

Date Planned : __ / __ / __	Daily Tutorial Sheet – 10	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 2	Exact Duration: _____

121. If $\alpha, \beta, \gamma, \delta$ satisfy the equation $\tan\left(x + \frac{\pi}{4}\right) = 3 \tan 3x$, then $\tan \alpha + \tan \beta + \tan \gamma + \tan \delta$ is equal to:

- (A) -1 (B) 1/3 (C) 0 (D) 2

122. In any triangle ABC, not right angled, $\sum \cos A \operatorname{cosec} B \operatorname{cosec} C$ is equal to:

- (A) 1 (B) 2 (C) 3 (D) None of these

123. If $P_n = \cos^n \theta + \sin^n \theta$, then $P_n - P_{n-2} = kP_{n-4}$, where k is equal to:

- (A) 1 (B) $-\sin^2 \theta \cos^2 \theta$ (C) $\sin^2 \theta$ (D) $\cos^2 \theta$

124. If $\tan^2 x + \sec x - a = 0$ has at least one solution, then complete set of values of a is :

- (A) $(-\infty, 1]$ (B) $[-1, \infty)$ (C) $\left[\frac{9}{4}, \infty\right)$ (D) $[1, \infty)$

125. $\frac{1}{2} \tan \frac{\alpha}{2} + \frac{1}{4} \tan \frac{\alpha}{4} + \frac{1}{8} \tan \frac{\alpha}{8} + \dots + \frac{1}{2^n} \tan \frac{\alpha}{2^n} + \cot \alpha$ is equal to:

- (A) $\frac{1}{2^n} \tan \frac{\alpha}{2^n}$ (B) $\frac{1}{2^n} \cot \frac{\alpha}{2^n}$ (C) $\frac{1}{2^{n-1}} \tan \frac{\alpha}{2^n}$ (D) $\frac{1}{2^{n-1}} \cot \frac{\alpha}{2^n}$

126. If $\sin^3 x \sin 3x = \sum_{m=0}^6 C_m \cos^m x$, where $C_0, C_1, C_2, \dots, C_6$ are constants, then :

- (A) $C_0 + C_2 + C_4 + C_6 = 0$ (B) $C_1 + C_3 + C_5 = -1$
(C) $2C_2 - 4C_6 = 0$ (D) $C_4 + 2C_6 = 0$

127. The ratio of the greatest value of $2 - \cos x + \sin^2 x$ to its least value is :

- (A) 7/4 (B) 11/4 (C) 13/4 (D) None of these

128. The number of distinct solutions of $\sin 5\theta \cdot \cos 3\theta = \sin 9\theta \cdot \cos 7\theta$ in $[0, \pi/2]$ is :

- (A) 4 (B) 5 (C) 8 (D) 9

129. If $|\tan x| \leq 1$ and $x \in [-\pi, \pi]$ then the exhaustive solution set for x is :

- (A) $\left[-\pi, -\frac{3\pi}{4}\right] \cup \left[-\frac{\pi}{4}, \frac{\pi}{4}\right] \cup \left[\frac{3\pi}{4}, \pi\right]$ (B) $\left[-\frac{\pi}{4}, \frac{\pi}{4}\right] \cup \left[\frac{3\pi}{4}, \pi\right]$
(C) $\left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$ (D) None of these

130. If $(1 + \tan 1^\circ) \cdot (1 + \tan 2^\circ) \cdot (1 + \tan 3^\circ) \cdot \dots \cdot (1 + \tan 45^\circ) = 2^n$, then 'n' is equal to :

- (A) 16 (B) 23 (C) 30 (D) None of these