Number Systems (Math)

Exercise 1.2

Question 1:

State whether the following statements are true or false. Justify your answers.

(i) Every irrational number is a real number.

(ii) Every point on the number line is of the form, $\sqrt{m}$ where m is a natural number.

(iii) Every real number is an irrational number.

Answer:

(i) True; since the collection of real numbers is made up of rational and irrational numbers.

(ii) False; as negative numbers cannot be expressed as the square root of any other number.

(iii) False; as real numbers include both rational and irrational numbers. Therefore, every real number cannot be an irrational number.

Question 2:

Are the square roots of all positive integers irrational? If not, give an example of the square root of a number that is a rational number.

Answer:

If numbers such as $\sqrt{4} = 2$, $\sqrt{9} = 3$ are considered,

Then here, 2 and 3 are rational numbers. Thus, the square roots of all positive integers are not irrational.
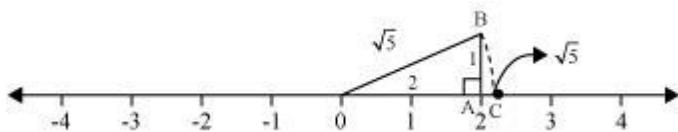
Question 3:

Show how $\sqrt{5}$ can be represented on the number line.

Answer:

We know that, $\sqrt{4} = 2$

And, $\sqrt{5} = \sqrt{(2)^2 + (1)^2}$

Mark a point 'A' representing 2 on number line. Now, construct AB of unit length perpendicular to OA. Then, taking O as centre and OB as radius, draw

an arc intersecting number line at C.

C is representing. $\sqrt{5}$