

Trigonometric Identities & Equations

Date Planned : ___ / ___ / ___	Daily Tutorial Sheet – 7	Expected Duration : 90 Min
Actual Date of Attempt : ___ / ___ / ___	Level – 2	Exact Duration: _____

91. If $\sec(\theta + \alpha) + \sec(\theta - \alpha) = 2 \sec \theta$, $\cos \theta$ is equal to:

- (A) $\pm \sqrt{2} \sin \frac{\alpha}{2}$ (B) $\pm \sqrt{2} \tan \frac{\alpha}{2}$ (C) $\pm \sqrt{2} \cos \frac{\alpha}{2}$ (D) $\pm \sqrt{2} \sec \frac{\alpha}{2}$

92. The minimum and the maximum values of expression $y = \cos \theta \left(\sin \theta + \sqrt{\sin^2 \theta + \sin^2 \alpha} \right)$ is: 

- (A) $-\sqrt{1 + \sin^2 \alpha}$ and $\sqrt{1 - \sin^2 \alpha}$ (B) $-\sqrt{1 + \sin^2 \alpha}$ and $\sqrt{1 + \sin^2 \alpha}$
(C) $1 - \sqrt{1 + \sin^2 \alpha}$ and $1 + \sqrt{1 + \sin^2 \alpha}$ (D) None of these

93. If $x + y + z = xyz$, then show that $\frac{2x}{1-x^2} + \frac{2y}{1-y^2} + \frac{2z}{1-z^2} = \frac{8xyz}{(1-x^2)(1-y^2)(1-z^2)}$. 

94. If $xy + yz + zx = 1$, ($x, y, z \geq 0$) then prove that $\frac{x}{1+x^2} + \frac{y}{1+y^2} + \frac{z}{1+z^2} = \frac{2}{\sqrt{(1+x^2)(1+y^2)(1+z^2)}}$

95. If $y + \cos x = \sin x$ has a real solution, then :

- (A) $y \leq -\sqrt{2}$ (B) $-\sqrt{2} \leq y \leq \sqrt{2}$ (C) $y > \sqrt{2}$ (D) None of these

96. If $2 \cos x < \sqrt{3}$ and $x \in [-\pi, \pi]$ then the solution set for x is : 

- (A) $\left[-\pi, -\frac{\pi}{6}\right) \cup \left(\frac{\pi}{6}, \pi\right]$ (B) $\left[-\frac{\pi}{6}, \frac{\pi}{6}\right]$
(C) $\left[-\pi, -\frac{\pi}{6}\right] \cup \left[\frac{\pi}{6}, \pi\right]$ (D) None of these

97. If $2 \sin x + 1 \geq 0$ and $x \in [0, 2\pi]$ then solution set for x is:

- (A) $\left[0, \frac{7\pi}{6}\right]$ (B) $\left[0, \frac{7\pi}{6}\right] \cup \left[\frac{11\pi}{6}, 2\pi\right]$
(C) $\left[\frac{11\pi}{6}, 2\pi\right]$ (D) None of these

98. The value of $\frac{\cos 6\theta + 6 \cos 4\theta + 15 \cos 2\theta + 10}{\cos 5\theta + 5 \cos 3\theta + 10 \cos \theta}$ is:

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

99. The solution of the equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ is: 

- (A) $x = 0$ (B) $x = \sin^{-1} [\log (2 - \sqrt{5})]$
(C) no real solution (D) none of these

*100. The values of x , $0 \leq x \leq \frac{\pi}{2}$ which satisfy the equation $81^{\sin^2 x} + 81^{\cos^2 x} = 30$ are:

- (A) $\frac{\pi}{3}$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{6}$ (D) $\frac{7\pi}{18}$