

## 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 $A \subset B$ .
$A \not\subseteq B$	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 $A \not\subseteq B$ .
$A \supseteq B$	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 $A \supset B$ .
$A \not\supseteq B$	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 $A \not\supseteq B$ .
$\mathcal{P}(A)$	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 $A = B$ .



## Set Theory Symbols and Definitions

Symbol	Name	Definition	Example
$A^c$ 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 $x \notin A$
$\emptyset$	Null or Empty Set	The set does not contain any elements.	if set $A = \{ \}$ then $A = \emptyset$
$U$	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	$\mathbb{N}_0 = \{0,1,2,3,4,5,6,7,8, \dots\}$	$0 \in \mathbb{N}_0$
$\mathbb{N}_1$	Set of Natural Numbers without Zero	$\mathbb{N}_1 = \{1,2,3,4,5,6,7,8, \dots\}$	$7 \in \mathbb{N}_1$
$\mathbb{Z}$	Set of Integer Numbers	$\mathbb{Z} = \{\dots -4,-3,-2,-1,0,1,2,3,4, \dots\}$	$-2 \in \mathbb{Z}$
$\mathbb{Q}$	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	$\mathbb{C} = \{z \mid z = a + bi, -\infty < a < \infty, -\infty < b < \infty\}$	$5 + 3i \in \mathbb{C}$

