

LaTeX and Discrete Math Cheatsheet

Special Sets

- \emptyset – The empty or aka null. `\emptyset`.
- \mathbb{U} – The universe set. The set will all the elements. `\mathbb{U}`
- \mathbb{N} – The set of natural numbers. $\mathbb{N} = \{0, 1, 2, \dots\}$. `\mathbb{N}`
- \mathbb{Z} – The set of integers. Positives. $\mathbb{Z}^+ = \{1, 2, 3, \dots\}$; Negatives $\mathbb{Z}^- = \{\dots, -3, -2, -1\}$. `\mathbb{Z}`
- \mathbb{Q} – The set of rational numbers. (a number that can be express as the ratio of two integers). `\mathbb{Q}`
- \mathbb{R} – The set of real numbers. Combining the set of rational numbers and the set of irrational numbers. `\mathbb{R}`
- $\mathcal{P}(A)$ – The power set of any set A is the set of all subsets of A. `\mathcal{P}`

Set Theory Notation

- $\{, \}$ – To enclose the elements of the set.
- $:$ – "such that"; For example $\{x : x > 2\}$ reads as, for x such that x is greater than two.
- \in – An element of; $2 \in \{1, 2, 3\}$ asserts that 2 is an element of the set $\{1, 2, 3\}$. `\in`
- \notin – Is not an element of; $4 \notin \{1, 2, 3\}$ asserts that 4 is not an element of the set $\{1, 2, 3\}$. `\notin`
- \subseteq – Is a subset of; $A \subseteq B$ asserts that every element in A is an element in B. `\subseteq`
- \subset – Is a proper subset of; $A \subset B$ asserts that every element in A is an element in B but $A \neq B$. `\subset`

- \cap – **Intersection** ("and", "both true"); $A \cap B$ is the intersection of A and B. `\cap`
- \cup – **Union** ("or"); $A \cup B$ says we have a union of A and B. `\cup`
- \times – **Cartesian Product**; For $A = \{1, 2\}$ and $B = \{3, 2\}$, we'll have $A \times B$ as $\{1, 3\}, \{1, 2\}, \{2, 3\}, \{2, 2\}$. `\times`
- \setminus – **Set-minus**; $A \setminus B$ says that we have set with all elements of A minus B. `\setminus`
- \overline{A} – **The complement set of A**; a set of every element which is not in set A. `\overline{A}`
- $|A|$ – **Cardinality** (size) of A; The number of elements in the set A. `\in`

Logical Connectives

- \wedge – **Conjunction**. Similar as "and". `\wedge`
- \vee – **Disjunction**. Similar as "or". `\vee`
- \Rightarrow – **Implication**. Similar as "if-then". `\Rightarrow`
- \neg – **Negation**. simply "not". `\neg`
- \iff – **Equivalent**. "If and only if".

Qualifiers

- \exists – **Existential qualifier**. Reads "there is"; $\exists x(x < 0)$ reads as "there is number x that is less than zero". `\exists`
- \forall – **Universal qualifier**. Reads "for all" or "every"; $\forall x(x > 0)$ reads as "for every number x that is more than zero". `\forall`

To use `\mathbb` notations please first add the package **amsmath** at the top of your document.