Circles - Class XI

Past Year JEE Questions

Questions

Quetion: 01

The number of integral values of k for which the line, $3x + 4y = k$ intersects the circle, $x^2 + y^2 - 2x - 4y + 4 = 0$ at two distinct points is _____.

Solutions

Solution: 01

Answer

Correct Answer is **9**

Explanation

Circle $x^2 + y^2 - 2x - 4y + 4 = 0$

$\Rightarrow (x - 1)^2 + (y - 2)^2 = 1$

Centre: (1, 2), radius = 1

Line $3x + 4y - k = 0$ intersects the circle at two distinct points.

$\Rightarrow$ distance of centre from the line < radius

$\Rightarrow \left|\frac{3\times1+4\times2-k}{\sqrt{3^2+4^2}}\right| < 1$

$\Rightarrow |11 - k| < 5$

$\Rightarrow 6 < k < 5$

$\Rightarrow k \in \{7, 8, 9, ...15\}$ since $k \in I$

$\therefore$ Total 9 integral value of k.