

2. Solve $|x^2 + 4x + 3| + 2x + 5 = 0$

→ CASE-I $x^2 + 4x + 3 > 0 \Rightarrow (x+1)(x+3) > 0$
 $\Rightarrow (x < -3 \text{ or } x > -1)$

$\therefore x^2 + 4x + 3 + 2x + 5 = 0$

$\Rightarrow x^2 + 6x + 8 = 0$

$\Rightarrow (x+4)(x+2) = 0$

$\Rightarrow x = -4, -2$ and $(x < -3 \text{ or } x > -1)$

So, $x = -4$ is the only solution. ①

→ CASE-2 $x^2 + 4x + 3 < 0 \Rightarrow (x+1)(x+3) < 0$
 $\Rightarrow (-3 < x < -1)$

$\therefore -(x^2 + 4x + 3) + 2x + 5 = 0$

$\Rightarrow x^2 + 2x - 2 = 0 \Rightarrow (x+1)^2 = 3$

$\Rightarrow |x+1| = \sqrt{3}$

$\Rightarrow x = -1 - \sqrt{3}, -1 + \sqrt{3}$ but $x \in (-3, -1)$

$\therefore x = -1 - \sqrt{3}$ is the only solution. ②

by ① & ②

$x = -4$ and $(-1 - \sqrt{3})$ are the only solutions