

Arithmetic progressions - Points to Remember

1. Arithmetic Progressions (A.P.):

A sequence a1, a2, a3, ..., an, ... is called an arithmetic progression if there exists a constant d such that a2-a1=d, a3-a2=d, a4-a3=d, ..., an+1-an=d and so on. The constant d is called the common difference.

2. General Terms of an Arithmetic Progression:

If a is the first term and d the common difference of an A.P., then the A.P. is a, a+d, a+2d, a+3d, a+4d, ...

3. Properties of an Arithmetic Progression:

(i) A sequence a1, a2, a3, ..., an, ... is an A.P., if ar+1-ar is independent of r.

(ii) A sequence a1, a2, a3, ..., an, ... is an A.P., if and only if its nth term an is a linear expression in n, and in such a case the coefficient of n is a common difference.

4. nth Term of an Arithmetic progression:

(i) n^{th} term an of an A.P. with the first term a and common difference d is given by an=a+(n-1)d.

(ii) n^{th} term from the end = Last term +(n-1)(-d)=l-(n-1)d, where l denotes the last term.

5. Various Terms in an AP can be Chosen in the Following Manner:

	Number of terms	Terms	Common difference
	3	a-d, a, a+d	d
\geq	4	a-3d, a-d, a+d, a+3d	2d
\geq	5	a-2d, a-d, a, a+d, a+2d	d
	6	a-5d, a-3d, a-d, a+d, a+3d, a+5d	2d

6. Sum of First n Terms:

The sum of n terms of an A.P. with the first term a and the common difference d is given by Sn=n22a+n-1d

Also, Sn=n2a+l, where l= Last term =a+n-1d

7. Properties of Sum of n Terms:

If the ratio of the sums of n terms of two A.P.'s is given, then to find the ratio of their nth terms, we replace n by (2n-1) in the ratio of the sums of n terms.

A sequence is an A.P. if and only if the sum of its n terms is of the form An2+Bn, where A, B are constants. In such a case the common difference is 2A.