

Mathematics

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(Chapter – 14) (Mathematical Reasoning)

(Class – XI)

Exercise 14.2

Question 1:

Write the negation of the following statements:

- (i) Chennai is the capital of Tamil Nadu.
- (ii) $\sqrt{2}$ is not a complex number.
- (iii) All triangles are not equilateral triangle.
- (iv) The number 2 is greater than 7.
- (v) Every natural number is an integer.

Answer 1:

- (i) Chennai is not the capital of Tamil Nadu.
- (ii) $\sqrt{2}$ is a complex number.
- (iii) All triangles are equilateral triangles.
- (iv) The number 2 is not greater than 7.
- (v) (v) Every natural number is not an integer.

Question 2:

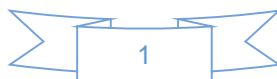
Are the following pairs of statements negations of each other?

- (i) The number x is not a rational number.
The number x is not an irrational number.
- (ii) The number x is a rational number.
The number x is an irrational number.

Answer 2:

(i) The negation of the first statement is “the number x is a rational number”.

This is same as the second statement. This is because if a number is not an irrational number, then it is a rational number.



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Therefore, the given statements are negations of each other.

(ii) The negation of the first statement is “the number x is not a rational number”. This means that the number x is an irrational number, which is the same as the second statement. Therefore, the given statements are negations of each other.

Question 3:

Find the component statements of the following compound statements and check whether they are true or false.

- (i) Number 3 is prime or it is odd.
- (ii) All integers are positive or negative.
- (iii) 100 is divisible by 3, 11 and 5.

Answer 3:

(i) The component statements are as follows.

p : Number 3 is prime. q : Number 3 is odd.

Both the statements are true.

(ii) The component statements are as follows.

p : All integers are positive. q : All integers are negative.

Both the statements are false.

(iii) The component statements are as follows.

p : 100 is divisible by 3. q : 100 is divisible by 11. r : 100 is divisible by 5.

Here, the statements, p and q , are false and statement r is true.

