Comp Sci 212
Northwestern **Instructor: Shravas Rao**

Axioms

This is a non-exhaustive list of things that do not have to be proved. In the following, x, y, w, z, and a are all real numbers unless stated otherwise.

- If x is an integer and y is an integer, then $x + y$ and $x \cdot y$ are integers.
- If x is an integer and y is a non-negative integer, then x^y is an integer.
- If $x = y$, then $x + a = y + a, x \cdot a = y \cdot a$, and $x^a = y^a$.
- If $x \leq y$ and a is positive, then $x + a \leq y + a$ and $xa \leq ya$.
- If $x \leq y$ and a is negative, then $x + a \leq y + a$ and $xa \geq ya$.
- If $x \leq y$ and $w \leq z$, then $x + w \leq y + z$.
- If $x \leq y$ and $w \leq z$ and w, z, y and z are positive, then $xw \leq yz$.
- If $x \leq y$, x and y are both non-negative, and $a \geq 0$, then $x^a \leq y^a$. In particular, $y^a \geq 0$ by letting $x = 0$.
- If $x \leq y$, x and y are both non-negative, and $a \leq 0$, then $x^a \geq y^a$. In particular, $1/x \geq 1/y$ by letting
- $x \leq |x|$.
- If A and B are sets, then $a \in A \cup B$ if and only if $a \in A$ or $a \in B$.
- If A and B are sets, then $a \in A \cap B$ if and only if $a \in A$ and $a \in B$.
- If A and B are sets and $A \subseteq B$, then if $a \in A$, then $a \in B$.