

APTITUDE - PROGRESSION

Advertisements

Sequence

A succession of numbers formed and arranged in a definite order according to a certain definite rule is called a sequence.

Arithmetic Progression (A.P.)

It is a sequence in which each term, except the first one differs the preceding term by a constant. This constant is called the common difference. We denote the first term by a , common difference by d , n th term by T_n and the sum of first n terms by S_n .

Examples

5, 8, 11, 14, 17... is an A.P. in which $a=5$ and $d = (8-5) = 3$.
8, 5, 2, -1, -4, -7... is an A.P. in which $a = 8$ and $d = (5-8) = -3$.

General Term of an A.P.

In a given A.P., let first term = a , common difference = d . Then,

$T_n = a + (n-1) d$.
Sum of n terms of an A.P.
 $S_n = n/2 [2a + (n-1) d]$
 $S_n = n/2 (a + L)$, where L is the last term.

Geometrical Progression (G.P.)

A sequence in which each term, except the first one bears a constant ratio with its preceding term, is called a geometrical progression, written as G.P. The constant ratio is called the common ratio of the G.P. We denote its first term by a and common ratio by r .

Example

2, 6, 18, 54, is a G.P. in which $a=2$ and $r=6/2=3$.
24, 12, 6, 3... Is a G.P. in which $a = 24$ and $r = 12/24=1/2$.

General Term of a G.P.: In a G.P. we have

$T_n = ar^{n-1}$
Sum of n terms of a G.P.
 $S_n = a (1-r^n) / (1-r)$, When $r < 1$
 $a (r^n - 1) / (r-1)$, When $r > 1$

Arithmetic Mean

A.M. of a and $b = 1/2 (a+b)$.

Geometric Mean

G.M. of a and $b = \sqrt{ab}$

Some General Series

$$(i) 1+2+3+4+\dots+n=1/2n(n+1).$$

$$(ii) 1^2+2^2+3^2+4^2+\dots+n^2 = n(n+1)(2n+1)/6$$

$$(iii) 1^3+2^3+3^3+4^3+\dots+n^3 = \{1/2 n(n+1)\}^2$$

Solved Examples

[Solved Examples](#)