

# 1 | Set Notation & Venn Diagrams

## ----- Set Notation -----

A set is a collection of elements.

**For example: a set of factors for 16.**

It is denoted as  $\{ \dots \}$

**For example: the factors of 16 are  $= \{1, 2, 4, 8, 16\}$**

The universal set (the set of everything) is denoted as  $\mathcal{E}$

**For example: All factors of 30  $= \mathcal{E} = \{1, 2, 3, 5, 6, 10, 15, 30\}$**

$\mathcal{E}$  can be denoted as  $U$ , as well.

$\emptyset$  is the empty set, a set with no elements.

Upper-case letters ( $A, B, C, \dots$ ) are the sets. Lower case letters ( $a, b, c, \dots$ ) are elements.

**$n(A)$  = number of elements in  $A$**

$a \in A$  means  $a$  is an element of  $A$

**$x \in \{1, 4, 5\} = x$  can be either 1, 4 or 5**

$A \subseteq B$  means  $A$  is a subset of  $B$ , or every element in Set  $A$  is present in Set  $B$ .

**$\{\text{number of ice cream sold in an ice cream shop}\} \subseteq \{\text{number of items sold in the ice cream shop}\}$**

$a \notin A$  means  $a$  is not an element of Set  $A$ .

$A \not\subseteq B$  means  $A$  is not subset to  $B$

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## ----- Venn Diagram -----

A Venn diagram is a way to illustrate all the elements within sets and any intersections.

A Venn diagram consists of:

- A rectangle to represent the universal set.
- A circle of each set.

$A \cup B$  is represented by regions that are in Set A or Set B.

$A \cap B$  is represented by regions that are in intersection with A and B as an overlap.

