Mathematics Set Theory Symbols

Let us see the different types of symbols used in Mathematics set theory with their meanings and examples. Consider a Universal set (U) = {1, 2, 7, 9, 13, 15, 21, 23, 28, 30}

Symbol	Symbol Name	Meaning	Example
{ }	set	a collection of elements	A = {1, 7, 9, 13, 15, 23}, B = {7, 13, 15, 21}
A ∪ B	union	Elements that belong to set A or set B	A ∪ B = {1, 7, 9, 13, 15, 21, 23}
A ∩ B	intersection	Elements that belong to both the sets, A and B	A ∩ B = {7, 13, 15 }
A ⊆ B	subset	subset has few or all elements equal to the set	{7, 15} ⊆ {7, 13, 15, 21}
A ⊄ B	not subset	left set is not a subset of right set	{1, 23} ⊄ B
A ⊂ B	proper subset / strict subset	subset has fewer elements than the set	{7, 13, 15} ⊂ {1, 7, 9, 13, 15, 23}
A ⊃ B	proper superset / strict superset	set A has more elements than set B	{1, 7, 9, 13, 15, 23} ⊃ {7, 13, 15, }
A ⊇ B	superset	set A has more elements or equal to the set B	{1, 7, 9, 13, 15, 23} ⊇ {7, 13, 15, 23}
Ø	empty set	Ø = { }	C = {Ø}
P (C)	power set	all subsets of C	C = {4,7}, P(C) = {{}, {4}, {7}, {4,7}} Given by 2^s, s is number of elements in set C
A ⊅ B	not superset	set X is not a superset of set Y	{1, 2, 5} ⊅{1, 6}
A = B	equality	both sets have the same members	{7, 13,15} = {7, 13, 15}

A \ B or A-B	relative complement	objects that belong to A and not to B	{1, 9, 23}
A^c	complement	all the objects that do not belong to set A	We know, U = {1, 2, 7, 9, 13, 15, 21, 23, 28, 30} A^c = {2, 21, 28, 30}
A ∆ B	symmetric difference	objects that belong to A or B but not to their intersection	A ∆ B = {1, 9, 21, 23}
a ∈ B	element of	set membership	B = {7, 13, 15, 21}, 13 ∈ B
(a, b)	ordered pair	collection of 2 elements	(1, 2)
x ∉ A	not element of	no set membership	A = {1, 7, 8, 13, 15, 23}, 5 ∉ A
|B|	cardinality	the number of elements of set B	B = {7, 13, 15, 21}, |B|= 4
A × B	cartesian product	set of all ordered pairs from A and B	{3,5} × {7,8} = {(3,7), (3,8), (5,7), (5, 8)}
N_1	natural numbers / whole numbers set (without zero)	N_1 = {1, 2, 3, 4, 5,…}	6 ∈ N_1
N_0	natural numbers / whole numbers set (with zero)	N_0 = {0, 1, 2, 3, 4,…}	0 ∈ N_0
Q	rational numbers set	Q= {x | x=a/b, a, b ∈ Z}	2/6 ∈ Q
Z	integer numbers set	Z= {…-3, -2, -1, 0, 1, 2, 3,…}	-6 ∈ Z
C	complex numbers set	C= {z | z = a + bi, -∞<a<∞, -∞<b<∞}	6 + 2*i* ∈ C
R	real numbers set	R= {x | -∞ < x <∞}	6.343434 ∈ R