



PROPOSITIONS AND THEIR CONVERSES

1 WHAT ARE PROPOSITION AND CONVERSE?

Proposition

- A proposition is a statement that can be either true or false.
- It has two parts – a hypothesis (if part) and a conclusion (then part).

Converse

- The converse of a proposition is formed by interchanging the hypothesis and the conclusion.
- It may or may not be true.

The converse of a true proposition is not necessarily true.

Example

Proposition:

If a number is divisible by 4, then it is divisible by 2.

Converse:

If a number is divisible by 2, then it is divisible by 4.

The given proposition is true, but its converse is false.

2 KEY CONCEPTS

- ★ **Proposition:** A statement that can be true or false.
- ★ **Converse:** Formed by interchanging the hypothesis and conclusion.
- ★ **Symbolic form:** If p , then $q \rightarrow$ **Converse:** If q , then p .
- ★ **Implication:** If a proposition is true, its converse may be true or false.
- ★ To prove a statement and its converse, we need to check their truth values separately.

3 PRESENTATION OF A PROPOSITION

Statement

If two angles of a triangle are equal, then the sides opposite to them are equal.

Example

In $\triangle ABC$, if $\angle B = \angle C$, then $AB = AC$.

Converse

If two sides of a triangle are equal, then the angles opposite to them are equal.

Example

In $\triangle ABC$, if $AB = AC$, then $\angle B = \angle C$.

4 CONVERSE OF A PROPOSITION

Statement

If a number is a multiple of 5, then it is a multiple of 10.

Converse

If a number is a multiple of 10, then it is a multiple of 5.

Example

15 is a multiple of 5, but it is not a multiple of 10. So, the proposition is true but its converse is false.

5 TRUTH OF A PROPOSITION AND ITS CONVERSE

Proposition	Converse
If a triangle is equilateral, then it is isosceles.	If a triangle is isosceles, then it is equilateral.
True	False
If a number is divisible by 3, then it is divisible by 3.	If a number is divisible by 3, then it is divisible by 6.
True	False
If a figure is a square, then it is a rectangle.	If a figure is a rectangle, then it is a square.
True	False

6 IMPORTANT POINTS

- ★ A true proposition does not guarantee that its converse is true.
- ★ A false proposition also has a converse, and it may be true or false.
- ★ To prove a statement and its converse, check both separately.
- ★ In geometry, many propositions (like 'if a triangle is equilateral, then it is isosceles') have true converses, while others do not.

7 COMMON VARIATIONS

- If a quadrilateral is a square, then it is a rectangle.
(Converse: If a quadrilateral is a rectangle, then it is a square.)
- If a number is even, then it is divisible by 2.
(Converse: If a number is divisible by 2, then it is even.)
- If two angles are complementary, then their sum is 90° .
(Converse: If two angles have a sum of 90° , then they are complementary.)
- If a line is parallel to another line, then they do not intersect.
(Converse: If two lines do not intersect, then they are parallel.)
- If a triangle is isosceles, then two sides are equal.
(Converse: If two sides are equal, then the triangle is isosceles.)

8 QUICK REVISION

- ✓ Proposition $\rightarrow$ If p , then q .
- ✓ Converse $\rightarrow$ If q , then p .
- ✓ Not always true.
- ✓ Check both separately.
- ✓ Use examples to verify.
- ✓ Some propositions are true and reversible, others are not.

9 KEY TAKEAWAY



The converse of a proposition is formed by interchanging the hypothesis and conclusion.

A true proposition does not always have a true converse.

Same statement,
new order –
may change
the truth!

10 REMEMBER

Proposition and its converse can be equal in meaning, but not always in truth!