Revision Notes

Class - 10 Maths

Chapter 5 - Arithmetic Progression

WWW.SARKARIPUR.COM

Definition of Arithmetic Progression

● An arithmetic progression is a sequence of numbers, obtained by adding a fixed number to the preceding term starting from the first term such that the difference between each consecutive term remains the same.

● Each of the numbers in the list is called a term and the fixed number is called the common difference of the AP which can be any integer.

For example: 2,5,8,11.... having common difference of 3.

General term of an AP

1. The general form of an AP is:

a ,a + d ,a + 2d ,a + 3d ,....,a + (n-1)d

2. An AP with finite number of terms is called a finite AP having a + (n - 1)d as the last term. An AP which neither has a finite number of terms nor has a last term is called an infinite AP.

For example:

a) Finite AP: 1,3,5,7,....,25

b) Infinite AP: 2,4,6,8.....∞

3. The n^{th} term of the AP: $a_n = a + (n - 1)d$, where a is the first term of the sequence and d is the common difference.

The Second term: $a_2 = a+(2-1)d = a+d$

Similarly, the third term $a_3 = a+ (3-1)d = a+2d$

The fourth term $a_4 = a + (4-1)d = a+3d$ and so on till the last term.

Example 1:

An AP has a first term 3 , common difference 4 . Find the third and fifth term of the AP.

Solution:

$a = 3, d = 4$

$a_3 = 3 + (3-1)4$

$a_3 = 11$

4. n^{th} term of an AP from the end: $t_n = L - (n - 1)d$, where L is the last term of the AP.

Example 2:

An AP has a common difference 2 and last term 24 . Find the fourth term of the AP from the end.

Solution:

$d = 2, L = 24$

$t_4 = 24 - (4 - 1)2$

Sum of the terms of an AP

1. Sum of n terms of an AP if first term and common difference is given:

$S = \frac{n}{2}(2a + (n - 1)d)$

2. Sum of n terms of an AP if first term and last term l is given:

$S = \frac{n}{2}(a + 1)$

Example 3:

Find the sum of first 10 terms of the AP 1,4,7,10.....34.

Solution:

$S = \frac{10}{2}(2x1 + (10 - 1)3)$

$= 5(2+27)$

$= 5 \times 29$

$= 145$

WWW.SARKARIPUR.COM