

CLASS 10 MATHS – CHAPTER 5

ARITHMETIC PROGRESSION – ALL FORMULAE

Basic Idea

- Pattern-based sequence
- Follows Constant difference
- Real-life examples (salary, savings)
- Regular increase/decrease
- Easy to predict next term
- Used in daily calculations
- Based on fixed rule

Arithmetic Progression

- Sequence with constant difference
- Form: $a, a+d, a+2d, \dots$
- $a \rightarrow$ first term
- $d \rightarrow$ common difference
- $d = a_n - a_{n-1}$
- Can be positive/negative/zero
- Can be Finite or Infinite
- Simple linear pattern

Types Of AP

- Increasing $\rightarrow d > 0$
- Decreasing $\rightarrow d < 0$
- Constant $\rightarrow d = 0$
- Depends on sign of d
- Terms uniformly change
- Easy to identify pattern
- Used in questions
- Graph is straight line

n th Term

- $a_n = a + (n-1)d$
- Finds any term directly
- No need to write all terms
- Used to check term existence
- Helps find number of terms
- Important for numericals
- Substitute values carefully
- Most used formula

Sum Of AP

- $S_n = n/2 [2a + (n-1)d]$
- $S_n = n/2 (a + l)$
- $l \rightarrow$ last term
- Used to add large terms
- Saves time in exam
- Based on pairing method
- Important application
- Use correct formula

Special & Properties

- Sum of n natural numbers:
 $n(n+1)/2$
- Arithmetic Mean: $b = (a+c)/2$
- Equidistant terms sum equal
- Pattern remains constant
- Used in word problems
- Helps in analysis
- Applied in real life
- Important concept