Miscellaneous Material

Ryan Leal

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1 Review

1.1 Set Theory

A set is defined with elements in curly brackets

$$S = \{1, 5, a_1, a_2, \pi\}$$

And are defined with "such that" statements denoted with a colon:

$$S = \{x : 2 < x < 3, x \in \mathbb{R}\}$$

The following is a brief review of notation in set theory:

Union of sets:	$S_1 \cup S_2$
Intersection of sets:	$S_1 \cap S_2$
Subset:	$S_1 \subseteq S_2$
Strict subset:	$S_1 \subset S_2$
Element Exists In Set:	$x \in S$

The following is a brief review of notation for quantificational logic:

Logical And:	$A \wedge B$
Logical Inclusive Or:	$A \vee B$

1.2   Algebra

The parity of a number is whether or not it is even.
The sum of a set of numbers is denoted with capital Sigma:

$$a_1 + a_2 + \cdots + a_n = \sum_{i=0}^{n} a_i$$

The product is denoted with a capital Pi:

$$a_1 * a_2 * \cdots * a_n = \prod_{i=0}^{n} a_i$$

The factorial operator is denoted with an exclamation point (!). This unary operator finds the product of the integers less than or equal to the specified integer.

$$1 * 2 * \cdots * n = n!$$

Students should be familiar with the fact that if an integer is divisible by 3, the sum of it's digits is divisible by 3 as well.

1.3   Algebraic Manipulation

The sum of the counting numbers

$$1 + 2 + 3 + \cdots + n = \frac{(n)(n+1)}{2}$$

1.4   Complex Numbers

The complex numbers form a two-dimensional cartesian plane with a real axis **Re** and an imaginary axis **Im**.