

4. The circle passing through the point $(-1, 0)$ and touching the y -axis at $(0, 2)$ also passes through the point $(-1, 0)$ से होकर जाने वाला और y -अक्ष को $(0, 2)$ पर स्पर्श करने वाला वृत्त निम्न बिन्दु से भी होकर जाता है
- (A) $\left(-\frac{3}{2}, 0\right)$ (B) $\left(-\frac{5}{2}, 2\right)$ (C) $\left(-\frac{3}{2}, \frac{5}{2}\right)$ (D) $(-4, 0)$

[IIT-JEE 2011, Paper-2, (3, -1), 80]

Ans. (D)

Soln:-

Let (h, k) be center of circle.

Circle touches the y -axis.

\therefore Radius of circle = h

Equation of circle-

$$(x-h)^2 + (y-k)^2 = h^2 \dots (1)$$

Since the circle passes through $(0, 2)$

Therefore,

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

$$\Rightarrow (k-2)^2 = 0$$

$$\Rightarrow k = 2$$

Given that the circle also passes through $(-1, 0)$,

Therefore,

$$(-1-h)^2 + 2^2 = h^2$$

$$h^2 + 1 + 2h + 4 = h^2$$

$$h = -5$$

Substituting the value of h and k in eqn(1), we get

$$(x+25)^2+(y-2)^2=(25)^2$$

Now, we can find the point from which the circle passes.

As the point (4,0) satisfy the equation of circle.

Thus, the circle will also pass through the point (-4,0).

Hence the correct answer is (D)(-4,0).