Chapter 5 Trigonometric Functions Ex 5.3 Q 1 i

$$\sin\frac{5\pi}{3} = \sin\left(2\pi - \frac{\pi}{3}\right)$$

$$= -\sin\frac{\pi}{3} \qquad \left(\because \sin(2\pi - \theta) = -\sin\theta\right)$$

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

Chapter 5 Trigonometric Functions Ex 5.3 Q 1 ii

$$3060^\circ = 17\pi \qquad \left(\because \pi = 180^\circ\right)$$

$$\therefore \sin 3060^\circ = \sin 17\pi$$

$$= 0 \qquad (\because \sin n\pi = 0 \text{ for all } n \in z)$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1 iii

$$\tan\frac{11\pi}{6} = \tan\left(2\pi - \frac{\pi}{6}\right)$$

$$= -\tan\frac{\pi}{6} \qquad \left(\because \tan(2\pi - \theta) = -\tan\theta\right)$$

$$= \frac{-1}{\sqrt{3}}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.iv

$$1125^\circ = 6\pi + \frac{\pi}{4}\left(\pi = 180^\circ\right)$$

$$\cos\left(-1125^\circ\right) = \cos\left(-\left(6\pi + \frac{\pi}{4}\right)\right)$$

$$= \cos\left(6\pi + \frac{\pi}{4}\right) \qquad \left(\because \cos(-\theta) = \cos\theta\right)$$

$$= \cos\left(2 \times 3\pi + \frac{\pi}{4}\right)$$

$$= \cos\frac{\pi}{4} \qquad \left(\because \cos(2k\pi + \theta) = \cos\theta, k \in n\right)$$

$$= \frac{1}{\sqrt{2}}$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.v

$$\tan 315^\circ = \tan\left(2\pi - \frac{\pi}{4}\right)$$

$$= -\tan\frac{\pi}{4} \qquad \left(\because \tan(2\pi - \theta) = -\tan\theta\right)$$

$$= -1$$

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.vi

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

Alternative solution

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

Chapter 5 Trigonometric Functions Ex 5.3 Q 1.vii

$$\cos 570^\circ = \cos\left(3\pi + \frac{\pi}{6}\right)$$
$$= \cos\left(2\pi + \left(\pi + \frac{\pi}{6}\right)\right)$$
$$= \cos\left(\pi + \frac{\pi}{6}\right) \qquad \left(\because \cos(2\pi + \theta) = \cos\theta, \text{ as cosine is periodoc with period } 2\pi\right)$$
$$= -\cos\frac{\pi}{6} \qquad \left(\because \cos(\pi + \theta) = -\cos\theta\right)$$
$$= \frac{-\sqrt{3}}{2}$$

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