

# INTERNATIONAL INDIAN SCHOOL, RIYADH

**CLASS: X**

**TOPIC: TRIGONOMETRY**

1. If  $\cot\theta = 15/8$ , evaluate :  $\frac{(2 + 2\sin\theta)(1 - \sin\theta)}{(1 + \cos\theta)(2 - 2\cos\theta)}$  (225/64)
2. If  $\sin A = \frac{1}{2}$ , find the value of  $3 \cos A - 4 \cos^3 A$
3. If  $\sqrt{3} \tan\theta = 3 \sin\theta$ , find the value of  $\sin^2\theta - \cos^2\theta$
4. Evaluate:  $\tan^2 60^\circ - 2 \cos^2 60^\circ - \frac{3}{4} \sin^2 45^\circ - 4 \sin^2 30^\circ$  (9/8)
5. If  $\sin 2x = \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$ , find x (15)
6. If  $A = B = 30^\circ$ , verify that :  
 $\sin(A + B) = \sin A \cos B + \cos A \sin B$
7. If  $\sec^2\theta (1 + \sin\theta) (1 - \sin\theta) = k$ , find the value of k (k = 1)
8. Evaluate:  $\sec(90 - \theta)\operatorname{cosec}\theta - \tan(90 - \theta)\cot\theta + \frac{\cos^2 35^\circ + \cos^2 55^\circ}{\tan 5^\circ \tan 15^\circ \tan 45^\circ \tan 75^\circ \tan 85^\circ}$  (2)
9. Find the value of:  
 $\frac{2 \sin 68^\circ}{\cos 22^\circ} - \frac{2 \cot 15^\circ}{5 \tan 75^\circ} - \frac{3 \tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5}$  (1)
10. If  $\cos(40^\circ + x) = \sin 30^\circ$ , find the value of x (20^\circ)
11.  $\sin 4A = \cos(A - 20^\circ)$ , where 4A is an acute angle, find the value of A (22^\circ)
12. Find the value of  $\theta$  in  $2 \cos 3\theta = 1$  (20^\circ)
13. Solve for  $\theta$ :  $2 \sin^2\theta = \frac{1}{2}$  (30^\circ)
14. Find the acute angles A and B,  $A > B$ , if  $\sin(A + 2B) = \sqrt{3}/2$  and  $\cos(A + 4B) = 0$  (30^\circ, 15^\circ)
15. If  $\tan(A + B) = \sqrt{3}$ ,  $\tan(A - B) = 1$ ,  $0^\circ < A + B \leq 90^\circ$ ,  $a > b$ , then find A and B (52.5, 7.5)
16. Express  $\cos A$  in terms of  $\tan A$
17. Find the value of  $\sin 60^\circ$  and  $\sec 30^\circ$  geometrically
18. If  $x = a \sin\theta$ ,  $y = b \tan\theta$ . Prove that  $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$
19. Prove that:  $\frac{1}{1 + \sin\theta} + \frac{1}{1 - \sin\theta} = 2 \sec^2\theta$
20. Prove:  $\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \frac{\cos A}{1 - \sin A}$
21. Prove that  $\sin(90 - \theta) \cos(90 - \theta) = \frac{\tan\theta}{1 + \tan^2\theta}$
22. Prove that  $(\sec^4\theta - \sec^2\theta) = (\tan^2\theta + \tan^4\theta)$
23. Prove that  $(\operatorname{cosec}\theta - \cot\theta)^2 = \frac{1 - \cos\theta}{1 + \cos\theta}$
24. Prove that  $\frac{1}{(\sec\theta - \tan\theta)} - \frac{1}{\cos\theta} = \frac{1}{\cos\theta} - \frac{1}{(\sec\theta + \tan\theta)}$
25. Prove that  $\sqrt{\frac{1 + \sin A}{1 - \sin A}} = \operatorname{Sec}A + \tan A$
28. If  $\sec\theta + \tan\theta = p$ , prove that  $\sin\theta = \frac{p^2 - 1}{p^2 + 1}$
29. If  $x = \cot A + \cos A$  and  $Y = \cot A - \cos A$ . Prove that  $\left(\frac{x - y}{x + y}\right)^2 + \left(\frac{x - y}{2}\right)^2 = 1$
30. If  $x = a \sec\theta + b \tan\theta$  and  $y = a \tan\theta + b \sec\theta$  prove that  $x^2 - y^2 = a^2 - b^2$

