

1.1 Types of Sets and Set Notation

Terms:

Set: A collection of distinguishable objects

Element: An object in a set

Universal Set: A set of all the elements under consideration for a particular context (also called sample space)

Subset: A set whose elements all belong to another set.

Complement: All the elements of a universal set that do not belong to a subset of it.

Empty Set: A set with no elements

Disjoint Set: two or more sets with nothing in common

Finite set: a set with a countable number of elements

Infinite set: a set with an infinite number of elements

Mutually exclusive: Two or more events that cannot occur at the same time

Notation	Examples
\in means "is an element of"	$2 \in \{1,2,3,4\}$
\notin means "is not an element of"	$2 \notin \{1,3,5\}$
\cup means "union of set"	$\{1,2,3\} \cup \{3,4,8\} = \{1,2,3,4,8\}$
\cap means "intersection of set"	$\{1,2,3\} \cap \{3,4,8\} = \{3\}$
\subset means "subset of set"	$\{1,2,3\} \subset \{1,2,3,4,8\}$
\supset means "superset of set"	$\{1,2,3,4,8\} \supset \{1,2,3\}$
$\not\subset$ means "not a subset of set"	$\{10,20,30\} \not\subset \{1,2,4,8\}$
\emptyset or $\{\}$ denotes the empty set	

REMEMBER:

- You can represent a set of elements by:
 - Listing the elements, $A=\{1,2,3,4,5\}$
 - Using words or a sentence, $A=(\text{all integers greater than } 0 \text{ and less than } 6)$
 - Using set notation, $A=\{x|0 < x < 6, x \in I\}$
- You can show how sets and their subsets are related using Venn Diagrams. Venn diagrams do not usually show the relative sizes of sets
- You can often separate a universal set into subsets, in more than one correct way
- Sets are equal if they contain exactly the same elements, even if the elements are listed in different orders.
- You may not be able to count all the elements in a very large or infinite set
- The sum of the number of elements in a set and its complement is equal to the number of elements in the universal set:
 - $n(A) + n(A') = n(U)$
- when two sets A and B are disjoint:
 - $n(A \text{ or } B) = n(A) + n(B)$