SESSION 2020-21 CLASS 11 MATHS
CHAPTER 1 SETS
REVISION

By Mathematics Department

BBPS,Pitampura

Let's Recall

- Set and their representations: A set is a well-defined collection of objects. There are two methods of representing a set (i) Roaster or tabular form , (ii) Set builder form
- The empty set A set which does not contain any element is called the empty set or the void set or null set and is denoted by { } or ϕ.
- Finite and infinite sets A set which consists of a finite number of elements is called a finite set otherwise, the set is called an infinite set.
- Subsets A set A is said to be a subset of set B if every element of A is also an element of B. In symbols we write $A \subset B$ if $a \in A \Rightarrow a \in B$.
- Equal sets Given two sets A and B, if every elements of A is also an element of B and if every element of B is also an element of A, then the sets A and B are said to be equal. The two equal sets will have exactly the same elements.

- **Intervals as subsets of R**

Let a, b ∈ R and a < b. Then

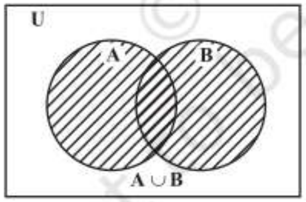
(a) An open interval denoted by (a, b) is the set of real numbers {x : a < x < b}

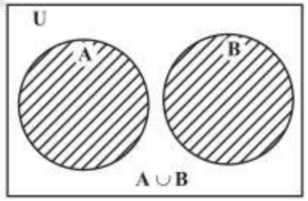
(b) A closed interval denoted by [a, b] is the set of real numbers {x : a ≤ x ≤ b)

(c) Intervals closed at one end and open at the other are given by [a, b) = {x : a ≤ x < b} or (a, b] = {x : a < x ≤ b}

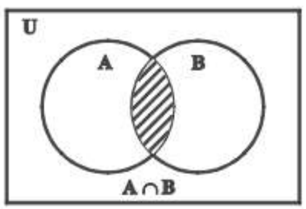
- **Power set : The collection of all subsets of a set A is called the power set of A. It is denoted by P(A). If the number of elements in A = n , i.e., n(A) = n, then the number of elements in P(A) = 2^n .**
- **Universal set This is a basic set; in a particular context whose elements and subsets are relevant to that particular context. For example, for the set of vowels in English alphabet, the universal set can be the set of all alphabets in English. Universal set is denoted by U.**

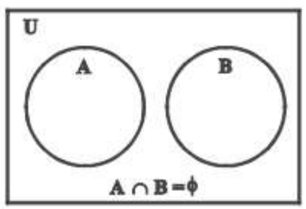
- Union of Sets : The union of any two given sets A and B is the set C which consists of all those elements which are either in A or in B. In symbols, we write $C = A \cup B = \{x \mid x \in A \text{ or } x \in B\}$





- Intersection of sets: The intersection of two sets A and B is the set which consists of all those elements which belong to both A and B. Symbolically, we write $A \cap B = \{x : x \in A \text{ and } x \in B\}$.





- Difference of sets The difference of two sets A and B, denoted by

A – B is defined as set of elements which belong to A but not to B. We write $A - B = \{x : x \in A \text{ and } x \notin B\}$ also, $B - A = \{ x : x \in B \text{ and } x \notin A\}$

Try these

1. State which of the following statements are true and which are false. Justify your answer.

(i) $37 \notin \{x \mid x$ has exactly two positive factors$\}$

(ii) $28 \in \{y \mid$ the sum of the all positive factors of y is $2y\}$

(iii) $7{,}747 \in \{t \mid t$ is a multiple of $37\}$

2. Write the following sets in the roaster from

(i) $A = \{x : x \in R, 2x + 11 = 15\}$

(ii) $B = \{x \mid x\ 2 = x, x \in R\}$

(iii) $C = \{x \mid x$ is a positive factor of a prime number $p\}$

3. Let $S = \{x \mid x$ is a positive multiple of 3 less than $100\}$,

$P = \{x \mid x$ is a prime number less than $20\}$. Then find $n(S) + n(P)$.

4. When $A = \phi$, then number of elements in $P(A)$ is ________________.

5. If A and B are finite sets such that $A \subset B$, then $n(A \cup B) =$ ________________.

6. Power set of the set $A = \{1, 2\}$ is _______________.

7. Given $A = \{0, 1, 2\}$, $B = \{x \in R \mid 0 \leq x \leq 2\}$. Then is $A = B$?

8. Given that $M = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ and if

$B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, then is $B \not\subset M$?

9. Let $A = \{x : x$ is a natural number and a factor of $18\}$ and

$B = \{x : x$ is a natural number and less than $6\}$. Find $A \cup B$.

10. Let $X = \{1, 2, 3, 4\}$, $Y = \{2, 3, 5\}$ and $Z = \{4, 5, 6\}$. Verify

$(X \cup Y) \cup Z = X \cup (Y \cup Z)$

11. If $P = \{a, b, c\}$ and $Q = \{b, c, d\}$; then is $P \cap Q = \{b, c\}$?

12. Do Two disjoint sets have atleast one element in common?