LaTeX and Discrete Math Cheatsheet

Special Sets

- $\emptyset$ – The empty or aka null. \emptyset.
- $\mathbb{U}$ – The uiniverse set. The set will all the elements. \mathbb{U}
- $\mathbb{N}$ – The set of natural numbers. $\mathbb{N} = \{.., -1, 0, 1, 2, ..\}$. \mathbb{N}
- $\mathbb{Z}$ – The set of integers. Positives. $\mathbb{Z}^+ = \{1, 2, 3, ..\}$; Negatives $\mathbb{Z}^- = \{.., -3, -2, -1\}$. \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 that 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 intersaction 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 pf every element which is not in set A. \overline
- $|A|$ – **Cardinality** (size) of A; The number of elements in the set A. $\in$

Logical Connectives

- $\wedge$ – **Conjuction**. Similar as "and". \wedge
- $\vee$ – **Discjuntion**. Similar as "or". \vee
- $\Rightarrow$ – **Implication**. Similar as "if-them". \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 **amsfonts** at the top of you document.