Trigonometric Equations Ex 11.1 Q1(i)

We have,

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

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

$$\Rightarrow$$ the general solution is

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

Trigonometric Equations Ex 11.1 Q1(ii)

We have,

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

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

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

$\therefore$ the general solution is

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

Trigonometric Equations Ex 11.1 Q1(iii)

$$\operatorname{cosec}\theta = -\sqrt{2}$$

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

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

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

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

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

$$\therefore \theta = n\pi + (-1)^{n+1}\frac{\pi}{4}, n \in z$$

Trigonometric Equations Ex 11.1 Q1(iv)

We have,

$$\sec\theta = \sqrt{2}$$

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

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

$$\Rightarrow \ \theta = 2n\pi \pm \frac{\pi}{4}, n \in z$$

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