

Date Planned : __ / __ / __	Daily Tutorial Sheet – 9	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 2	Exact Duration: _____

111. If $\max \{5 \sin \theta + 3 \sin (\theta - \alpha)\} = 7$, then the set of possible value of α is: ($\theta \in R$) ▶
- (A) $\left\{x : x = 2n\pi \pm \frac{\pi}{3}, n \in I\right\}$ (B) $\left\{x : x = 2n\pi \pm \frac{2\pi}{3}, n \in I\right\}$
- (C) $\left[\frac{\pi}{3}, \frac{2\pi}{3}\right]$ (D) None of these
112. Total number of integral values of 'n' so that $\sin x (\sin x + \cos x) = n$ has at least one solution, is:
- (A) 2 (B) 1 (C) 3 (D) zero
113. The value of $\sum_{r=0}^7 \tan^2 \frac{\pi r}{16}$ is equal to: ▶
- (A) 28 (B) 35 (C) 21 (D) None of these
114. One root of the equation $\cos x - x + \frac{1}{2} = 0$ lies in the interval: ▶
- (A) $(0, \pi/2)$ (B) $(-\pi/2, 0)$ (C) $(\pi/2, \pi)$ (D) $(\pi, 3\pi/2)$
115. If $\frac{x}{\tan(\theta+\alpha)} = \frac{y}{\tan(\theta+\beta)} = \frac{z}{\tan(\theta+\gamma)}$, then $\sum \frac{x+y}{x-y} \sin^2(\alpha-\beta)$ is equal to: ▶
- (A) 1 (B) -1 (C) 0 (D) None of these
116. Statement-1: Number of solutions of the equation $\cos(x-1) = \frac{|x-1|}{10}$ are 6.
Statement-2: Number of solutions of the equation $f(x) = g(x)$ is equal to the number of points of intersection of graph $y = f(x)$ and $y = g(x)$
- (A) Statement-1 is True, Statement-2 is True and Statement-2 is a correct explanation for Statement-1.
(B) Statement-1 is True, Statement-2 is True and Statement-2 is NOT a correct explanation for Statement-1.
(C) Statement-1 is True, Statement-2 is False.
(D) Statement-1 is False, Statement-2 is True.
117. If $\tan \alpha = \frac{1}{\sqrt{x(x^2+x+1)}}$, $\tan \beta = \frac{\sqrt{x}}{\sqrt{x^2+x+1}}$ and $\tan \gamma = \sqrt{x^{-3}+x^{-2}+x^{-1}}$, then $\alpha + \beta$ is :
- (A) γ (B) 2γ (C) $-\gamma$ (D) None of these
118. If $4n\alpha = \pi$, then the value of $\tan \alpha \cdot \tan 2\alpha \cdot \tan 3\alpha \dots \tan (2n-2)\alpha \tan (2n-1)\alpha$ is :
- (A) 0 (B) 1 (C) -1 (D) None of these
119. If $\cos(\alpha+\beta)\sin(\gamma+\delta) = \cos(\alpha-\beta)\sin(\gamma-\delta)$, then the value of $\cot \alpha \cot \beta \cot \gamma$ is :
- (A) $\cot \alpha$ (B) $\cot \beta$ (C) $\cot \delta$ (D) $\cot (\alpha + \beta + \gamma + \delta)$
120. Let A and B denote the statements A : $\cos \alpha + \cos \beta + \cos \gamma = 0$ and B : $\sin \alpha + \sin \beta + \sin \gamma = 0$.
If $\cos(\beta-\gamma) + \cos(\gamma-\alpha) + \cos(\alpha-\beta) = -\frac{3}{2}$, then : ▶
- (A) A is false and B is true (B) Both A and B are true
(C) Both A and B are false (D) A is true and B is false