

EXERCISE 14.2

1. Write the negation of the following statements:

(i) Chennai is the capital of Tamil Nadu.

Sol. Chennai is not the capital of Tamil Nadu.

(ii) $\sqrt{2}$ is not a complex number.

Sol. $\sqrt{2}$ is a complex number.

(iii) All triangles are not equilateral triangle.

Sol. All triangles are equilateral triangles.

(iv) The number 2 is greater than 7.

Sol. The number 2 is not greater than 7.

(v) Every natural number is an integer.

Sol. Every natural number is not an integer.

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.

Sol. The negation of the first statement is "the number x is a rational number", which is the same as the second statement". This is because when a number is not irrational, it is a rational. Therefore, the given pair are negations of each other.

(ii) The number x is a rational number.

The number x is an irrational number.

Sol. The negation of the first statement is " x is an irrational number" which is the same as the second statement. Therefore, the pair are negations of each other.

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.

Sol. Component: Number 3 is prime is true

Component: Number 3 is odd is also true.

\therefore The compound statement: Number 3 is prime or 3 is odd is also true.

(ii) All integers are positive or negative.

Sol. Component p : All integers are positive is false

Component q : All integers are negative is also false.

\therefore The compound statement p (OR) (AND) is false.

(iii) 100 is divisible by 3, 11 and 5.

Sol. 100 is divisible by 3 is false, 100 is divisible by 11 is false and 100 is divisible by 5 (True).

\therefore The compound statement p and q and r is false.