Set Theory Introduction

- A set is simply a collection of things or objects, of any kind.
- These objects are called elements or members of the set. We refer to the set as an entity in its own right and often denote it by A, B, C or D, etc.
- If A is a set and x a member of the set, then we say $x \in A$ i.e. x belongs to A. The symbol $\notin$ denotes the negation of *in* i.e. x $\notin$ A means x does not belong to A.

Set Theory Introduction

- The elements of a set, and hence the set itself, are characterised by having one or more properties that distinguish the elements of the set from those not in the set.
- For example, if C is the set of non-negative real numbers, then we might use the notation

$$C = \{x/x \text{ is a real number and} x \neq 0\}$$

- We would verbalise this as *the set of all x such that x is a real number and non-negative*.

Differences and complements

- If A and B are sets then the difference set A B is the set of all elements of A which do not belong to B.
- If B is a sub-set of A, then A B is sometimes called the complement of B in A. When A is the universal set one may simply refer to the complement of B to denote all things not in B.
- The complement of a set A is denoted as A^c or A'.