

Date Planned : __ / __ / __	Daily Tutorial Sheet – 2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 1	Exact Duration: _____

16. If $A + B + C = \pi$, prove that : $\cos A - \cos B - \cos C = 1 - 4 \sin A/2 \cos B/2 \cos C/2$.
17. Show that: $\sec\left(\frac{\pi}{4} + \theta\right) \sec\left(\frac{\pi}{4} - \theta\right) = 2 \sec 2\theta$
18. Show that: $2 \cos \theta = \sqrt{2 + \sqrt{2 + 2 \cos 4\theta}}$, $\theta \in \left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$
19. Prove : $\sin 10^\circ \sin 50^\circ \sin 70^\circ = 1/8$
20. Prove : $\sin 20^\circ \sin 40^\circ \sin 80^\circ = \sqrt{3}/8$
21. Prove : $\cos 15^\circ - \sin 15^\circ = 1/\sqrt{2}$
22. Prove : $\frac{\cos 9^\circ + \sin 9^\circ}{\cos 9^\circ - \sin 9^\circ} = \tan 54^\circ$
23. Prove : $4 \sin \pi/10 \sin 13\pi/10 = -1$.
24. If $\sec \theta = \sqrt{2}$ and $\frac{3\pi}{2} < \theta < 2\pi$, find the value of $\frac{1 + \tan \theta + \operatorname{cosec} \theta}{1 + \sec \theta - \operatorname{cosec} \theta}$.
- *25. If $y = \frac{\sin 3x}{\sin x}$, $x \neq n\pi$, then: ▶
- (A) y is always more than or equal to -1 (B) y is never more than 3
(C) y is always less than 3 (D) y is always more than -1
26. The maximum value of $1 + \sin\left(\frac{\pi}{4} + \theta\right) + 2 \cos\left(\frac{\pi}{4} - \theta\right)$ for all real values of θ is:
- (A) 4 (B) $3\sqrt{3}$ (C) $2\sqrt{2}$ (D) 2
27. The minimum value of $\cos 2\theta + \cos \theta$ for all real values of θ is:
- (A) $-2\sqrt{2}$ (B) $\frac{3\sqrt{3}}{2}$ (C) $-\frac{9}{8}$ (D) $-\frac{9}{16}$
28. If $A = \cos^2 \theta + \sin^4 \theta$, then for all values of θ . ▶
- (A) $1 \leq A \leq 2$ (B) $\frac{13}{16} \leq A \leq 1$ (C) $\frac{3}{4} \leq A \leq \frac{13}{16}$ (D) $\frac{3}{4} \leq A \leq 1$
29. If $A + B + C = \pi$, prove that : $\cos 2A + \cos 2B + \cos 2C = -1 - 4 \cos A \cos B \cos C$.
30. If $A + B + C = \pi$, prove that : $\cos 2A - \cos 2B - \cos 2C = -1 + 4 \cos A \sin B \sin C$.