



Chapter 5 Trigonometric Functions Ex 5.3 Q 1 i

$$\begin{aligned}\sin \frac{5\pi}{3} &= \sin \left(2\pi - \frac{\pi}{3} \right) \\ &= -\sin \frac{\pi}{3} \quad (\because \sin(2\pi - \theta) = -\sin \theta) \\ &= \frac{-\sqrt{3}}{2}\end{aligned}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1 ii

$$\begin{aligned}3060^\circ &= 17\pi \quad (\because \pi = 180^\circ) \\ \therefore \sin 3060^\circ &= \sin 17\pi \\ &= 0 \quad (\because \sin n\pi = 0 \text{ for all } n \in \mathbb{Z})\end{aligned}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1 iii

$$\begin{aligned}\tan \frac{11\pi}{6} &= \tan \left(2\pi - \frac{\pi}{6} \right) \\ &= -\tan \frac{\pi}{6} \quad (\because \tan(2\pi - \theta) = -\tan \theta) \\ &= \frac{-1}{\sqrt{3}}\end{aligned}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.iv

$$\begin{aligned}1125^\circ &= 6\pi + \frac{\pi}{4} \quad (\pi = 180^\circ) \\ \cos(-1125^\circ) &= \cos \left(-\left(6\pi + \frac{\pi}{4} \right) \right) \\ &= \cos \left(6\pi + \frac{\pi}{4} \right) \quad (\because \cos(-\theta) = \cos \theta) \\ &= \cos \left(2 \times 3\pi + \frac{\pi}{4} \right) \\ &= \cos \frac{\pi}{4} \quad (\because \cos(2k\pi + \theta) = \cos \theta, k \in \mathbb{N}) \\ &= \frac{1}{\sqrt{2}}\end{aligned}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.v

$$\begin{aligned}\tan 315^\circ &= \tan \left(2\pi - \frac{\pi}{4} \right) \\ &= -\tan \frac{\pi}{4} \quad (\because \tan(2\pi - \theta) = -\tan \theta) \\ &= -1\end{aligned}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.vi

$$\begin{aligned}
 \sin 510^\circ &= \sin \left(3\pi - \frac{\pi}{6} \right) \\
 &= \sin \frac{\pi}{6} \quad \left(\because 3\pi - \frac{\pi}{6} \text{ lies in second quadrant} \right) \\
 &= \frac{1}{2}
 \end{aligned}$$

Alternative solution

$$\begin{aligned}
 \sin 510^\circ &= \sin \left(3\pi - \frac{\pi}{6} \right) \\
 &= \sin \left(2\pi + \left(\pi - \frac{\pi}{6} \right) \right) \\
 &= \sin \left(\pi - \frac{\pi}{6} \right) \quad \left(\because \sin(2\pi + \theta) = \sin \theta, \text{ as sine is periodic with period } 2\pi \right) \\
 &= \sin \frac{\pi}{6} \quad \left(\because \sin(\pi - \theta) = \sin \theta \right) \\
 &= \frac{1}{2}
 \end{aligned}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.vii

$$\begin{aligned}
 \cos 570^\circ &= \cos \left(3\pi + \frac{\pi}{6} \right) \\
 &= \cos \left(2\pi + \left(\pi + \frac{\pi}{6} \right) \right) \\
 &= \cos \left(\pi + \frac{\pi}{6} \right) \quad \left(\because \cos(2\pi + \theta) = \cos \theta, \text{ as cosine} \right. \\
 &\quad \left. \text{is periodic with period } 2\pi \right) \\
 &= -\cos \frac{\pi}{6} \quad \left(\because \cos(\pi + \theta) = -\cos \theta \right) \\
 &= \frac{-\sqrt{3}}{2}
 \end{aligned}$$

***** END *****