Mathematics — Ganita Manjari

Chapter 12 Test 10

Quadrilaterals

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. Figures are not necessarily to scale. Give reasons for geometrical conclusions.

SECTION A

(5 questions × 1 mark = 5 marks)

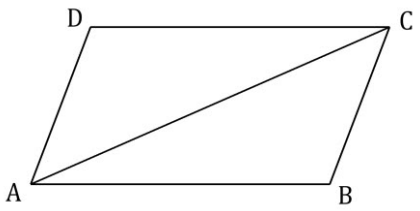
1. If two opposite sides of a four-edge figure cross, all four vertices must be:
(A) Collinear
(B) Coplanar
(C) Equally spaced
(D) Vertices of a rectangle

2. Four points are in convex position. Allowing crossings and counting reversed or cyclic orders as identical, how many four-edge figures use them?
(A) 1 (B) 2
(C) 3 (D) 6

3. How many quadrilaterals can share one given Varignon parallelogram?
(A) Exactly one
(B) Exactly two
(C) Exactly four
(D) Infinitely many

4. Two half-turns about the same centre produce which overall effect?
(A) Return to the original position (B) A quarter-turn
(C) Enlarge the figure (D) Reflect in a line

5. The hinged frame in figure has five rigid bars. Why are its triangular parts rigid?



(A) Their areas must be equal (B) SSS fixes each triangle
(C) AC bisects every angle (D) All four corner angles are equal

SECTION B

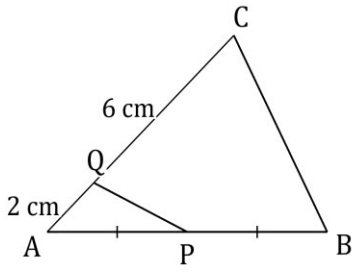
(4 questions × 2 marks = 8 marks)

6. A half-turn about P sends A to B; a half-turn about Q sends B to C. If A, B, C are non-collinear and PQ = 4 cm, prove that AC ∥ PQ and find AC.

7. An oblique segment joins the first and seventh of seven equally spaced parallel lines. Which line meets its midpoint? Justify.

8. The side midpoints of a non-planar quadrilateral are P, Q, R, S in order. Prove that PQRS is a planar parallelogram.

9. In figure, P is the midpoint of AB and $PQ = \frac{1}{2}BC$. Can PQ be parallel to BC? Explain what the marked lengths show.

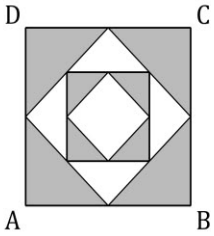


SECTION C

(3 questions × 3 marks = 9 marks)

10. In parallelogram ABCD, M, N are midpoints of AB, CD. DM, BN meet AC at X, Y respectively. Prove AX = XY = YC.

11. Starting with a square, join successive side midpoints three times, as in figure. What fraction of the original square is shaded? Justify.



12. A self-intersecting four-edge figure ABCD has $AC \parallel BD$. Explain why its four side midpoints P, Q, R, S lie on one line. Does this contradict the theorem for simple quadrilaterals?

SECTION D

(1 application question × 3 marks = 3 marks)

13. On diagonal BD of parallelogram frame ABCD, points D, P, Q, B occur in this order, with DP = BQ. Prove that the inner frame APCQ is a parallelogram.