Set Theory

A set is a collection of objects of the same nature

Examples:

- $A = \{0, 1, 5\}$
- $\emptyset = \{\}$
- $\mathbb{N} = \{1, 2, 3, 4, ...\}$
- $\mathbb{Z} = \{..., -3, -2, -1, 0, 1, 2, 3, ...\}$

Notation: $x \in A$ means "x is an element of A"
Ex:

- $3 \in \mathbb{N}$
- $-4 \notin \mathbb{N}$
- $x \notin \emptyset$ (no matter what x is)

> All set above were defined by extension, which means, by listing their individual elements. But this is not always a good method...

Ex:
$\mathbb{Q} = \{0, \frac{1}{2}, \frac{2}{3}, \frac{-42}{11}, ...\}$ *What's the pattern?*

We can also define sets by comprehension , i.e. by restricting a larger set to its elements with a certain property