

1 2.1 - Sets

Sets are groups of objects, often Numbers. Objects in sets usually have something in common, as otherwise a set would be nonsensical.

1.1 Common Sets

1. The set of all Complex numbers - \mathbb{C} ($\backslash\mathrm{mathbb{C}}$)
2. The set of all Real numbers - \mathbb{R} ($\backslash\mathrm{mathbb{R}}$)
3. The set of all Rational numbers - \mathbb{Q} ($\backslash\mathrm{mathbb{Q}}$)
4. The set of all Integer numbers - \mathbb{Z} ($\backslash\mathrm{mathbb{Z}}$)
5. The set of all Natural numbers - \mathbb{N} ($\backslash\mathrm{mathbb{N}}$)
6. The set of all Imaginary numbers - \mathbb{I} ($\backslash\mathrm{mathbb{I}}$)
7. The empty Set - \emptyset or $\{\}$ ($\backslash\mathrm{emptyset}$ or $\backslash\{\}$)

$$\mathbb{N} \subset \mathbb{Z} \subset \mathbb{Q} \subset \mathbb{R} \subset \mathbb{C}$$

$$\mathbb{I} \subset \mathbb{C}$$

$$\mathbb{I} \ni x \notin \mathbb{R}$$

$$\mathbb{R} \ni x \notin \mathbb{I}$$

1.2 Subsets

The set A is a *subset* of B iff B contains **all** objects of A . A being a subset of B can also be expressed as B is a *superset* of A . Subsets are written as \subset ($\backslash\mathrm{subset}$) in equations.

1.3 Size of a Set

$|S|$ denotes the size, or number of *distinct*¹ objects in set S . Size is also called the *Cardinality* of a **finite** set.

1.4 Power Sets

A Power Set is one that includes all subsets of another set. Power Sets are denoted by $\mathcal{P}(S)$ ($\backslash\mathrm{mathcal{P}}(S)$) in equations.

1.5 Ordered n-tuple

An ordered n-tuple is an ordered collection denoted by (a_1, a_2, \dots) ((a_1, a_2, \dots)) Ordered tuples are equal if they have the same elements at the same locations.

¹Distinct objects means that equivalent objects are only counted once, e.g. $|2, 2| = 1$ as 2 is only counted once