Set: A set is an unordered collection of objects, e.g., students in this class; air molecules in this room.

Element: The objects in a set are called the elements, or members of the set. a ∈ A means that 'a' is an *element* of A (A is the set) .

Table of set theory symbols

Symbol	Symbol Name	Meaning / definition	Example
{ }	set	a collection of elements	A = {3,7,9,14}, B = {9,14,28}
|	such that	so that	A = {x | x∈$\mathbb{R}$, x<0}
A∩B	intersection	objects that belong to set A and set B	A ∩ B = {9,14}
A∪B	union	objects that belong to set A or set B	A ∪ B = {3,7,9,14,28}
A⊆B	subset	A is a subset of B. set A is included in set B.	{9,14,28} ⊆ {9,14,28}
A⊂B	proper subset / strict subset	A is a subset of B, but A is not equal to B.	{9,14} ⊂ {9,14,28}
A⊄B	not subset	set A is not a subset of set B	{9,66} ⊄ {9,14,28}
A⊇B	superset	A is a superset of B. set A includes set B	{9,14,28} ⊇ {9,14,28}
A⊃B	proper superset / strict superset	A is a superset of B, but B is not equal to A.	{9,14,28} ⊃ {9,14}
A⊅B	not superset	set A is not a superset of set B	{9,14,28} ⊅ {9,66}
2^A	power set	all subsets of A	
$\mathcal{P}(A)$	power set	all subsets of A	
A=B	equality	both sets have the same members	A={3,9,14}, B={3,9,14}, A=B
A^c	complement	all the objects that do not belong to set A	
A\B	relative complement	objects that belong to A and not to B	A = {3,9,14}, B = {1,2,3}, A \ B = {9,14}
A-B	relative complement	objects that belong to A and not to B	A = {3,9,14}, B = {1,2,3}, A - B = {9,14}

Symbol	Symbol Name	Meaning / definition	Example
A∆B	symmetric difference	objects that belong to A or B but not to their intersection	A = {3,9,14}, B = {1,2,3}, A ∆ B = {1,2,9,14}
A⊖B	symmetric difference	objects that belong to A or B but not to their intersection	A = {3,9,14}, B = {1,2,3}, A ⊖ B = {1,2,9,14}
a∈A	element of	set membership	A={3,9,14}, 3 ∈ A
x∉A	not element of	no set membership	A={3,9,14}, 1 ∉ A
(a,b)	ordered pair	collection of 2 elements	
A×B	cartesian product	set of all ordered pairs from A and B	
|A|	cardinality	the number of elements of set A	A={3,9,14}, |A|=3
#A	cardinality	the number of elements of set A	A={3,9,14}, #A=3
$\aleph_0$	aleph-null	infinite cardinality of natural numbers set	
$\aleph_1$	aleph-one	cardinality of countable ordinal numbers set	
Ø	empty set	Ø = { }	A = Ø
$\mathbb{U}$	universal set	set of all possible values	
$\mathbb{N}_0$	natural numbers / whole numbers set (with zero)	$\mathbb{N}_0$ = {0,1,2,3,4,...}	0 ∈ $\mathbb{N}_0$
$\mathbb{N}_1$	natural numbers / whole numbers set (without zero)	$\mathbb{N}_1$ = {1,2,3,4,5,...}	6 ∈ $\mathbb{N}_1$
$\mathbb{Z}$	integer numbers set	$\mathbb{Z}$= {...-3,-2,-1,0,1,2,3,...}	-6 ∈ $\mathbb{Z}$
$\mathbb{Q}$	rational numbers set	$\mathbb{Q} = \{x \mid x=a/b, a,b\in\mathbb{Z}\}$	2/6 ∈ $\mathbb{Q}$
$\mathbb{R}$	real numbers set	$\mathbb{R} = \{x \mid -\infty < x < \infty\}$	6.343434 ∈ $\mathbb{R}$
$\mathbb{C}$	complex numbers set	$\mathbb{C} = \{z \mid z=a+bi, -\infty<a<\infty, -\infty<b<\infty\}$	6+2i ∈ $\mathbb{C}$

Some Important Sets

B = Boolean values = {true,false}
N = natural numbers ={0,1,2,3….. }
Z = integers = {….,-3,-2,-1,0,1,2,3,4…..}
Z_+ = positive integers = {1,2,3,…..}
R = set of real numbers
$R_+ = R_{>0}$ = set of positive real numbers
C = set of complex numbers
Q = set of rational numbers