**Definitions**: A set is an unordered collection of elements. When A and B are sets, A = B (set equality) means

$$\forall x (x \in A \leftrightarrow x \in B)$$

When A and B are sets,  $A \subseteq B$  ("A is a **subset** of B") means

$$\forall x (x \in A \to x \in B)$$

When A and B are sets,  $A \subsetneq B$  ("A is a  $\mathbf{proper}$   $\mathbf{subset}$  of B ") means

$$(A \subseteq B) \land (A \neq B)$$