



Trigonometric Equations Ex 11.1 Q6(iv)

We have,

$$\sec \theta = 1 + \cot \theta$$

$$\Rightarrow \frac{1}{\sin \theta} = 1 + \frac{\cos \theta}{\sin \theta}$$

$$\Rightarrow 1 = \sin \theta + \cos \theta$$

Divide both side by $\sqrt{2}$, we get,

$$\Rightarrow \frac{1}{\sqrt{2}} \sin \theta + \frac{1}{\sqrt{2}} \cos \theta = \frac{1}{\sqrt{2}}$$

$$\Rightarrow \sin \frac{\pi}{4} \sin \theta + \cos \frac{\pi}{4} \cos \theta = \frac{1}{\sqrt{2}}$$

$$\Rightarrow \cos \left(\theta - \frac{\pi}{4} \right) = \cos \frac{\pi}{4}$$

$$\Rightarrow \theta - \frac{\pi}{4} = 2n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$$

$$\therefore \theta \left(2n\pi + \frac{\pi}{2} \right) \quad \text{or} \quad 2n\pi, n \in \mathbb{Z}$$

Trigonometric Equations Ex 11.1 Q6(v)

$$(\sqrt{3}-1) \cos \theta + (\sqrt{3}+1) \sin \theta = 2$$

Divide on both sides by $2\sqrt{2}$

$$\frac{(\sqrt{3}-1)}{2\sqrt{2}} \cos \theta + \frac{(\sqrt{3}+1)}{2\sqrt{2}} \sin \theta = \frac{1}{\sqrt{2}}$$

$$\sin \left(\theta + \tan^{-1} \left(\frac{\sqrt{3}-1}{\sqrt{3}+1} \right) \right) = \sin \frac{\pi}{4}$$

$$\theta = 2n\pi + \frac{\pi}{3} \text{ or } 2n\pi - \frac{\pi}{6}, n \in \mathbb{Z}$$

Trigonometric Equations Ex 11.1 Q7(i)

$$\cot x + \tan x = 2$$

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

$$\sin 2x = 1$$

$$2x = \frac{(2n+1)\pi}{2}$$

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

Trigonometric Equations Ex 11.1 Q7(ii)

$$\begin{aligned}
2\sin^2 \theta &= 3\cos \theta \\
2-2\cos^2 \theta &= 3\cos \theta \\
2\cos^2 \theta + 3\cos \theta - 2 &= 0 \\
2\cos^2 \theta + 4\cos \theta - \cos \theta - 2 &= 0 \\
(\cos \theta + 2)(2\cos \theta - 1) &= 0 \\
\cos \theta &= -2 \text{ or } \cos \theta = 0.5 \\
\cos \theta &= -2, \text{ never possible} \\
\cos \theta &= 0.5, \theta = 60, 300
\end{aligned}$$

***** END *****