Previous Year Question with Solution :

Q) If a is an integer lying in [−5, 30], then the probability that the graph y = x² + 2 (a + 4) x − 5a + 64 is strictly above the x-axis is _____.

Soln:

$x^2 + 2(a + 4)x − 5a + 64 \geq 0$

If D ≤ 0, then $(a + 4)^2 − (−5a + 64) < 0$ Or

$a^2 + 13a − 48 < 0$ Or

$(a + 16)(a − 3) < 0$

$\Rightarrow −16 < a < 3 \Leftrightarrow −5 \leq a \leq 2$

Then, the favourable cases are equal to the number of integers in the interval [−5, 2], i.e., 8.

The total number of cases is equal to the number of integers in the interval [−5, 30], i.e., 36.

Hence, the required probability is 8 / 36 = 2 / 9