

Trigonometric Equations Ex 11.1 Q1(i)

We have,

$$\sin \theta = \frac{1}{2}$$

$$\Rightarrow \quad \sin \theta = \sin \frac{\pi}{6}$$

$$\left[\because \sin \frac{\pi}{6} = \frac{1}{2} \right]$$

$$\Rightarrow \qquad \text{the general solution is}$$

$$\theta = n\pi + \left(-1\right)^n \frac{\pi}{6}; n \in \mathbb{Z} \qquad \qquad \left[\because \text{ if } \sin\theta = \sin\alpha \Rightarrow \theta = n\pi + \left(-1\right)^n \alpha \right]$$

Trigonometric Equations Ex 11.1 Q1(ii)

We have,

$$\cos \theta = -\frac{\sqrt{3}}{2}$$

$$\Rightarrow \cos \theta = \cos \left(\pi + \frac{\pi}{6}\right)$$

$$\Rightarrow \cos \theta = \cos \frac{7\pi}{6} \qquad \left[\because \cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2}\right]$$

: the general solution is

$$\theta = 2n\pi \pm \frac{7\pi}{6}, n \in \mathbb{Z}$$

Trigonometric Equations Ex 11.1 Q1(iii)

$$\cos \theta c \theta = -\sqrt{2}$$

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

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

$$\Rightarrow \sin \theta = \sin \left(\pi + \frac{\pi}{4}\right)$$

$$\Rightarrow \sin \theta = \sin \frac{5\pi}{4} \text{ or } \sin \theta = \sin \left(-\frac{\pi}{4}\right)$$

$$\because \sin \left(-\theta\right) = -\sin \theta.$$

$$\therefore \theta = n\pi + \left(-1\right)^{n+1} \frac{\pi}{4}, n \in \mathbb{Z}$$

Trigonometric Equations Ex 11.1 Q1(iv)

We have,