Set Theory and Venn Diagrams

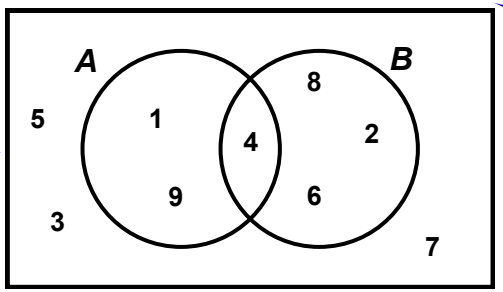
A set is a well defined collection of distinct objects, called elements.

A set is denoted by a capital letter.

$\varepsilon=\{1,2,3,4,5,6,7,8,9\}$
$A=\{\text{square numbers}\}$
$B=\{\text{even numbers}\}$

A set can be a defined by a list.

A set can be described



ε - denotes the universal set.
This is the set containing all of the elements being considered.

Why is the number 10 missing from this Venn diagram?

This is called a Venn Diagram.
All the elements of **ε** have been entered on the Venn diagram.

Why has the number 4 been placed where it is?
What about the other numbers?
Discuss this with your team.

A^c - denotes the set of elements not in **A** (the complement of ***A***).

So $A^c=\{2,3,5,6,7,8\}$

$A \cap B$ means A and B, that is elements in both A and B.

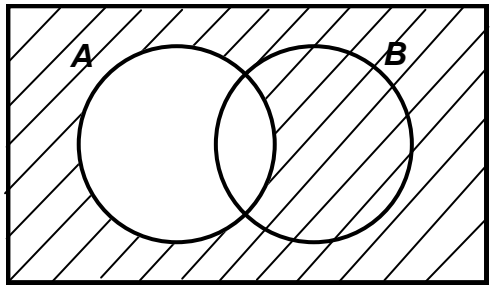
So $A \cap B = \{4\}$

$A \cup B$ means A or B, that is elements in A or B (or both).

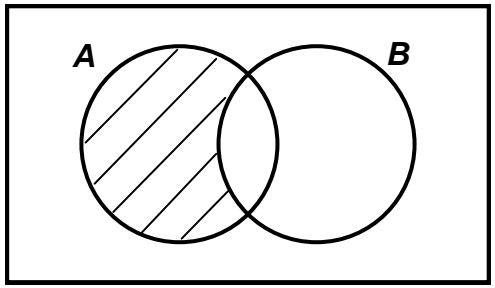
So $A \cup B =\{1,2,4,6,8,9,\}$

n(***A***) - denotes the number of elements in **A**.
So n(***A***) = 3.

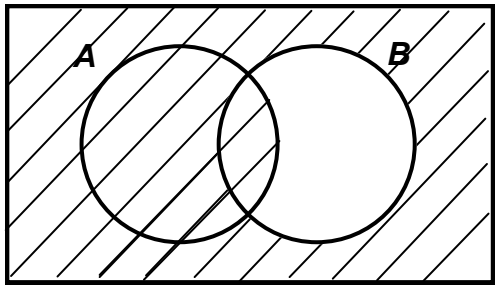
Find:
n(***B***), n(**ε**), n(B^c), n($A \cup B$).



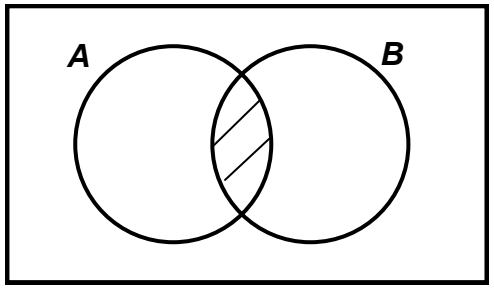
The shaded area is A^c .



This is $A \cap B^c$ or $(A^c \cup B)^c$



The is $A \cup B^c$ or $(A^c \cap B)^c$



The shaded area is $A \cap B$.

Venn diagrams can be shaded to show different relationships. Study careful the examples and the descriptions above.
Shade and describe Venn diagrams involving three sets ***A, B*** and ***C*** (turn over sheet). Discuss with your team.

Three Set Venn Diagrams