

Sets

Class 1

Example 1 Write out all the subsets of $A = \{a, b, c\}$

Example 2 38 people in a group. 21 play football and 28 play hurling. 4 play no sport, how many play both?

Example 3 There are 24 students in a class. 16 study science. Twice as many study business as study both, if everyone studies at least one subject how many study business only?

Example 4 If $\#A = 12$ and $\#B = 8$ find
the maximum value of $A \cup B$.
the minimum value of $A \cup B$.

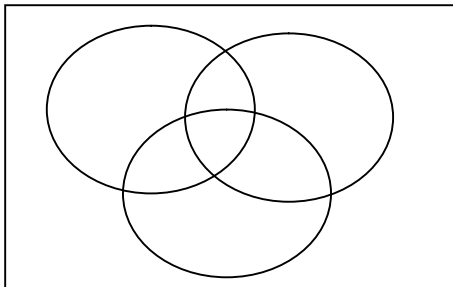
Example 5 In a group of 30 people, 18 read paper A and 15 read paper B
find
the maximum number of people that read a paper
the minimum number of people that read a paper.

Example 6 When $\#U = u$, $\#A = a$, $\#B = b$, $\#(A \cap B) = x$ and $\#(A \cup B) = y$
Write y in terms of a , b , x and u .

Class 2

Example 1 U is the universal set and A, B and C are three subsets of U.

$$\begin{aligned}
 B &= \{a, b, c, d\} \\
 (B \cap C) \setminus A &= \{c\} \\
 A \cap B &= \{a, b, d\} \\
 A \setminus C &= \{d, e, f\} \\
 (A \cup B \cup C)' &= \{g\} \\
 C \setminus B &= \{h, i\} \\
 A' &= \{c, g, i\}
 \end{aligned}$$



Copy the Venn diagram and complete it to show the elements in each part of each set.

Example 2 A survey was taken of a group of 44 students, each of whom was studying one or more of three subjects History, Geography and Art.

28 students studied History.

30 students studied Geography.

22 students studied Art.

6 students studied History only.

15 students studied both History and Geography.

3 students studied all three subjects.

- (i) Use a Venn diagram to find the number of students who studied History and Geography but not Art.
- (ii) How many students studied History and Art but not Geography?
- (iii) Find the number of students who studied Geography only.

Example 3 A survey was taken of a group of 54 students, each of whom was studying one or more of three subjects A, B or C.

6 students studied B and C.

5 students studied A and C.

3 times as many students studied A and B as studied all 3 subjects.

20 students altogether studied B.

17 students studied C only.

14 students studied A only.

Using x to represent those students who studied all 3 subjects, illustrate the above information in a Venn diagram and hence calculate the value of x .

