Mathematics — Ganita Manjari

Chapter 9 Test 6

Propositions and their Converses

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. The paper has four sections: A, B, C and D.
2. Section A: 5 × 1 = 5 marks; Section B: 4 × 2 = 8 marks; Section C: 3 × 3 = 9 marks; Section D: 1 × 3 = 3 marks.
3. Select one correct option in Section A. Give reasons or counterexamples wherever asked.
4. Use of calculators is not allowed.

SECTION A

(5 questions × 1 mark = 5 marks)

1. Which is the converse of: If a quadrilateral is a parallelogram, then both pairs of opposite sides are equal?

(A) If both pairs of opposite sides are equal, the quadrilateral is a parallelogram.
(B) If a quadrilateral is a parallelogram, its diagonals are equal.
(C) If opposite sides are unequal, the quadrilateral is a parallelogram.
(D) If a quadrilateral is a rectangle, its opposite sides are equal.

2. Which is a counterexample to the claim: Every rhombus is a square?

(A) A square of side 3 cm. (B) A rectangle with sides 3 cm and 5 cm.
(C) A rhombus with angles 60° and 120°. (D) A scalene triangle.

3. If both diagonals of a quadrilateral bisect each other, which conclusion must hold?

(A) It is a square. (B) It is a parallelogram.
(C) Its diagonals are equal. (D) Its diagonals are perpendicular.

4. Which cyclic side-length pattern disproves: Two pairs of equal adjacent sides imply that all four sides are equal?

(A) 3, 3, 3, 3 (B) 3, 5, 3, 5
(C) 3, 4, 5, 6 (D) 3, 3, 5, 5

5. Which property alone guarantees that a quadrilateral is a rectangle?
(A) Three of its angles are right angles.
(B) One pair of opposite sides is equal.
(C) Its diagonals are perpendicular.
(D) Two adjacent sides are equal.

SECTION B

(4 questions × 2 marks = 8 marks)

6. Write the converse and state both truth values. If a quadrilateral is a rectangle, then both pairs of its opposite sides are parallel.

7. Write the converse and state both truth values. If a quadrilateral is a rhombus, then its diagonals are perpendicular.

8. Write the converse and state both truth values. If a quadrilateral is a square, then each diagonal bisects the angles at its endpoints.

9. Write the converse and state both truth values. If a quadrilateral has one pair of opposite sides that are both equal and parallel, then it is a parallelogram.

SECTION C

(3 questions × 3 marks = 9 marks)

10. In quadrilateral $ABCD$, $\angle A = \angle C$ and $\angle B = \angle D$. Prove that $ABCD$ is a parallelogram. Write the converse of this proposition.

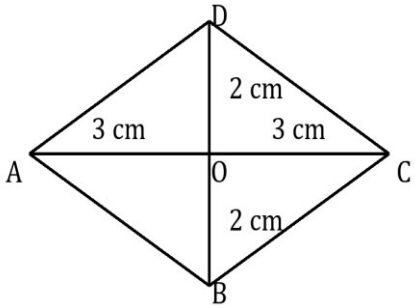
11. In quadrilateral $ABCD$, $AB = AD$ and $CB = CD$. Prove that $\angle ABC = \angle CDA$. Write its converse, and give a counterexample to the converse.

12. Consider: If a quadrilateral is a rhombus with one right angle, then it is a square. Justify the proposition. Write its converse and state whether the converse is true.

SECTION D

(1 application question × 3 marks = 3 marks)

13. In figure, $AC \perp BD$ at O, $AO = OC = 3$ cm and $BO = OD = 2$ cm. Consider: Perpendicular diagonals that bisect each other guarantee a square.



(i) Find AB^2 and BC^2.
(ii) Does the figure disprove the claim? Give a reason.
(iii) Write the converse of the claim and state whether it is true.