Mathematics — Ganita Manjari

Chapter 12 Test 7

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.

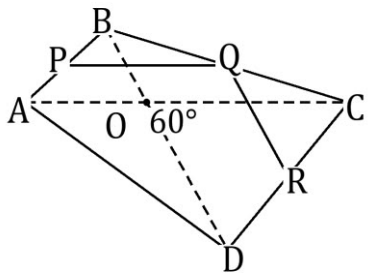
SECTION A

(5 questions × 1 mark = 5 marks)

1. If a quadrilateral has equal diagonals, its Varignon parallelogram must be a:

(A) Rectangle
(B) Rhombus
(C) Square
(D) Non-convex quadrilateral

2. In figure, P, Q, R are midpoints of AB, BC, CD, and $\angle COD = 60°$. Find $\angle PQR$.



(A) 30°
(B) 60°
(C) 90°
(D) 120°

3. A quadrilateral's diagonals measure 8 cm and 14 cm. Its Varignon parallelogram has perimeter:

(A) 11 cm
(B) 44 cm
(C) 22 cm
(D) 28 cm

4. For successive side-midpoints P, Q, R, S of $ABCD$, which two segments must be parallel to AC?

(A) PQ and RS
(B) QR and PS
(C) PR and QS
(D) AB and CD

5. If a quadrilateral's Varignon parallelogram is a rectangle, the original diagonals must be:

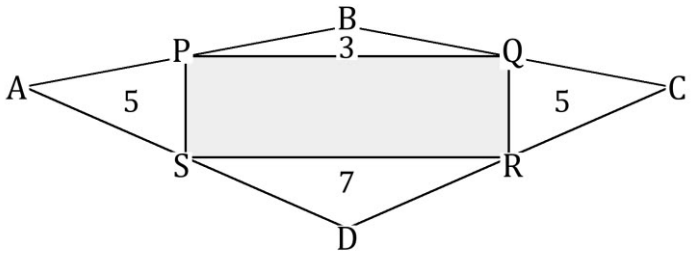
(A) Parallel
(B) Equal
(C) Perpendicular
(D) Mutually bisecting

SECTION B

(4 questions × 2 marks = 8 marks)

6. Let P, Q, R, S be successive side-midpoints of quadrilateral $ABCD$. Prove $PQRS$ is a parallelogram using one pair of opposite sides.

7. In figure, P, Q, R, S are side-midpoints. The numbers are corner-triangle areas in cm^2. Find the area of $PQRS$, with justification.



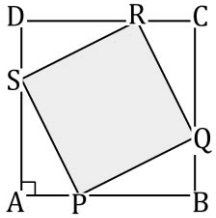
8. Prove that a quadrilateral's Varignon parallelogram has smaller perimeter than the original quadrilateral.

9. Side-midpoints P, Q, R, S of $ABCD$ have connectors $PR = 14$ cm and $QS = 18$ cm, meeting at O. Find $PO + QO$ and justify.

SECTION C

(3 questions × 3 marks = 9 marks)

10. In square $ABCD$ of side 6 cm, $AP = BQ = CR = DS = 2$ cm as in figure. Prove $PQRS$ is a parallelogram although its vertices are not side-midpoints.



11. A student says Varignon's theorem fails for a non-convex quadrilateral because its diagonals do not intersect. Explain the error and prove the theorem still applies.

12. Let P, Q, R, S be successive side-midpoints of $ABCD$. If $PR \perp QS$, prove that $AC = BD$.

SECTION D

(1 application question × 3 marks = 3 marks)

13. A panel's perpendicular diagonals meet at O, with $AO = 4$, $OC = 6$ and $BO = DO = 5$ cm. A frame joins its side-midpoints. Find the frame's shape and perimeter. Is the panel square?