

Date Planned : __ / __ / __	Daily Tutorial Sheet – 3	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 1	Exact Duration: _____

- 31.** If $A + B + C = \pi$, prove that : $\sin^2 A + \sin^2 B + \sin^2 C = 2(1 + \cos A \cos B \cos C)$
- 32.** If $A + B + C = \pi$, prove that : $\cot A \cot B \cot C = \cot A + \cot B + \cot C - \operatorname{cosec} A \operatorname{cosec} B \operatorname{cosec} C$
- 33.** The expression $4 \cos^4 x - 2 \cos 2x - \frac{1}{2} \cos 4x$ when simplified reduces to :
- (A) $\frac{2}{3}$ (B) $\frac{3}{2}$ (C) $-\frac{2}{3}$ (D) $-\frac{3}{2}$
- 34.** Solve for θ : $\cos 2\theta = (\sqrt{2} + 1) \left(\cos \theta - \frac{1}{\sqrt{2}} \right)$.
- 35.** Solve for θ : $\tan p\theta = \cot q\theta$
- 36.** Solve for θ : $\cos \theta + \sin \theta = \cos 2\theta + \sin 2\theta$
- 37.** Solve for θ : $\sin \theta + \sin 5\theta = \sin 3\theta$ where $0 \leq \theta \leq \pi$
- 38.** Solve for x : $\sin^3 x + \cos x \sin x + \cos^3 x = 1$
- 39.** Solve for x : $\cos 3x \cos^3 x + \sin 3x \sin^3 x = 0$ 
- 40.** Solve for x : $\sin 2x + \sin x + \cos 2x + \cos x + 1 = 0$
- 41.** The most general solution of the equation $\sqrt{3} \cos x + \sin x = \sqrt{2}$ is: 
- (A) $2n\pi + \frac{5\pi}{12}$ (B) $2n\pi \pm \frac{\pi}{4} + \frac{\pi}{6}$ (C) $2n\pi - \frac{\pi}{12}$ (D) None of these
- 42.** The value of the expression $\cos^3 \theta + \cos^3 (120^\circ + \theta) + \cos^3 (240^\circ + \theta)$ is:
- (A) $\cos 3\theta$ (B) $\frac{1}{4} \cos 3\theta$ (C) $\frac{3}{4} \cos 3\theta$ (D) None of these
- 43.** If $3 \tan \theta \tan \phi = 1$, then $\frac{\cos(\theta - \phi)}{\cos(\theta + \phi)}$ is:
- (A) $\frac{1}{2}$ (B) 2 (C) $\frac{1}{3}$ (D) 3
- 44.** The most general solution of $\tan \theta = -1$ and $\cos \theta = \frac{1}{\sqrt{2}}$ is:
- (A) $n\pi + \frac{7\pi}{4}, n \in I$ (B) $n\pi + (-1)^n \frac{7\pi}{4}, n \in I$
- (C) $2n\pi + \frac{7\pi}{4}, n \in I$ (D) None of these
- 45.** The solution set of the equation $4 \sin \theta \cdot \cos \theta - 2 \cos \theta - 2\sqrt{3} \sin \theta + \sqrt{3} = 0$ in the interval $(0, 2\pi)$ is :
- (A) $\left\{ \frac{3\pi}{4}, \frac{7\pi}{4} \right\}$ (B) $\left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\}$ (C) $\left\{ \frac{3\pi}{4}, \pi, \frac{\pi}{3}, \frac{5\pi}{3} \right\}$ (D) $\left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{11\pi}{6} \right\}$