Mathematics — Ganita Manjari

Chapter 8 Test 10

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. An infinite sequence of non-zero terms is both an AP and a GP. Its common difference must be:

(A) 0 (B) 1

(C) -1 (D) Any non-zero number

2. What is the common ratio of $2, 2\sqrt{2}, 4, \ldots$?

(A) 2 (B) $\sqrt{2}$

(C) 4 (D) $1/2$

3. A GP has positive first term and negative common ratio. Which terms are positive?

(A) Even-position terms only (B) Every term

(C) No term (D) Odd-position terms only

4. The triangular numbers $1, 3, 6, 10, \ldots$ fail to be a GP because:

(A) They are all positive

(B) They have a recursive rule

(C) Their consecutive ratios vary

(D) Their first term is 1

5. Which list gives the first four terms of the sequence of prime numbers in increasing order?

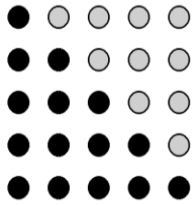
(A) 1,2,3,5 (B) 2,3,5,7

(C) 2,4,6,8 (D) 3,5,7,9

SECTION B

(4 questions × 2 marks = 8 marks)

6. Let T_n be the nth triangular number. Use figure to show that $T_{n-1} + T_n = n^2$. Hence find $T_{11} + T_{12}$.



5 rows × 5 columns

7. A finite AP starts at 4, ends at 94 and contains 19 terms. Find its common difference.

8. A five-term GP is 2,6,18,54,162. Write an explicit rule for the same finite sequence read backwards, stating its permitted positions.

9. For $s_1 = 3$ and $s_n = s_{n-1}(s_{n-1} - 1)$ for $n \geq 2$, find s_2, s_3, s_4. Is it a GP?

SECTION C

(3 questions × 3 marks = 9 marks)

10. Let $P_1 = 1, P_2 = 2$ and $P_n = P_1 + P_2 + \cdots + P_{n-1} + 1$ for $n \geq 3$. Find a simpler recurrence and an explicit rule, then calculate P_8.

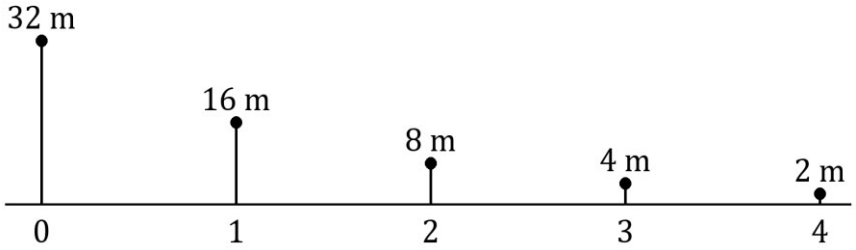
11. Three consecutive terms of a GP have sum 26 and sum of squares 364. Find the terms in all possible orders.

12. How many three-digit multiples of 7 are not divisible by 14? Show how you count them.

SECTION D

(1 application question × 3 marks = 3 marks)

13. The ball in figure falls from 32 m and rebounds to half its previous height. Find the first bounce below 3 m and the total distance travelled up to its top.



Bounce number (0 = initial height)