

CLASS 9 · HOTS · OLYMPIAD PREPARATION · DPP SHEET

## Chapter 9: HOTS: Propositions and Converses (Class 9)

Daily practice problems: 8 questions with an answer key

Try every question on your own first. The answer key is on the last page.

1. Write the converse of "If  $x = 3$ , then  $x^2 = 9$ ". Is the converse true?
2. Give a counterexample to the statement "The square of every number is greater than the number itself".
3. Is " $2 + 2 = 5$ " a proposition?
4. "If a triangle is equilateral, then it is isosceles" is true. Write its converse and decide whether it is true.
5. Write the contrapositive of "If it rains, then the ground is wet".
6. Is the statement "Every rectangle is a square" true?
7. "If a number ends in 0, then it is divisible by 5" is true. Is its converse true?
8. Is the statement " $n^2 + n + 41$  is a prime number for every natural number  $n$ " true?

## Answer Key

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1. "If  $x^2 = 9$ , then  $x = 3$ ". It is false, because  $x = -3$  also gives  $x^2 = 9$ .
2.  $x = 1$  (or  $x = \frac{1}{2}$  or  $x = 0$ ):  $1^2 = 1$  is not greater than 1.
3. Yes. It is a false statement.
4. "If a triangle is isosceles, then it is equilateral". False: a triangle with sides 5, 5 and 6 is a counterexample.
5. "If the ground is not wet, then it did not rain".
6. False. A rectangle of sides 2 cm and 3 cm is a counterexample.
7. The converse is "If a number is divisible by 5, then it ends in 0". It is false: 15 is a counterexample.
8. False. For  $n = 40$  the value is  $1681 = 41^2$ .

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