

**SELF ASSESSMENT TEST -2****CLASS 10+1****TRIGONOMETRIC FUNCTIONS**

1. Evaluate; (a)  $\cos 75^\circ$  (b)  $\sin 15^\circ$
2. Prove that  $\tan 15^\circ + \cot 15^\circ = 4$ .
3. Prove that  $\cot 2A + \tan A = \operatorname{cosec} 2A$ .
4. Prove that  $\tan 75^\circ - \tan 30^\circ - \tan 75^\circ \cdot \tan 30^\circ = 1$
5. Prove that  $\tan 3A - \tan 2A - \tan A = \tan A \tan 2A \tan 3A$ .
6. Prove that  $\tan 65^\circ = \tan 25^\circ + 2 \tan 40^\circ$
7. Prove that  $\frac{\cos 29^\circ + \sin 29^\circ}{\cos 29^\circ - \sin 29^\circ} = \tan 74^\circ$
8. If  $A - B = 45^\circ$ , show that  $(1 + \tan A)(1 + \tan B) = 2 \tan A$
9. If  $\tan A = k \tan B$ , then prove that  $\sin(A-B) = \frac{k-1}{k+1} \sin(A+B)$
10. Prove that  $\tan\left(\frac{\pi}{4} + \theta\right) \tan\left(\frac{3\pi}{4} + \theta\right) = -1$
11. Find the value of  $\sin(A+B)$ ,  $\cos(A-B)$ ,  $\tan(A-B)$  given that  $\tan A = 2$ ,  $\cos B = -\frac{3}{5}$  where  $180^\circ < A < 270^\circ$  and  $90^\circ < A < 180^\circ$ .
12. Prove that  $\sin^2\left(\frac{\pi}{8} + \frac{A}{2}\right) - \sin^2\left(\frac{\pi}{8} - \frac{A}{2}\right) = \frac{1}{\sqrt{2}} \sin A$

13. Evaluate  $\cos^2\left(\frac{\pi}{4}+A\right)-\sin^2\left(\frac{\pi}{4}-A\right)$

14. Prove that  $\tan\left(\frac{13\pi}{12}\right) = 2 - \sqrt{3}$ .

15. If  $\cos A = \frac{1}{7}$  and  $\cos B = \frac{13}{14}$  ( A, B being positive acute ), prove that  $A - B = 60^\circ$

16. If  $\tan A = \frac{a}{a+1}$  and  $\tan B = \frac{1}{2a+1}$ , prove  $A + B = 45^\circ$

17. If  $\tan A + \tan B = a$  and  $\cot A + \cot B = b$  then prove that

$$\cot(A+B) = \left(\frac{1}{a} - \frac{1}{b}\right).$$

18. Prove that  $\cos A - \sin A = \sqrt{2} \cos\left(A + \frac{\pi}{4}\right)$

19. If  $\tan(A+B) = p$  and  $\tan(A-B) = q$  then prove  $\tan 2A = \frac{p+q}{1-pq}$

20. If  $\cot A \cot B = 2$ , show  $\frac{\cos(A+B)}{\cos(A-B)} = \frac{1}{3}$

21. If  $\frac{\sin(A+B)}{\sin(A-B)} = \frac{a+b}{a-b}$ , then show that  $\frac{\tan A}{\tan B} = \frac{a}{b}$

22. Prove that :  $\cos 2A \cos 2B + \sin^2(A-B) - \sin^2(A+B) = \cos 2(A+B)$

23. If  $2 \tan B + \cot B = \tan A$ , prove that  $\cot B = 2 \tan(A-B)$

24. If  $\cos(A+B) \sin(C+D) = \cos(A-B) \sin(C-D)$ , prove that

$$\cot A \cot B \cot C = \cot D$$

25. Prove that  $\frac{\cos^2 33^\circ - \cos^2 57^\circ}{\sin^2 \frac{21^\circ}{2} - \sin^2 \frac{69^\circ}{2}} = -\sqrt{2}$