

Trigonometry Functions - Class XI

Past Year JEE Questions

Questions

Question: 01

The number of solutions of the equation

$$|\cot x| = \cot x + \frac{1}{\sin x} \text{ in the interval } [0, 2\pi] \text{ is}$$

Solutions

Solution: 01

Answer

Correct Answer is **1**

Explanation

Case I : When $\cot x > 0$, $x \in [0, \frac{\pi}{2}] \cup [\pi, \frac{3\pi}{2}]$

$$\cot x = \cot x + \frac{1}{\sin x} \Rightarrow \text{not possible}$$

Case II : When $\cot x < 0$, $x \in [\frac{\pi}{2}, \pi] \cup [\frac{3\pi}{2}, 2\pi]$

$$-\cot x = \cot x + \frac{1}{\sin x}$$

$$\Rightarrow \frac{-2 \cos x}{\sin x} = \frac{1}{\sin x}$$

$$\Rightarrow \cos x = \frac{-1}{2}$$

$$\Rightarrow x = \frac{2\pi}{3}, \frac{4\pi}{3} (\text{Rejected})$$

One solution.