

Trigonometric Equations Ex 11.1 Q2(vii)

We have,

$$tan 2\theta$$
. $tan \theta = 1$
 $\Rightarrow tan 2\theta = \frac{1}{tan \theta}$

$$\Rightarrow$$
 $tan 2\theta = cot \theta$

$$\Rightarrow tan 2\theta = tan \left(\frac{\pi}{2} - \theta \right)$$

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

$$\Rightarrow 3\theta = n\pi + \frac{\pi}{2}, n \in \mathbb{Z}$$

$$\Rightarrow \qquad \theta = \frac{n\pi}{3} + \frac{\pi}{6} \, , n \in Z$$

Trigonometric Equations Ex 11.1 Q2(viii)

$$\tan m\theta + \cot n\theta = 0$$

 $\sin m\theta \sin n\theta + \cos m\theta \cos n\theta = 0$

$$\cos(m-n)\theta = 0$$

$$(m-n)\theta = \left(\frac{2k+1}{2}\right)\pi$$

$$\theta = \left(\frac{2k+1}{2(m-n)}\right)\pi, \ k \in \mathbb{Z}$$

Trigonometric Equations Ex 11.1 Q2(ix)

We have,

$$tan p\theta = cot q\theta$$

$$\Rightarrow tan p\theta = tan \left(\frac{\pi}{2} - q\theta \right)$$

$$\Rightarrow p\theta = n\pi \pm \left(\frac{\pi}{2} - q\theta\right), n \in \mathbb{Z}$$

$$\Rightarrow (p+q)\theta = n\pi + \frac{\pi}{2}, n \in \mathbb{Z}$$

$$\Rightarrow (p+q)\theta = (2n+1)\frac{\pi}{2}, n \in \mathbb{Z}$$

$$\Rightarrow \qquad \theta = \frac{(2n+1)}{(p+q)} \frac{\pi}{2}, n \in \mathbb{Z}$$

Trigonometric Equations Ex 11.1 Q2(x)

$$\begin{aligned} &\sin 2x + \cos x = 0 \\ &2 \sin x \cos x + \cos x = 0 \\ &\cos x (2 \sin x + 1) = 0 \\ &\cos x = 0 \text{ or } 2 \sin x + 1 = 0 \\ &x = (4m - 1) \frac{\pi}{2} \text{ or } \sin x = \frac{-1}{2} \\ &x = (4m - 1) \frac{\pi}{2} \text{ or } x = (4n - 1) \frac{\pi}{6}, \ m, n \in \mathbb{Z} \end{aligned}$$

********* END ********