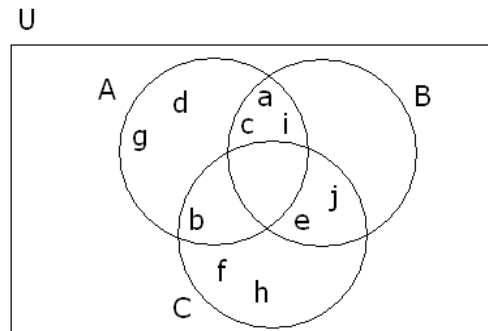
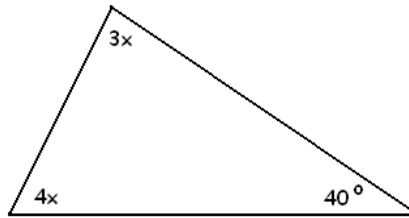


- Let  $A = \{2, 3, 5, 6, 8, 9, 10\}$  and  $B = \{1, 3, 4, 8, 10\}$ . Label the following statements as true or false.
  - $2 \in A$
  - $2 \in B$
  - $3 \in A \cap B$
  - $9 \in A \cup B$
- List all subsets of  $M = \{1, 2, 3\}$ .
- Let  $A = \{2, 3, 5, 6, 8, 9, 10\}$  and  $B = \{1, 3, 4, 8, 10\}$ .
  - Find  $A \cap B$ .
  - Find  $A \cup B$ .
  - How many proper subsets does  $B$  have? (You don't have to list them.)
  - How many subsets does  $A$  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  $|Y| = 3$ . To answer the following questions, come up with a few examples of such sets.
  - 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 5-digit numbers can be formed using the digits 1, 2, 3, 4, and 5, without repetition? (You don't have to list all these numbers.)
- 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.)
- 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.)

11. Find the value of  $x$  based on the picture below.



12. a) There are four people in a room. If everyone shakes hands with everyone, how many handshakes took place?  
b) There are five people in a room. If everyone shakes hands with everyone, how many handshakes took place?