Circles - Class XI

Past Year JEE Questions

Questions

Quetion: 01

Let the equation $x^2 + y^2 + px + (1 − p)y + 5 = 0$ represent circles of varying radius $r \in (0, 5]$.

Then the number of elements in the set S = {q : q = p^2 and q is an integer} is _____.

Solutions

Solution: 01

Answer

Correct Answer is **61**

Explanation

$r = \sqrt{\frac{p^2}{4} + \frac{(1-p)}{4} - 5} = \frac{\sqrt{2p^2 - 2p - 19}}{2}$

Since, $r \in (0, 5]$

So, $0 < 2p^2 − 2p − 19 \le 100$

$\Rightarrow p \in \left[\frac{1-\sqrt{239}}{2}, \frac{1-\sqrt{39}}{2} \right) \cup \left(\frac{1+\sqrt{39}}{2}, \frac{1+\sqrt{239}}{2} \right]$

so, number of integral values of p^2 is 61.