

Date Planned : __ / __ / __	Daily Tutorial Sheet – 4	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 1	Exact Duration: _____

46. If α and β be acute angles and $\cos 2\alpha = \frac{3\cos 2\beta - 1}{3 - \cos 2\beta}$, then $\tan \alpha$ is:
- (A) $\tan \beta$ (B) $2 \tan \beta$ (C) $\sqrt{2} \tan \beta$ (D) None of these
- *47. If α and β are the solutions of $a \cos \theta + b \sin \theta = c$, then:
- (A) $\sin \alpha + \sin \beta = \frac{2bc}{a^2 + b^2}$ (B) $\sin \alpha \sin \beta = \frac{c^2 - a^2}{a^2 + b^2}$
- (C) $\sin \alpha + \sin \beta = \frac{2ac}{b^2 + c^2}$ (D) $\sin \alpha + \sin \beta = \frac{c}{a^2 + b^2}$
48. If $\sin(y + z - x)$, $\sin(z + x - y)$ and $\sin(x + y - z)$ are in A.P. then $\tan x$, $\tan y$ and $\tan z$ are in: 
- (A) A.P. (B) G.P. (C) H.P. (D) None of these
49. Which of the following is correct?
- (A) $\sin 1^\circ > \sin 1$ (B) $\sin 1^\circ < \sin 1$ (C) $\sin 1^\circ = \sin 1$ (D) $\sin 1^\circ = \frac{\pi}{180} \sin 1$
- *50. If $\cos(\theta - \phi)$, $\cos \theta$ and $\cos(\theta + \phi)$ are in harmonic progression then $\cos \theta \sec \frac{\phi}{2}$ is: 
- (A) 2 (B) $\sqrt{2}$ (C) $-\sqrt{2}$ (D) None of these
51. The value of $2 \sin^2 \theta + 4 \cos(\theta + \alpha) \cdot \sin \alpha \cdot \sin \theta + \cos 2(\alpha + \theta)$ is:
- (A) $\cos \theta + \cos \alpha$ (B) independent of θ
- (C) independent of α (D) none of these
52. If $\sin^6 \theta + \cos^6 \theta + k \cos^2 2\theta = 1$, then k is equal to:
- (A) $\frac{1}{2} \tan^2 2\theta$ (B) $\frac{1}{4} \tan^2 2\theta$ (C) $4 \cot^2 2\theta$ (D) $\frac{3}{4} \tan^2 2\theta$
53. Which of the following is rational number?
- (A) $\sin 15^\circ$ (B) $\cos 15^\circ$ (C) $\sin 15^\circ \cdot \cos 15^\circ$ (D) $\sin 15^\circ \cdot \cos 75^\circ$
54. If $\sin \theta_1 + \sin \theta_2 + \sin \theta_3 = 3$, then $\cos \theta_1 + \cos \theta_2 + \cos \theta_3$ is equal to:
- (A) 3 (B) 2 (C) 1 (D) 0
- *55. The exhaustive solution of the equation $\sin 2x + \sin 4x = 2 \sin 3x$ is:
- (A) $x = \frac{n\pi}{3}$ (B) $x = n\pi$ (C) $x = 2n\pi$ (D) None of these

- 56.** The general solution of $8 \tan^2 \frac{x}{2} = 1 + \sec x$ is:
- (A) $x = 2n\pi \pm \cos^{-1}\left(\frac{-1}{3}\right)$ (B) $x = 2n\pi \pm \frac{\pi}{6}$
- (C) $x = 2n\pi \pm \cos^{-1}\left(\frac{1}{3}\right)$ (D) None of these
- 57.** Number of solutions of the given equation $\tan x + \sec x = 2 \cos x$ lying in the interval $[0, 2\pi]$ is:
- (A) 0 (B) 1 (C) 2 (D) 3
- *58.** The solution of $4 \sin^4 x + \cos^4 x = 1$ is:
- (A) $(2n+1)\frac{\pi}{2}$ (B) $n\pi$ (C) $n\pi \pm \sin^{-1}\sqrt{\frac{2}{5}}$ (D) None of these
- 59.** ABC is a triangle such that $\sin(2A+B) = \sin(C-A) = -\sin(B+2C) = \frac{1}{2}$. If A, B and C are in A.P. then the value of A, B and C are:
- (A) $45^\circ, 60^\circ, 75^\circ$ (B) $30^\circ, 60^\circ, 90^\circ$ (C) $20^\circ, 60^\circ, 100^\circ$ (D) None of these
- 60.** If $\sum_{i=1}^n \cos \theta_i = n$, then $\sum_{i=1}^n \sin \theta_i$ is:
- (A) $n-1$ (B) 0 (C) n (D) $n+1$