23MAT112
Class Notes

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Contents

Chapter 1

Sets

1.1 Sets

Definition 1.1.1: Sets

A set is a collection of objects. e.g. - $\mathbb{N}, \mathbb{Z}, \mathbb{Q}, \mathbb{R}, \mathbb{C}$

Notations -

- $A, B \dots Z$ will denote sets
- $a, b \dots z$ will denote elements
- $a \in A$, a is an element of A
- $a \notin A$, a is not an element of A

Roster Notation

- $\mathbb{N} = 1, 2, \dots$
- $\mathbb{A} = 2, 4, 6, 8$
- $B = x \in Z^{+} | x < 10$

1.1.1 Subsets

Definition 1.1.2: Subsets

A and B are two sets. A is a subset of b, and we write $A \subset B$, if every element of A is also an element of B.

Theorem 1.1.1 (Equivalence Of Sets)**.** Two sets A and B are equal, and we write A = B, $\Leftrightarrow A \subset B$ and $B \subset A$

1.1.2 Unions

Definition 1.1.3: Unions

The union of two sets A and B denoted by $A \cup B$, is

$$A \cup B = x \mid x \in A \text{ or } x \in B$$