

Mathematics

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(Chapter – 1) (Number Systems)(Exemplar Problems)

(Class – IX)

Exercise 1.3

Question 5:

Locate $\sqrt{5}$, $\sqrt{10}$ and $\sqrt{17}$ on the number line.

Answer 5:

Presentation of $\sqrt{5}$ on number line:

We write 5 as the sum of the squares of two natural numbers:

$$5 = 1 + 4 = 1^2 + 2^2$$

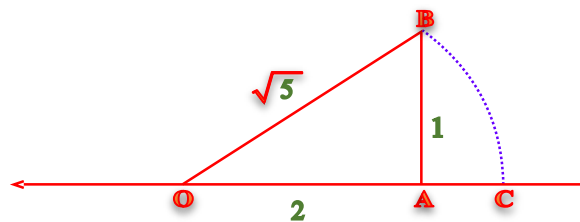
On the number line, take $OA = 2$ units.

Draw $BA = 1$ units, perpendicular to OA . Join OB .

By Pythagoras theorem,

$$OB = \sqrt{5}$$

Using a compass with centre O and radius OB , draw an arc which intersects the number line at the point C . Then, C corresponds to $\sqrt{5}$.



Presentation of $\sqrt{10}$ on number line:

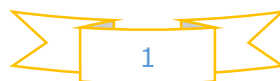
We write 10 as the sum of the squares of two natural numbers:

$$10 = 1 + 9 = 1^2 + 3^2$$

On the number line, take $OA = 3$ units.

Draw $BA = 1$ units, perpendicular to OA . Join OB .

By Pythagoras theorem,



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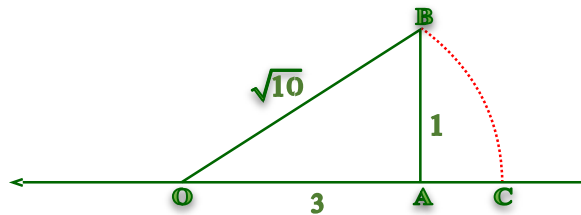
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$$OB = \sqrt{10}$$

Using a compass with centre O and radius OB, draw an arc which intersects the number line at the point C. Then, C corresponds to $\sqrt{10}$.



Presentation of $\sqrt{17}$ on number line:

We write 5 as the sum of the squares of two natural numbers:

$$17 = 1 + 16 = 1^2 + 4^2$$

On the number line, take $OA = 4$ units.

Draw $BA = 1$ units, perpendicular to OA . Join OB .

By Pythagoras theorem,

$$OB = \sqrt{17}$$

Using a compass with centre O and radius OB, draw an arc which intersects the number line at the point C. Then, C corresponds to $\sqrt{17}$.

