Explore | Expand | Enrich

Progressions

Session 1

Quantitative Aptitude

Progressions (AP, GP, HP)

Progressions (or Sequences and Series) are numbers arranged in a particular order such that they form a predictable order. By predictable order, we mean that given some numbers, we can find next numbers in the series.

ARITHMETIC PROGRESSION(AP)

- A sequence of numbers is called an arithmetic progression if the difference between any two consecutive terms is always same.
- In simple terms, it means that next number in the series is calculated by adding a fixed number to the previous number in the series.
- This fixed number is called the common difference.

ARITHMETIC PROGRESSION(AP)

- For example, 2,4,6,8,10 is an AP because difference between any two consecutive terms in the series (common difference) is same (4 – 2 = 6 – 4 = 8 – 6 = 10 – 8 = 2).
  - If ‘a’ is the first term and ‘d’ is the common difference,nth term of an AP = a + (n-1) d
  - Arithmetic Mean = Sum of all terms in the AP / Number of terms in the AP
  - Sum of ‘n’ terms of an AP = 0.5 n (first term + last term) = 0.5 n [2a + (n-1) d]

GEOMETRIC PROGRESSION

- A sequence of numbers is called a geometric progression if the ratio of any two consecutive terms is always same.
- In simple terms, it means that next number in the series is calculated by multiplying a fixed number to the previous number in the series.
- This fixed number is called the common ratio.

GEOMETRIC PROGRESSION

For example, 2,4,8,16 is a GP because ratio of any two consecutive terms in the series (common difference) is same (4 / 2 = 8 / 4 = 16 / 8 = 2).

- If ‘a’ is the first term and ‘r’ is the common ratio,nth term of a GP = a rn-1
- Geometric Mean = nth root of product of n terms in the GP
- Sum of ‘n’ terms of a GP (r < 1) = [a (1 – rn)] / [1 – r]
- Sum of ‘n’ terms of a GP (r > 1) = [a (rn – 1)] / [r – 1]
- Sum of infinite terms of a GP (r < 1) = (a) / (1 – r)

HARMONIC PROGRESSION

A sequence of numbers is called a harmonic progression if the reciprocal of the terms are in AP. In simple terms, a,b,c,d,e,f are in HP if 1/a, 1/b, 1/c, 1/d, 1/e, 1/f are in AP.

- For two terms ‘a’ and ‘b’,Harmonic Mean = (2 a b) / (a + b)
- For two numbers, if A, G and H are respectively the arithmetic, geometric and harmonic means, then
- A ≥ G ≥ H
- A H = G2, i.e., A, G, H are in GP

Find the nth term for the AP : 11, 17, 23, 29, …

A man joins a company XYZ in January 2019 and he receive his first salary Rs 1000. After every month he gets an increment of Rs 500. What will be his salary after completion of 5 years of his service.

Find the sum of the AP in the above question till first 10 terms.

The sum of three numbers in a GP is 26 and their product is 216. Find the numbers.

A number 21 is divided into three parts which are in AP and sum of their squares is 155. Find the largest number

How many natural numbers between 200 to 500 are multiples of 3?

The 8th term of a GP is 16 times the 4th term. What will be the first term when its sixth term is 64.

A and B are two numbers whose AM is 61 and GM is 11. What will be the possible value of A?

Find the number of terms in the series 1/8, 1/2, 2…….8192.

A rubber ball rebounds (5/6)th of its height after striking to the ground form which it has fallen.Find the total distance that it travels before coming to rest, if it is gently dropped from a height of 360 metres.

A man joins a company XYZ in January 2019 and he receive his first salary Rs 1000. After every month he gets an increment of Rs 500. What will be his salary after completion of 5 years of his service.

LETS TRY SOME MORE!!!