

XII ASSIGNMENT INVERSE TRIGONOMETRIC FUNCTION

1. Find the principal values of the following

(a) $\sin^{-1} - 1$ (b) $\sec^{-1} \frac{2}{\sqrt{3}}$ (c) $\sin^{-1} - \frac{\sqrt{3}}{2}$.

2. Evaluate the following

(a) $\sin^{-1} \sin \frac{5\pi}{6}$ (b) $\cos [\cos^{-1} (-\frac{\sqrt{3}}{2}) + \frac{\pi}{6}]$

3. Prove that $\cos^{-1} x = 2 \sin^{-1} \sqrt{\frac{1-x}{2}}$

4. Prove that $\tan^{-1} x = \sin^{-1} \frac{x}{\sqrt{x^2+1}}$

5. Simplify Prove that $\cos^{-1} x = 2 \sin^{-1} \sqrt{\frac{1-x}{2}}$

6. Write in the simplest form

$$\tan^{-1} \frac{\sqrt{1+x^2} - 1}{x}$$

7. Write in the simplest form

$$\tan^{-1} \frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}}$$

8. Write the following in the simplest form

$$\sin^{-1} [x \sqrt{1-x} - \sqrt{x} \sqrt{1-x^2}]$$

9. Prove that $\tan^{-1} 5 - \tan^{-1} 3 + \tan^{-1} \frac{7}{9} = \frac{\pi}{4}$.

10. Prove that $\tan^{-1} \frac{1}{4} - \tan^{-1} \frac{2}{9} = \frac{1}{2} \cos^{-1} \frac{3}{5}$.

11. Prove that $\tan^{-1} \frac{63}{16} - \sin^{-1} \frac{5}{13} = \cos^{-1} \frac{3}{5}$.

12. Prove that $\tan^{-1} \frac{27}{11} - \cos^{-1} \frac{4}{5} = \tan^{-1} \frac{3}{5}$.

13. Solve for x ,

$$\tan^{-1} \frac{1}{1+2x} - \tan^{-1} \frac{1}{4x+1} = \tan^{-1} \frac{2}{x^2} .$$

14. Solve for x ,

$$\tan^{-1} \frac{x-1}{x+1} - \tan^{-1} \frac{2x-1}{2x+1} = \tan^{-1} \frac{23}{36} .$$

15. If $\cos^{-1} \frac{x}{a} + \cos^{-1} \frac{y}{b} = \theta$ then Prove that $\frac{x^2}{a^2} - \frac{2xy}{ab} \cos \theta + \frac{y^2}{b^2} = (\sin \theta)^2$

