Mathematics — Ganita Manjari

Chapter 9 Test 2

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. Taking the converse twice of $X \Rightarrow Y$ gives which statement?

(A) $Y \Rightarrow X$
(B) $X \Rightarrow Y$
(C) $X \Rightarrow X$
(D) $Y \Rightarrow Y$

2. Which statement has the same meaning as 'Y happens when X happens'?

(A) If Y, then X.
(B) If X, then Y.
(C) X and Y are both false.
(D) X never happens.

3. A counterexample to 'If X, then Y' must have which combination?

(A) X true and Y true
(B) X false and Y true
(C) X true and Y false
(D) X false and Y false

4. Which possibility is ruled out solely by knowing that a proposition is true?

(A) Its converse is true.
(B) Its converse is false.
(C) Its converse has not been checked.
(D) None of these possibilities.

5. A claim about every positive integer works for the first 200 integers tested. What has been established?

(A) The claim is proved for all positive integers.
(B) The converse is proved.
(C) Only the tested cases have been verified.
(D) No counterexample can exist.

SECTION B

(4 questions × 2 marks = 8 marks)

6. For an integer n, consider: 'If n is even, then $n + 1$ is odd.' Write the converse and justify its truth.

7. For integers a, b: 'If a and b are odd, then $a + b$ is even.' Write the converse and disprove it with a counterexample.

8. For integers a, b, consider: 'If ab is odd, then both a and b are odd.' Write its converse and state whether both statements are true.

9. For a positive integer n, consider: 'If $n > 10$, then n is even.' Write its converse. Give one counterexample to each statement.

SECTION C

(3 questions × 3 marks = 9 marks)

10. For integers a, b, consider: 'If $a + b$ is odd, then ab is even.' Justify the proposition, write its converse and give a counterexample to the converse.

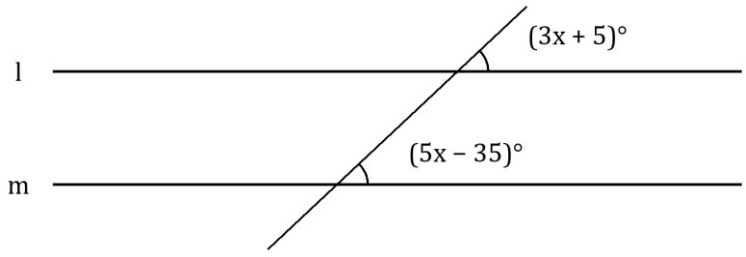
11. For an integer n, prove: 'If n is odd, then n^2 is odd.' Write the converse and justify why it is also true.

12. Consider: 'If two positive integers are consecutive, then their product is even.' Prove the statement. Write its converse and decide its truth with a counterexample.

SECTION D

(1 application question × 3 marks = 3 marks)

13. The lines l and m in figure are parallel.



(i) Form an equation using the marked angles and find x.
(ii) Find each marked angle.
(iii) State the converse of the angle property used.