

5. The length of the diameter of the circle which touches the x-axis at the point (1, 0) and passes through the point (2, 3) is :

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एक वृत्त जो x-अक्ष को बिंदु (1, 0) पर स्पर्श करता है तथा बिंदु (2, 3) से होकर जाता है, के व्यास की लंबाई है :

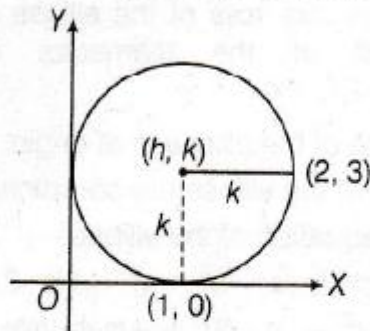
- (1*) $\frac{10}{3}$ (2) $\frac{3}{5}$ (3) $\frac{6}{5}$ (4) $\frac{5}{3}$

Ans:- (1) 10/3

Given

- (i) A circle which touches X-axis at the point (1, 0).
(ii) The circle also passes through the point (2, 3).

To find The length of the diameter of the circle.



Let us assume that the coordinates of the centre of the circle are $C(h, k)$ and its radius is r .

Now, since the circle touches X-axis at (1, 0), hence its radius should be equal to ordinate of centre.

$$\Rightarrow r = k$$

Hence, the equation of the circle is

$$(x - h)^2 + (y - k)^2 = k^2$$

Also, given that the circle passes through points (1, 0) and (2, 3). Hence, substituting them in the equation of the circle, we get

$$(1 - h)^2 + (0 - k)^2 = k^2 \quad \dots(i)$$

$$(2 - h)^2 + (3 - k)^2 = k^2 \quad \dots(ii)$$

From Eq. (i), we get $h = 1$

On substituting in Eq. (ii), we get

$$(2 - 1)^2 + (3 - k)^2 = k^2$$

$$\Rightarrow k = \frac{5}{3}$$

The diameter of the circle is $2k = \frac{10}{3}$