

Start Learning Sets - Part 2

$\boxed{1}$ is an even number false logical statement

$\boxed{1}$ is an animal false logical statement

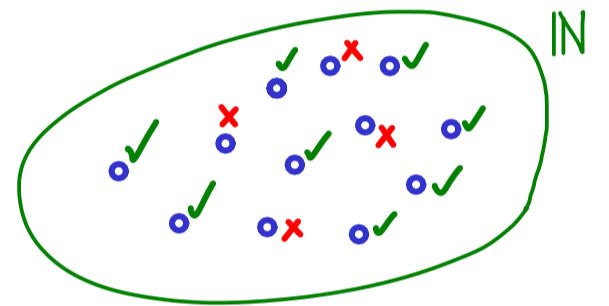
$\boxed{1} + 8 = 9$ true logical statement

predicates

Predicate: An expression with undetermined variables that ascribes a property to objects filled in for the variables.

Form new sets:

$$\left\{ x \in \mathbb{N} \mid x \text{ is an even number} \right\}$$



$$\left\{ y \in \mathbb{Z} \mid y \in \mathbb{N} \right\}$$

For $A := \{ \text{Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune} \}$

form: $\{ p \in A \mid p \text{ has at least 1 confirmed moon} \}$

Quantifiers:

$\forall x$ for all x $\exists x$ it exists x

Predicate: x is a planet

$\forall x : x \text{ is a planet}$ \rightsquigarrow logical statement
false

$\exists x : x \text{ is a planet}$ \rightsquigarrow logical statement
true

Equality for sets: Two sets A, B are the same, written as $A = B$ if

$$\forall x : x \in A \leftrightarrow x \in B \quad \text{is true.}$$

Example: $C := \{2, 3, 5\} = \{3, 5, 2\} =: D$

$1 \in C$	\leftrightarrow	$1 \in D$	true
$2 \in C$	\leftrightarrow	$2 \in D$	true
		\vdots	

$$\{2, 3, 5\} = \{2, 2, 2, 3, 3, 5\}$$

Subsets: For two sets A, B , we write $A \subseteq B$ if

$$\forall x : x \in A \rightarrow x \in B \quad \text{is true.}$$

short notation: $\forall x \in A : x \in B$

We call A a subset of B . (We can also write $B \supseteq A$)

