

Set Theory Symbols Reference

Use this reference to read and write set notation.



Sets

A set is a well-defined collection of distinct objects.

$$A = \{1, 2, 3\}$$



Superset

Contains every element of the other set.

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



Union

Contains everything in either set or both.

$$A=\{1,2\}; B=\{2,3\}; \{1,2,3\}$$



Proper superset

Contains the other set and at least one extra element.

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



Intersection

Contains everything common to the sets.

$$A=\{1,2\}; B=\{2,3\}; \{2\}$$



Not a superset

Misses at least one element of the other set.

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



Subset

Every element of the first set is in the second.

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



Power set

Contains every subset, including the empty and whole sets.

$$P(\{a,b\}) = \{\{\}, \{a\}, \{b\}, \{a,b\}\}$$



Proper subset

A subset that is not equal to the containing set.

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



Equal sets

Contain exactly the same elements.

$$\{1,2\} = \{2,1\}$$



Not a subset

At least one element of the first set is absent from the second.

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



Complement

Elements of U outside the named set; also written U difference A.

$$U=\{1,2,3\}; A=\{1,2\}; \{3\}$$

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Difference

Elements in the first set but not the second.

$A=\{1,2\}; B=\{2,3\}; \{1\}$



Positive natural numbers

Under this convention, natural numbers begin at one.

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



Symmetric difference

Elements in exactly one of the two sets.

$A=\{1,2\}; B=\{2,3\}; \{1,3\}$



Natural numbers including zero

Some texts include zero; always state the convention.

$\{0,1,2,3,\dots\}$



Membership

The object belongs to the set.

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



Integers

Whole numbers and their negatives.

$\{\dots,-2,-1,0,1,2,\dots\}$



Nonmembership

The object does not belong to the set.

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



Rational numbers

Ratios of integers with nonzero denominator.

$3/4$



Empty set

Has no elements.

$\{\}$



Real numbers

All points on the number line.

$\text{sqrt}(2)$



Universal set

Contains every object under discussion.

$A ; U$



Complex numbers

Numbers $a + bi$, where i squared is -1 .

$2 + 3i$