Mathematics — Ganita Manjari

Chapter 8 Test 6

Predicting What Comes Next: Exploring Sequences and Progressions

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Give exact answers unless an approximation is requested.
3. Term positions start at 1 unless a stage number of 0 is explicitly given.

SECTION A

(5 questions × 1 mark = 5 marks)

1. The common ratio of $1, -1, 1, -1, \ldots$ is:

(A) 1 (B) -1

(C) 0 (D) 2

2. Which GP has positive terms that strictly decrease?

(A) $a = 2, r = 3$ (B) $a = 2, r = -2$

(C) $a = 2, r = 1$ (D) $a = 2, r = \frac{1}{2}$

3. For $3, -6, 12, -24, \ldots$, which statement is true?

(A) Signs alternate and magnitudes increase

(B) All terms increase

(C) All terms are negative

(D) Magnitudes are constant

4. Can a GP with non-zero first term and non-zero ratio have a zero term?

(A) Yes, always at an even position

(B) Yes, if the ratio is negative

(C) No, every ar^{n-1} is non-zero

(D) Only when the ratio is 1

5. If a GP has non-zero terms and ratio $\frac{2}{3}$, what is the ratio of the sequence of their reciprocals?

(A) $\frac{2}{3}$ (B) $\frac{3}{2}$

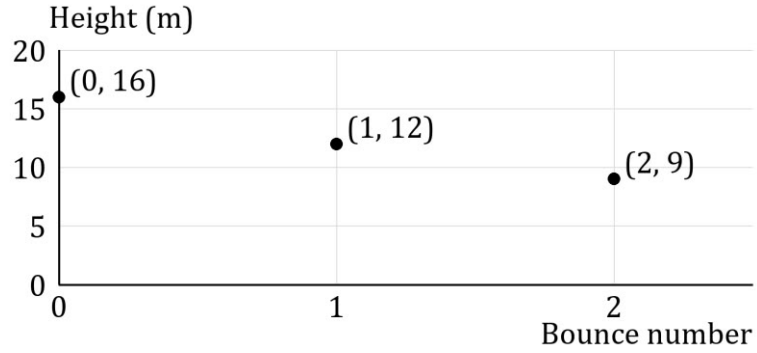
(C) $-\frac{2}{3}$ (D) $\frac{1}{3}$

SECTION B

(4 questions × 2 marks = 8 marks)

6. Verify that $5, \frac{15}{4}, \frac{45}{16}, \ldots$ is a GP, and write its nth term.

7. The plotted heights in figure follow a fixed rebound ratio. Find that ratio and predict the height after Bounce 3.



8. Find every real value of x for which $4, x, 36$ are consecutive terms of a GP.

9. Find the sum of the first 101 terms of the GP $3, -3, 3, -3, \ldots$, explaining how you group the terms.

SECTION C

(3 questions × 3 marks = 9 marks)

10. Complete the two blanks in figure. Give an explicit rule and explain why the terms do not decrease steadily.

Position	1	2	3	4	5
Term	8	-4	2	?	?

11. A ball is dropped from 16 m and rebounds to half its previous height. Find the total vertical distance travelled by the time it hits the ground for the fourth time.

12. A GP with non-zero terms has first two terms summing to -4, and its fifth term is four times its third term. Find all possible first terms and common ratios.

SECTION D

(1 application question × 3 marks = 3 marks)

13. A machine is worth ₹10,000 initially. At the end of each year its value becomes 80% of its value a year earlier. Find its value after 3 years and the total decrease from its initial value.