PROGRESSIONS – GEOMETRIC PROGRESSION (FOUNDATION → PLACEMENT LEVEL)

1. WHAT IS A GEOMETRIC PROGRESSION (GP)?

A Geometric Progression (GP) is a sequence of numbers where each term after the first is obtained by multiplying the previous term by a constant value called the common ratio.

2. IMPORTANT TERMS

- First term (a): First term of the GP
- Common ratio (r): Ratio of any term to its previous term
- Number of terms (n): Total number of terms

3. IMPORTANT FORMULAS

- n■■ term of GP: T■ = a · r^(n–1)
- Sum of n terms (r ≠ 1): S■ = a(r■ – 1)/(r – 1)
- If r = 1, then S■ = n · a

4. SOLVED EXAMPLES

- Example 1: Find 5■■ term of GP 3, 6, 12, ... → T■ = 48
- Example 2: Find sum of first 4 terms of GP 2, 4, 8, ... → S■ = 30
- Example 3: Number of terms in GP 1, 2, 4, ..., 128 → n = 8
- Example 4: Find 6■■ term of GP where a = 5, r = 3 → T■ = 1215

5. PRACTICE QUESTIONS (HOMEWORK)

- 1. Find the 6■■ term of GP: 2, 6, 18, ...
- 2. Find the sum of first 5 terms of GP: 3, 9, 27, ...
- 3. How many terms are there in GP: 1, 3, 9, ..., 729?
- 4. Find the 8■■ term of GP where a = 5, r = 2
- 5. Find the sum of first 4 terms of GP: 4, 2, 1, ...

6. ANSWERS (FOR SELF-CHECK)

- 1. 486
- 2. 363
- 3. 7
- 4. 640
- 5. 7.5