

Q1. JEE Main 2026 (24 January Shift 1)

The number of the real solutions of the equation: $x|x+3| + |x-1| - 2 = 0$ is

(1) 2

(2) 4

(3) 3

(4) 5

ANSWERS AND SOLUTIONS

1. (3)

1. (3) Critical points: $x = -3$ and $x = 1$.

Case $x < -3$:

$$x^2 + 4x + 1 = 0 \Rightarrow x = -2 \pm \sqrt{3}.$$

Only $x = -2 - \sqrt{3} \approx -3.73$ lies in $(-\infty, -3)$. (1 solution)

Case $-3 \leq x < 1$:

$$x^2 + 2x - 1 = 0 \Rightarrow x = -1 \pm \sqrt{2}.$$

Both $x = -1 + \sqrt{2} \approx 0.41$ and $x = -1 - \sqrt{2} \approx -2.41$ lie in $[-3, 1)$. (2 solutions)

Case $x \geq 1$:

$$x^2 + 4x - 3 = 0 \Rightarrow x = -2 \pm \sqrt{7}.$$

Neither root ≥ 1 . (0 solutions)

Total number of real solutions = 3.