Mathematics worksheets: Sets

Set Theory
A collection of members/objects satisfying some fixed criteria is called set.
For example, a collection of names of all the rivers of India.

A= {Ganga, Yamuna, Kaveri, Sabarmati, Krishna, Brahmaputra, .........................}

Set: A set is a well defined collection of objects.

Enjoy making the following sets

a. Set of all the colours that the letters in your name can spell. (A)

b. Set of all the letters in your name. (B)

c. Set of all the letters in your father’s name. (C)

d. Set of all the letters in your mother’s name. (D)

e. Set of all the letters that are common in Sets A, B, C & D.
Empty Set:-

A set that does not contain any member/element is called an empty set. For example, a set of persons in the world, who are more than 200 years old.

An empty set is denoted as $\emptyset$ or \{ \}

Can you think of five empty sets in the context of your home and locality?

1.
2.
3.
4.
5.

Finite & Infinite Sets:

Let me explain the word finite & infinite. Finite stands for fixed/countable numbers like the number of members in your family, number of teachers in your school, number of families in your colony, etc.

Can you think of 5 such examples, where the numbers are fixed/countable?

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We use the word “infinite” when numbers are very large/uncountable. For example, the number of stars in the universe, number of drops of water in the ocean, etc.

Write down 5 such examples where numbers are very large/uncountable.

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A set consisting of a definite number of members (elements) is called a finite set. For example, a set of letters in INDIA

S= \{I,N,D,I,A\}

Make 3 finite sets & 3 infinite sets

<table>
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<tr>
<th>Finite Sets</th>
<th>Infinite Sets</th>
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<tbody>
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<td>1.</td>
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**Debate:** Empty sets are infinite sets (please write your comment in the space given below)

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**Equal Sets:** Two sets (X & Y) are called equal sets if they have exactly the same members/elements and we write them as X=Y

Answer the following:

1. With reference to the set X & Y: X\#Y, what does it mean?
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2. If X is set of letters in “ALLOY” and Y is set of letters in “LOYAL”, make both the sets in set builder form and write whether they are equal sets.

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3. Write three examples of equal sets.

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Subsets:

• Imagine a set (I) consisting of all the states of India and another set consisting of all the north Indian states (N)

  (North Indian States)

As you can see ‘N’ belonging to ‘I’ ie, N is a subset of I
• Make a set (X) of names of all the members of your family.

\[ X = \{ \} \]

Now make a set (Y) of all the children in your family.

\[ Y = \{ \} \]

Can you see some relationship in set X & Y? Observe that all the members of the set Y are members of set X, i.e., Set Y belongs to Set X. Mathematically it is written as \( Y \subseteq X \). Set Y is said to be a subset of X if every member of Y is also a member of X.

Write five such examples of subsets in the set builder form

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To elaborate it further if \( S, W, N, E \) are the sets of the south Indian, west Indian, north Indian, and east Indian states, we can say

\[ I = (S, E, W, N) \]