1. The set of real numbers x for which $x^2 - |x+2| + x > 0$ is

(a) $(-\infty,-2) \cup (2,\infty)$ (b) $(-\infty,-\sqrt{2}) \cup (\sqrt{2},\infty)$

(c) $(-\infty,-1) \cup (1,\infty)$ (d) $(\sqrt{2},\infty)$

Sol

CASE - 1 when $x+2 \geq 0 \Rightarrow x \geq -2$

$\therefore x^2 - x - 2 + x > 0 \Rightarrow x^2 - 2 > 0$

$\Rightarrow x < -\sqrt{2}$ or $x > \sqrt{2}$

$\Rightarrow x \in [-2,-\sqrt{2}) \cup (\sqrt{2},\infty)$ — (1)

CASE-2 when $x+2 \leq 0 \Rightarrow x \leq -2$

$\therefore x^2 + x + 2 + x > 0$

$\Rightarrow x^2 + 2x + 2 > 0$

$\Rightarrow (x+1)^2 + 1 > 0 \Rightarrow x \in R$

$x \in (-\infty,-2)$ — (2)

from (1) & (2)

$x \in (-\infty,-\sqrt{2}) \cup (\sqrt{2},\infty)$

Scanned with CamScanner