NICKS & TRICKS

LUKE'S GUIDE TO JUNIOR CERT HL MATHS

Topic 4 – Sets & Venn Diagrams

This is a Paper 1 topic. Venn diagrams are used to show information about different sets. There is also some language and notation we use to describe which part of a Venn diagram we are talking about. Learn the nicks & tricks below to breeze through any sets question on your exam!

(i)   What is a Set/Venn Diagram?
(ii)   Set Notation
(iii)   Venn Diagrams

(i) WHAT IS A SET/VENN DIAGRAM?

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!

Venn diagrams are then used to show what's common between different sets. Example: here's the Venn diagram of things in my fridge and things that go in a sandwich:

THINGS IN
MY FRIDGE

THINGS THAT GO
IN A SANDWICH

Milk

Butter

Cheese

Bread

Carrots

Ham
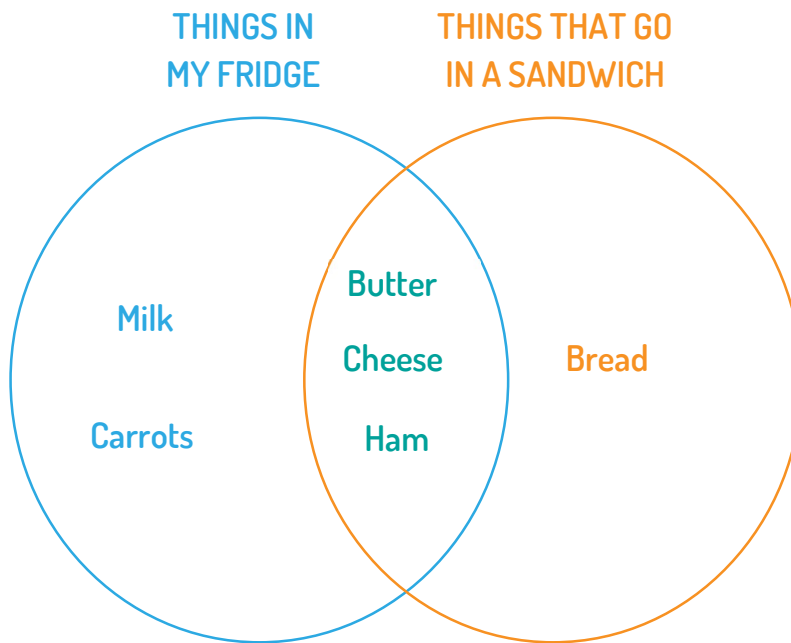
You can see here each set is represented by a circle. What's common between the 2 sets goes in where the circles overlap, and what's exclusive to each set goes in that circle only.

(ii) SET NOTATION

This is language we use to talk about specific parts of a Venn diagram or set.
For examples we will be using the following sets and Venn diagram:

A = {1,2,3,4}

B = {2,4}
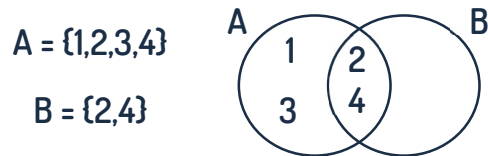
Symbol	Pronounced	Explanation
∈	"is an element of"	Part of a set. 1 ∈ A
∉	"is not an element of"	Not part of a set. 1 ∉ B
⊂	"is a subset of"	Contained entirely in another set. B ⊂ A
⊄	"is not a subset of"	Not contained entirely in another set. A ⊄ B
∪	"union"	Combined. Shaded area here shows A ∪ B
∩	"intersection"	What is common. Shaded area here shows A ∩ B
\	"without"	Without. Shaded area here shows A \ B
∅ 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

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(iii) VENN DIAGRAMS

Venn Diagram exam questions normally ask you to figure out a value in the Venn Diagram or test your set notation knowledge. Learn the previous 2 sections and this one will be easy! PAY CAREFUL ATTENTION TO THE WORDING OF THESE QUESTIONS.

Example: In a class, there are 100 students. 42 play football only, 7 play both football and basketball, and 23 do not play either sport. Find the value of x in the Venn Diagram below:

U

| FOOTBALL | BASKETBALL | 23 |
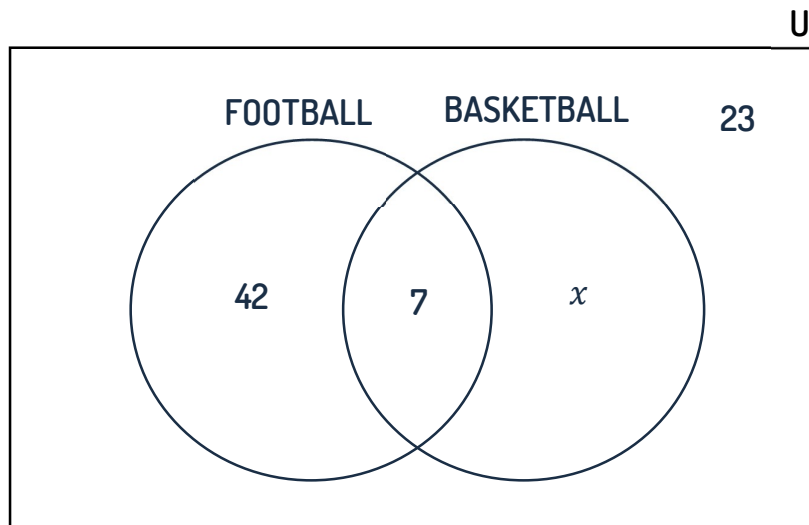
42   7 x

100 students total
↳ all values on Venn Diagram must add up to 100:

$$100 = 23 + 42 + 7 + x$$
$$x = 100 - 23 - 42 - 7$$
$$x = 28$$

LUKE'S EXAM PREDICTIONS

➢ Venn Diagrams have come up at least once every year for the past 5 years!
➢ Set Notation has come up at least once every year for the past 5 years!

Learning set notation is key to acing every set question on your exam, so keep this table handy and learn those symbols off by heart!

"How do you eat an elephant? One bite at a time!"

BREAKTHROUGH MATHS