

# Averages & Progressions

Concepts, Formulas & Examples

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# Table of Contents

- 1. Averages – Introduction & Types
- 2. Arithmetic Mean (AM)
- 3. Weighted Average
- 4. Arithmetic Progression (AP)
- 5. Geometric Progression (GP)
- 6. Harmonic Progression (HP)
- 7. Applications & Examples
- 8. Practice Questions

# Introduction to Averages

- Definition: A single value representing a group of values.
- Purpose: Helps in data comparison and analysis.

# Arithmetic Mean (AM)

- Formula:  $AM = \text{Sum of observations} / \text{Number of observations}$
- Example: Average of 10, 20, 30 is  $(10 + 20 + 30) / 3 = 20$

# Weighted Average

- Formula: Weighted Average =  $\Sigma(w_i * x_i) / \Sigma w_i$
- Used when values have different importance or weights.
- Example: Marks in different subjects with different weightage.

# Arithmetic Progression (AP)

- Definition: A sequence with constant difference between terms.
- General form:  $a, a + d, a + 2d, \dots$
- $n$ th term:  $a_n = a + (n - 1)d$
- Sum:  $S_n = n/2 * [2a + (n - 1)d]$

# Geometric Progression (GP)

- Definition: Sequence where each term is multiplied by a constant.
- General form:  $a, ar, ar^2, \dots$
- $n$ th term:  $a_n = ar^{(n-1)}$
- Sum:  $S_n = a(1 - r^n)/(1 - r)$ , for  $r \neq 1$

# Harmonic Progression (HP)

- Definition: Reciprocals of terms in AP.
- If  $a, b, c$  are in HP, then  $1/a, 1/b, 1/c$  are in AP.



# Applications

- Averages: used in sports, finance, academics.
- Progressions: used in calculating interests, salaries, etc.

# Practice Problems

- Practice problems for AM, AP, GP, HP.
- Includes numerical examples with answers.

# Summary

- Key concepts: Averages (AM, Weighted), Progressions (AP, GP, HP).
- Important formulas and real-life applications.

# Q&A / Thank You

- Questions & Answers
- Thank You!
- Contact: [Your Email / Info]