

Solve $\tan x = \frac{1}{\sqrt{3}}$.

Solution

We have $\tan \frac{\pi}{6} = \frac{1}{\sqrt{3}} \quad \therefore \tan x = \frac{1}{\sqrt{3}} \Rightarrow \tan x = \tan \frac{\pi}{6}$

\therefore The solution is $x = n\pi + \frac{\pi}{6}, n \in \mathbf{Z}$

$$(ii) \sec^2 2x = 1 - \tan 2x$$

Ans) Given:

$$1 + \tan^2 2x = 1 - \tan 2x$$

$$\tan^2 2x + \tan 2x = 0$$

$$\therefore \tan 2x(\tan 2x + 1) = 0$$

$$\Rightarrow \tan 2x = 0 \text{ or } \tan 2x = -1$$

$$\Rightarrow 2x = n\pi \text{ or } 2x = n\pi + \frac{3\pi}{4}$$

$$\text{i.e., } x = \frac{n\pi}{2} \text{ or } x = \frac{n\pi}{2} + \frac{3\pi}{8}$$