

# Math115A 1/9 notes

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operation with sets

What is a set A collection of things, which we call elements of the set A, Normally denoted by lower letters a,b we write  $a \in A$  to represent that a is belong to the set A”

often describe a set A by listing its elements e.g.  $A = \{0,2,3,4\}$

$0 \in A$  but not equal to A.

another thing of writing down is by describing the elements in it in which are we write  $\{x \in \mathbb{R}(\text{all real number}) : x > 2\}$   $\{x \in \mathbb{Z}(\text{all intergers}) : x > 2\} = \{3,4,5,6,7,\dots\}$   $\mathbb{N}$  (natural number)  $= \{0,1,2,3,4,5,\dots\}$   $\mathbb{Q}$  (fractions)  $= \{m/n : m,n \in \mathbb{Z}, n \neq 0\}$   $\mathbb{C}$  (complex number)

intersection  $A_i = \{x \mid x \in A_i \text{ for all } i \in I\}$  reverse A (for all)  $i \in I$

Ex:

$$A_i = \{x \in \mathbb{Z} \mid x \geq i\}$$

(belong to both sets)  $\cap A_i = \text{empty } i \in \mathbb{Z}$

$$\cup A_i = \mathbb{Z} \quad i \in \mathbb{Z}$$

given the sets X abd A then the difference set

$$X - A = \{x \in X : x \notin A\}$$

if  $A \subset X$ , then  $X - A$  also called the complement if A in X

Theorem

that A is

$$X - (A \cup B) = (X - A) \cap (X - B)$$

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Theorem

if  $A \subset B$  then for any given set X we have,  $X - B \subset X - A$

$$\frac{1}{2} \cap$$

$\in$