Mathematics — Ganita Manjari

Chapter 9 Test 3

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. Figures are not necessarily drawn to scale.

SECTION A

(5 questions × 1 mark = 5 marks)

1. For nonzero real numbers x, y, which condition is equivalent to $1/x = 1/y$?

(A) $x = -y$
(B) $x + y = 1$
(C) $x = y$
(D) $xy = 1$

2. Consider: 'If two numbers have sum 12, then their arithmetic mean is 6.' Which describes the proposition and its converse?

(A) Both true
(B) Both false
(C) Only the proposition true
(D) Only the converse true

3. Which pair disproves 'Triangles with equal perimeters are congruent'? Each bracket lists side lengths in centimetres.

(A) (3,4,5) and (3,4,5)
(B) (3,4,5) and (2,5,5)
(C) (3,4,5) and (5,5,6)
(D) (4,4,4) and (4,4,4)

4. Given that B lies on segment AC, which is the converse of 'If $AB = BC$, then B is the midpoint of AC'?

(A) If $AB = AC$, then $B = C$.
(B) If B is midpoint of AC, then $AB = BC$.
(C) If $AB = BC$, B is midpoint of AC.
(D) If A is midpoint of BC, then $AB = AC$.

5. For a real number x, consider: 'If $2x + 3 = 11$, then $x = 4$.' What is the truth of its converse?

(A) False because x could be -4
(B) False because x could be 0
(C) True because $2(4) + 3 = 11$
(D) Cannot be decided

SECTION B

(4 questions × 2 marks = 8 marks)

6. For real numbers a, x, y: 'If $x = y$, then $a + x = a + y$.' Write the converse and justify both statements.

7. For real numbers x, y, consider: 'If $x + y = x - y$, then $y = 0$.' Write its converse and justify both directions.

8. Write the converse of: "A point on the perpendicular bisector of a segment is equidistant from its endpoints." State whether both directions are true.

9. For triangles with equal bases: "Equal areas imply equal corresponding heights." Write the converse and justify both directions.

SECTION C

(3 questions × 3 marks = 9 marks)

10. For real a, x, y, write the converse of "$x = y \Rightarrow ax = ay$". Explain the restriction needed to justify it and give a counterexample without that restriction.

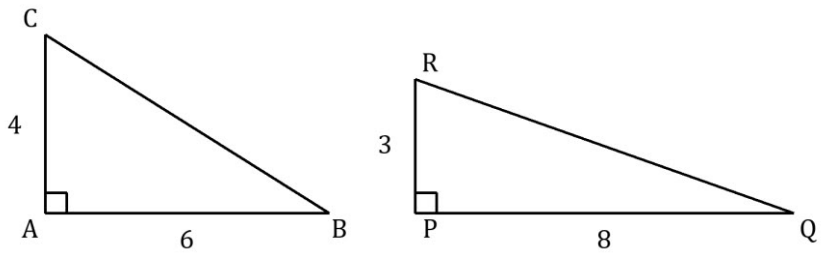
11. Let a, b, c, d be real numbers with $b \neq 0$ and $d \neq 0$. Prove that $a/b = c/d$ implies $ad = bc$. State and prove its converse.

12. If two corresponding angle pairs of two triangles are equal, the third pair is equal. Justify this, write the converse and disprove it using angle measures.

SECTION D

(1 application question × 3 marks = 3 marks)

13. The two triangles in figure are right-angled at A and P. All lengths are in centimetres.



(i) Calculate their areas.
(ii) Test the claim: "Equal areas imply congruent triangles."
(iii) Write the converse and state whether it is true.