Mathematics — Ganita Manjari

Chapter 9 Test 7

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 claim is true for every real number x?

(A) $x^2 > x$ (B) $x^2 \geq 1$
(C) $x^2 + 1 > 0$ (D) $x^3 > x$

2. Which is the converse of: If $x > y$, then $x + 4 > y + 4$?

(A) If $x + 4 > y + 4$, then $x > y$.
(B) If $x > y$, then $x + 4 < y + 4$.
(C) If $x < y$, then $x + 4 < y + 4$.
(D) If $x + 4 = y + 4$, then $x = y$.

3. Which pair disproves: If the product of two real numbers is positive, then both numbers are positive?

(A) 2 and 3 (B) 0 and 3
(C) −2 and 3 (D) −2 and −3

4. For real x, consider: If $x < 0$, then $x < 1$. Which truth pair is correct for the proposition and its converse?

(A) False, false (B) True, false
(C) False, true (D) True, true

5. For a nonzero real number x, which condition is equivalent to $x < 0$?

(A) $1/x < 0$ (B) $x^2 < 0$
(C) $x + 1 < 0$ (D) $x^3 > 0$

SECTION B

(4 questions × 2 marks = 8 marks)

6. Write the converse and state both truth values. For real numbers x, y: If $x > 0$ and $y > 0$, then $x + y > 0$.

7. Write the converse and state both truth values. For a real number x: If $x < 0$, then $x^3 < 0$.

8. Write the converse and state both truth values. For a real number x: If $x > 1$, then $x^2 > x$.

9. Write the converse and state both truth values. For real numbers x, y: If $x + y = 0$, then one number is positive and the other is negative.

SECTION C

(3 questions × 3 marks = 9 marks)

10. For real numbers a, b, prove: If $ab = 0$, then $a = 0$ or $b = 0$. Write its converse and justify it.

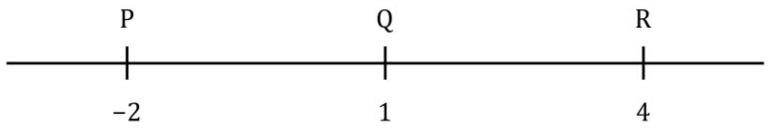
11. A student claims: Multiplying both sides of a strict inequality by any nonzero real number preserves its direction. Give a counterexample. State the correct rule for positive and negative multipliers, with one example of each.

12. Is the claim "If $a < b$ and $c < d$, then $ac < bd$" true for all real numbers? Give a counterexample. Prove that the claim is true when all four numbers are positive.

SECTION D

(1 application question × 3 marks = 3 marks)

13. Choose x and y from the three numbers marked in figure. Consider: If $x < y$, then $1/x < 1/y$.



(i) Give a counterexample to the proposition.
(ii) Write the converse and give a counterexample to it.
(iii) Give a choice of x, y for which both $x < y$ and $1/x < 1/y$ hold.