

NICKS & TRICKS

GUIDE TO 1st YEAR MATHS

Sets & Venn Diagrams

Always Remember!

1. What is a **set**?

A set is a **group of objects**. These objects are called **elements**.

Example: The set of things in my fridge has the following elements:
{Milk, butter, cheese, carrots, ham}

The set of things that go in a sandwich has the following elements:

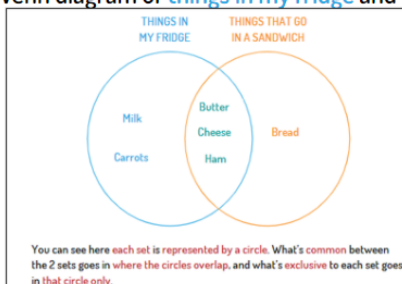
{Bread, butter, cheese, ham}

We use these curly brackets to show the elements of a set!

2. What is a **Venn Diagram**?

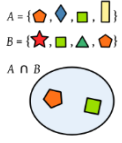
Venn diagrams used to show what's **common between 2 or more sets**.

Example: Here a Venn diagram of **things in my fridge** and **things that go in a sandwich**

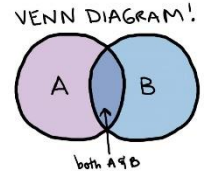


3. Set Notations

Symbol	Pronounced	Explanation
\in	"is an element of"	Part of a set. $1 \in A$
\notin	"is not an element of"	Not part of a set. $1 \notin B$
\subset	"is a subset of"	Contained entirely in another set. $B \subset A$
$\not\subset$	"is not a subset of"	Not contained entirely in another set. $A \not\subset B$
\cup	"union"	Combined. Shaded area here shows $A \cup B$
\cap	"intersection"	What is common. Shaded area here shows $A \cap B$
\setminus	"without"	Without. Shaded area here shows $A \setminus B$
\emptyset or $\{\}$	"the null set" or "the empty set"	A set without any elements in it.
A'	"A complement"	Everything except A. Shaded area here shows A'
U	"the universal set"	Every element in the Venn diagram. Here $U = \{1,2,3,4\}$
$\#$	"the cardinal number" or "the total number of elements"	Number of elements in a set. $\#A = 4$

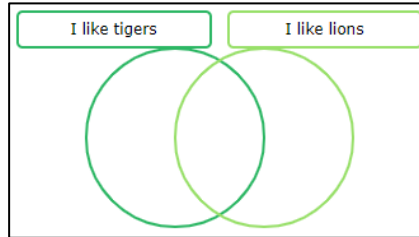


Worked Example

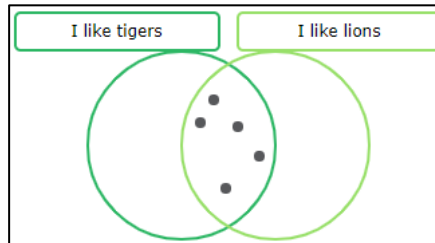


Of the people in Kinsley's family, **9 like tigers** and **10 like lions**. 5 people like both tigers and lions. How many people like lions but not tigers?

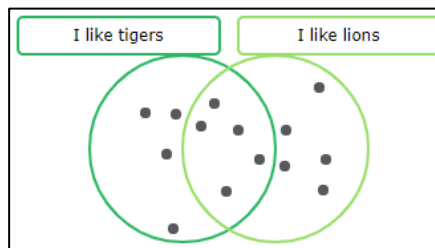
Hint: Copy and complete the Venn diagram below to help you solve the problem.



5 people like both tigers and lions. Put 5 dots in the area that is in both circles.



Now add dots to the other two areas until there are 9 dots in the "I like tigers" circle and 10 dots in the "I like lions" circle.



Count the dots that are in the "I like lions" circle but are not in the "I like tigers" circle. There are 5 dots.

5 people like lions but not tigers.

1 Question – 10 mins – Time yourself!

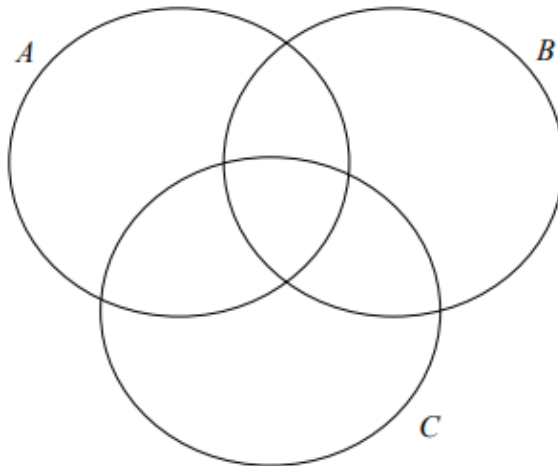
2015 P.1 Q.1

Question 1:

The sets A , B , and C are as follows:

$$A = \{1, 2, 3, 5, 6, 7\} \quad B = \{2, 3, 4, 5, 8, 9\} \quad C = \{1, 4, 5, 10\}.$$

(a) Complete the Venn diagram below.



From above:

(b) List the elements of each of the following sets.

$$A \cup B = \underline{\hspace{4cm}}$$

$$A \setminus C = \underline{\hspace{4cm}}$$

$$A \cup (B \cap C) = \underline{\hspace{4cm}}$$

Refer to your
set notations!

From above:

(c) Complete the following identity.

$$A \cup (B \cap C) = (A \cup B) \cap (\underline{\hspace{2cm}})$$