Question1

If $\cos x + \cos^2 x = 1$, then the value of $\sin^2 x + \sin^4 x$ is

KCET 2025

Options:

A. -1

B. 1

C. 0

D. 2

Answer: B

Solution:

$\cos x + \cos^2 x = 1$
$\Rightarrow 1 - \cos^2 x = \cos x \quad \Rightarrow \sin^2 x = \cos x$
$\Rightarrow \sin^2 x + \sin^4 x$
$\Rightarrow \cos x + (\cos x)^2 = 1$

Question2

The trigonometric function $y = \tan x$ in the II quadrant

KCET 2022

Options:

A. decreases from 0 to ∞

B. decreases from $-\infty$ to 0

C. increases from 0 to ∞

D. increases from $-\infty$ to 0

Answer: D

Solution:

Given, function $y = \tan x$

We know that, $\tan x$ is increasing in all the quadrants and for II quadrant the value of x is considered as $(-\infty, 0)$.

Hence, $y = \tan x$ increase from $-\infty$ to 0.

Question3

If $\cos x = |\sin x|$ then, the general solution is

KCET 2019

Options:

A. $x = n\pi + (-1)^n \frac{\pi}{4}, n \in Z$

B. $x = n\pi \pm \frac{\pi}{4}, n \in Z$

C. $x = (2n + 1)\pi \pm \frac{\pi}{4}, n \in Z$

D. $x = 2nx \pm \frac{\pi}{4}, n \in Z$

Answer: D

Solution:

We have, $|\sin x| = \cos x$

$\Rightarrow \sin^2 x = \cos^2 x \Rightarrow 2\cos^2 x = 1$

$\Rightarrow \cos x = \dfrac{1}{\sqrt{2}}$ (since, $\cos x$ can not be negative)

$\Rightarrow x = 2n\pi \pm \dfrac{\pi}{4}$