Set Theory Symbols and Definitions

Symbol	Name	Definition	Example
$\{\ \}$	Set	A collection of elements	A = {2,7,8,9,15,23,35}
$A \cap B$	Intersection	Objects that belong to set A and set B	If set A = {1,2,3} & set B = {2,3,4} then $A \cap B$ = {2,3}
$A \cup B$	Union	Objects that belong to set A or set B	If set A = {1,2,3} & set B = {4,5,6} then $A \cup B$ = {1,2,3,4,5,6}
$A \subseteq B$	Subset	Set A is a subset of set B if and only if every element of set A is in set B.	If set A = {a,b,c} & set B = {a,b,c} then $A \subseteq B$.
$A \subset B$	Proper Subset	Set A is a proper subset of set B if and only if every element in set A is also in set B, and there exists at least one element in set B that is not in set A.	If set A = {a,b} & set B = {a,b,c,d} then $A \subset B$.
$A \not\subset B$	Not Subset	Subset A does not have any matching elements of set B.	If set A = {a,b} & set B = {c,d,e,f} then $A \not\subset B$.
$A \supseteq B$	Superset	Set A is a superset of set B if set A contains all of the elements of set B.	If set A = {d,e,f} & set B = {d,e,f} then $A \supseteq B$.
$A \supset B$	Proper Superset	Set A is a proper superset of set B if set A contains all of the elements of set B, and there exists at least one element in set A that is not in set B.	If set A = {4,5,6} & set B = {5,6} then $A \supset B$.
$A \not\supset B$	Not Superset	Set A is not a superset of set B if set A does not contains all of the elements of set B.	If set A = {a,f,c,d} & set B = {b,f} then $A \not\supset B$.
$\mathcal{P}(A)$	Power Set	Power set is the set of all subsets of A, including the empty set and set A itself.	If set A = {1,2,3} then $\mathcal{P}(A)$ = { }, {1}, {2}, {3}, {1,2), {1,3), {1,2,3)
$A = B$	Equality	Set A & set B contain the same elements.	If set A = {2,3,4} & set B = {2,3,4} then $A = B$.

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A^c or A'	Complement	All objects that do not belong to set A.	
$A - B$	Relative Complement	Elements of set A but not set B	If set A = {a,b,c} & set B = {c,d,e} then $A - B$ = {a,b}
$A \Delta B$	Symmetric Difference	Elements that belong to set A or set B but not to their intersection.	If set A = {a,b,c} & set B = {c,d,e} then $A \Delta B$ = {a,b,d,e}
$a \in A$	Element of	Membership of set A.	If set A = {a,b,e,f,g,h} then $a \in A$
$x \notin A$	Not an Element of	Not a member of set A.	If set A = {a,b,e,f,g,h} then $x \notin A$
$\varnothing$	Null or Empty Set	The set does not contain any elements.	if set A = { } then A = $\varnothing$
U	Universal Set	The set of all possible elements.	If set A = {1,2,3}, set B = {4,5,6} & set C = {7,8} then U = {1,2,3,4,5,6,7,8}
$\mathbb{N}_0$	Set of Natural Numbers with Zero	$\mathbb{N}_0$ = {0,1,2,3,4,5,6,7,8, ...}	$0 \in \mathbb{N}_0$
$\mathbb{N}_1$	Set of Natural Numbers without Zero	$\mathbb{N}_1$ = {1,2,3,4,5,6,7,8, ...}	$7 \in \mathbb{N}_1$
$\mathbb{Z}$	Set of Integer Numbers	$\mathbb{Z}$ = {... -4,-3,-2,-1,0,1,2,3,4, ...}	$-2 \in \mathbb{Z}$
$\mathbb{Q}$	Set of Rational Numbers	A rational number is a number that can be expressed as a fraction where p and q are integers and q does not equal zero.	$\frac{2}{3} \in \mathbb{Q}$
$\mathbb{R}$	Set of Real Numbers	$\mathbb{R} = \{x \mid -\infty < x < \infty\}$	$4.862 \in \mathbb{R}$
$\mathbb{C}$	Set of Complex Numbers	$\mathbb{C} = \{ z \mid z = a + bi, -\infty<a<\infty, -\infty<b<\infty \}$	$5 + 3i \in \mathbb{C}$