

Question 6: If x satisfies $|x^2-3x+2| + |x-1| = x-3$, then

- (a) $x \in \emptyset$
- (b) $x \in [1, 2]$
- (c) $x \in [3, \infty)$
- (d) $x \in (-\infty, \infty)$

Solution:

$$|x^2-3x+2| + |x-1| = x-3$$

$$\Rightarrow x - 3 \geq 0$$

$$\Rightarrow x \geq 3$$

$$x^2 - 3x + 2 + x - 1 = x - 3$$

$$x^2 - 3x + 4 = 0$$

$$[x - (3/2)]^2 + 4 - 9/4 = 0$$

\Rightarrow no real solution

Hence option a is the answer.