Set Theory

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A set is an unordered collection of objects, called elements or members

Set *V* of vowels in the English alphabet would be *V = {a,e,i,o,u}*

Q1: Write down the set *E* of positive even integers less than 10

$E = \{2, 4, 6, 8\}$

Q2: Write down the set *D* of days of the week (the first three letters will do)

$D = \{Mon, Tues, Wed, Thu, Fri, Sat, Sun\}$

Q3: Write down the set *F* of factors of 24 $F = \{1, 2, 3, 4, 6, 8, 12, 24\}$

Q4: Write down the set *P* of prime numbers less than 14 $P = \{2, 3, 5, 7, 11, 13\}$

We can use **set builder** notation by stating the property/properties of the members

Eg $E = \{x \mid x$ is an even positive integer less than 10$\}$

such that: or :

is a member of	2	$\in$	E	is not a member of	1	$\notin$	E

Q5: Write down the set *S* of prime factors of 24 $S = \{2, 3\}$

Q6: Write down the set of positive even numbers $\{2, 4, 6, ..\}$ ← ellipsis

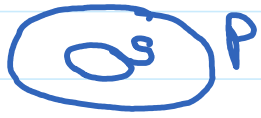
A set where all the members of the set are contained within another set is called a subset

That is set A is a subset of B if and only if every element of A is also an element of B

Is a subset of	$\subseteq$			Is not a subset of	$\not\subseteq$		

S is a subset of P $S \subseteq P$ E is not a subset of P $E \not\subseteq P$

We can use **Venn diagrams** to illustrate sets visually.



Q7: Is this true {1,2,4,3,3} = {2,4,4,3,1,1} ? Yes!

$\{1, 2, 4, 3\}$ $\{2, 4, 3, 1\}$

remember, order does not matter!

Lists are different from sets but set builder notation is similar to list comprehension in Haskell

For LISTS ORDER MATTERS

$[1,2,4,3,3] \neq [2,4,4,3,1,1]$

or $\neq [1,2,4,3]$