

National Institute of Open Schooling (NIOS)
Senior Secondary Course
Lesson – 38: Mathematical Reasoning
Worksheet – 38

1. Check the following sentences are statements. Give reason for your answer.
 - (a) There is no rain without clouds.
 - (b) Taj Mahal is the most beautiful building of the world.
 - (c) Every function is a relation

2. Write the negation of the following statements:
 - (a) All primes are odd
 - (b) Every integer is greater than zero

3. Identify the component statements of the following compound statements.
 - (a) The sky is blue and the grass is green.
 - (b) All rational numbers are real and all real numbers are complex

4. Check the pair of statement negation of each other:
 - (a) The number x is a rational number
 - (b) The number x is an irrational number.

5. Write the component statements and check the compound statement is true or false.
 - (a) 59 is divisible by 3 and 5
 - (b) All living things have two eyes and two legs.

6. Write the truth value of the following statements
 - (a) New Delhi is in India or $2+2 = 5$.
 - (b) New Delhi is in America or $2+2 = 5$.

7. Identify the quantifier and write the negation of each of the following statement:
 - (a) All English teachers are Female.
 - (b) There exists a real number, whose square is not positive.

8. Check whether the following pair of statements are negations of each other. Give reasons for your answer.
 - (a) $x + y = y + x$ is true for every real number x and y .
 - (b) There exists real numbers x and y for which $x + y = y + x$.

9. Write the composite and converse of following statements:
 - (a) If P is a prime number, then P is odd
 - (b) If the two lines are parallel, then they do not intersect in the same plane.

10. Prove that $\sqrt{19}$ is NOT a rational number.