

Chapter 1 : SETS

PART 1

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REFERENCE

- Refer to Chapter 1 NCERT:

<http://www.ncert.nic.in/ncerts/l/kemh101.pdf>

INTRODUCTION

- The concept of set serves as a fundamental part of the present day mathematics. Today this concept is being used in almost every branch of mathematics. Sets are used to define the concepts of relations and functions. The study of geometry, sequences, probability, etc. requires the knowledge of sets.
- In everyday life, we often speak of collections of objects of a particular kind, such as, a pack of cards, a crowd of people, a cricket team, etc. In mathematics also, we come across collections, for example, of natural numbers, points, prime numbers, etc. we will learn in this chapter about these collections.
- Watch the video : <https://youtu.be/l3-A0042Lyo>

Sets and their Representation

SET-

A set is a collection of well defined distinct elements or objects

A Set is always represented by a Capital letter and the elements are enclosed in curly brackets .

The following points may be noted :

- (i) Objects, elements and members of a set are synonymous terms.
- (ii) Sets are usually denoted by capital letters A, B, C, X, Y, Z, etc.
- (iii) The elements of a set are represented by small letters a, b, c, x, y, z, etc.
- (iv) If a is an element of a set A, we say that “ a belongs to A” the Greek symbol \in (epsilon) is used to denote the phrase ‘belongs to’. Thus, we write $a \in A$. If ‘b’ is not an element of a set A, we write $b \notin A$ and read “b does not belong to A”

There are two ways in which a set can be represented -

- a) ROSTER form/ LIST form
- b) SET Builder form/RULE form

Watch these videos -

<https://youtu.be/hEgH4Xfgefo>

<https://youtu.be/y-Dg4sWVlgs>

Representation of a Set

- **Roster form or List form-**

The elements in this form are separated by commas and are enclosed by a pair of curly brackets.

Eg. $A = \{1, 2, 3, 4, 5, 6, 7\}$

- **Set builder form or Rule form-**

It is a representation of elements followed by a rule or property

Eg. $A = \{x : x \in \mathbb{N}, 1 \leq x \leq 7\}$

- Please watch this video –

<https://youtu.be/JsMTPYD7Oj4>

Examples of Sets used in Mathematics

- N : Natural numbers
- W : whole numbers
- I/Z : Integers
- I^+ : Positive integers
- I^- : Negative integers
- Q : Rational numbers
- Q^+ : Positive Rational numbers
- Q^- : Negative Rational numbers
- R : Real numbers
- R^+ : Positive Real numbers
- R^- : Negative Real numbers
- C : Complex numbers

TASK

- Do exercise 1.1 NCERT and its examples

Order of a Set

- **Order / Size/ Cardinal number of a Set** – Order of a set is the number of elements present in a set.
- Eg. $A = \{2,4,1,5\}$ $n(A) = 4$; where $n(A)$ represents the order of the set.
- Depending on the order of a set , it can divided into two categories -
 - ❖ **Finite Set**- set in which the number of elements are countable
Eg: $A = \{2,4,5\}$
 - ❖ **Infinite Set**- set in which the number of elements are uncountable.
Eg. set of natural numbers, whole numbers
- Watch this videos – <https://youtu.be/BydchiZ8t6o>
- <https://youtu.be/Voj2N0VVbmg>

TYPES OF SETS

- **Empty/Null/Void set:** This set contains no element . It is represented by $\{\}$ or ϕ
- **Singleton set :** A set which contains only one element.
- **Equal sets :** Two sets are said to be equal sets if there order and elements are same.

Eg: $A=\{3,7,9\}$ $B=\{7,3,9\}$ Therefore $A \approx B$

- **Equivalence sets :** Two sets whose order are same are said to be equivalence sets. Eg $A=\{2,4,6\}$ $B=\{2,9,10\}$

As $n(A)= 3$ and $n(B) =3$ Therefore A and B are equivalence sets

- Watch this video – https://youtu.be/N_fZwQjsZvs

TASK

- Do exercise 1.2 NCERT and its examples