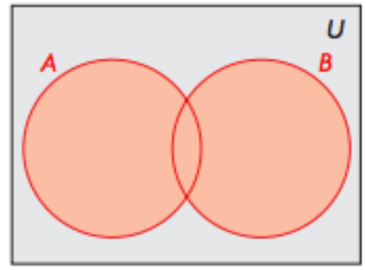
1.3 Intersection and Union of sets Notes

Terms:

Union: The set of all elements in two or more sets; in set notation, $A \cup B$ denotes the union of sets A and B;

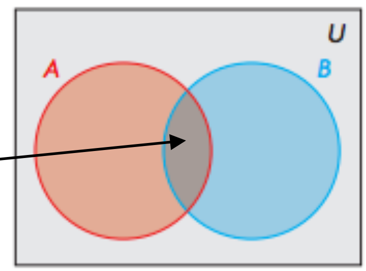
- In the diagram, it refers to Both the areas of A and B
- The sets don't need to overlap
- It is indicated by the word "or"



$A \cup B$

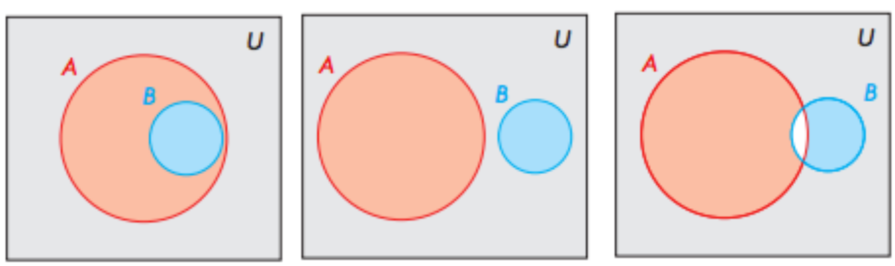
Intersection: The set of elements that are common to two or more sets. In set notation, $A \cap B$ denotes the intersection of set A and B

- In the diagram, it refers to the area that it shaded in the middle
- if the sets do not overlap (disjoint) the intersection would be empty and denoted $A \cap B = \{\}$
- it is indicated by the word "and"



$A \cap B$

Subtraction: the set of elements in A minus the Set of elements in B that both sets share. A\B is read as "A minus B".



$A \setminus B$ when $B \subset A$ $A \setminus B$ when they are disjoint $A \setminus B$ when they intersect

The number of elements in A or B can also be determined as follows:

$$n(A \cup B) = n(A \setminus B) + n(B \setminus A) + n(A \cap B)$$

Principle of Inclusion and Exclusion: The number of elements in the union of two sets is equal to the sum of the number of elements in each set, less the number of elements in both sets:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$