

Mathematics

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(Chapter – 9) (Propositions and their Converses) (Assignment 2)

(Class – 9)

Name _____

Date _____

Answer all 15 questions. Choose one option for each MCQ. Show your reasoning wherever asked.

Section A: Multiple Choice Questions

1. If it rains, then the road is wet.

Choose the correct assessment of this proposition and its converse.

- (a) Both are true. (b) Only the proposition is true.
(c) Only the converse is true. (d) Both are false.

2. If a number is a multiple of 6, then it is a multiple of 3.

Which equation justifies this proposition for an integer k ?

- (a) $6k = 3(2k)$ (b) $6k = 3 + k$
(c) $6k = 3k$ (d) $6k = 2(3 + k)$

3. If a quadrilateral is a square, then all its angles are equal.

Which shape disproves the converse?

- (a) A square of side 4 cm (b) A non-square rhombus
(c) A rectangle of sides 3 cm and 5 cm (d) A triangle with equal angles

4. Which integer disproves the statement “Every odd positive integer is prime”?

- (a) 2 (b) 3
(c) 5 (d) 9

5. A student finds 20 examples supporting a statement about all positive integers. What can the student conclude?

- (a) The statement is proved. (b) Its converse is proved.
(c) A general proof is still needed. (d) The statement must be false.

Section B: Very Short Answer Questions

6. If $x = y$, then $a + x = a + y$, where x, y and a are any three numbers.

Write the converse and state whether it is true.

Answer:

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7. If two sides of a triangle are equal, then the angles opposite the equal sides are equal.
Write its converse.

Answer:

8. If a proposition is true, then is its converse always true?

Answer:

9. For the statement “If an integer is divisible by 15, then it is divisible by 5”, identify the condition and the conclusion.

Answer:

10. Write the converse of “If a triangle is equilateral, then it is isosceles”. Here, isosceles means having at least two equal sides. Is the converse true?

Answer:

Section C: Short and Long Answer Questions

11. If n is divisible by 60, then it is divisible by both 5 and 12.

Let n be a positive integer. Write the converse and justify both statements.

Answer:

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- 12.** A student says, “If two positive integers have an even sum, then both integers are even.” Write the converse. Decide whether each statement is true, giving a reason or a counterexample.

Answer:

- 13.** A quadrilateral has four equal sides. Does this guarantee that it is a square? Write a true statement whose converse is the claim being tested, and give a counterexample to the claim.

Answer:

- 14.** If a and b are perfect squares, then ab is a perfect square.

Let a and b be positive integers. Frame the converse. Determine whether each statement is true, proving a true statement and giving a counterexample to a false statement.

Answer:

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(i) Justify the statement.

Answer: