Notes

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Set Theory
A set is defined by which things are its members (or elements).
To say that x is a member of the set X, we write $x \in X$,

Ways to define sets
English
"A is the set of all integers between 0 and 3 (inclusive)"

Setlist Notation
A = {0,1,2,3}
B = {0,1,2,3,...,99,100}

P = {3,4,6,8,12,14,18,20,24,30,38,...}
= the set of all #'s that are one more han a prime #
= {p + 1 | p is a prime #}

Set builder notation
$S = \{n^2 \mid n \text{ is an integer} \wedge n \geq 20 \wedge n \leq 500\}$

Special Sets of Numbers
Natural Numbers
$\mathbb{N}$ = {0,1,2,3,...}
Integers
$\mathbb{Z}$ = {...,-2,-1,0,1,2,...}
Rational Numbers
$\mathbb{Q} = \{\frac{p}{q} \mid p \in \mathbb{Z} \wedge q \in \mathbb{Z} \wedge q \neq 0\}$
= any # that can be written as a ratio/fraction/quotiant of integers

The empty set

X = {}
X = the set with no numbers
The symbol for this: $\emptyset$

Set Operations

$A \cup B = \{X \mid X \in A \vee x \in B\}$ This is called a union.
$A \cap B = \{x \mid x \in A \wedge x \in B\}$ This is called the intersection.

$= \{x \mid x \in A\}$ This is called the complement. (depends on context, or the universal set)

The universal set (or the universe) is the set of all the things we currently care about. We often use a cursive capital $\mathbb{U}$ for the universe.