Inverse Trigonometry Function 2

1. Prove $\cot(\cos^{-1}x) = \frac{x}{\sqrt{1-x^2}}, |x| < 1$

2. Solve $\sin\left(\cos^{-1}\frac{2}{\sqrt{5}} + \sin^{-1}\frac{1}{\sqrt{10}}\right)$

3. Solve $\tan\left[\cos^{-1}\left(\frac{4}{5}\right) + \sin^{-1}\left(-\frac{3}{5}\right)\right]$

4. Solve $\cos\left[\cos^{-1}\left(\frac{4}{5}\right) + \cos^{-1}\left(-\frac{5}{13}\right)\right]$

5. Solve $\sin[\tan^{-1}5 + \csc^{-1}(-3)]$

6. Solve $\sin\left[2\tan^{-1}\left(-\frac{3}{4}\right)\right]$

7. Solve $\sin^{-1}\left(\sin\frac{5\pi}{6}\right)$

8. Solve $\cos^{-1}\left(\cos\frac{4\pi}{3}\right)$

9. Solve $\sin^{-1}\left(\sin\frac{2\pi}{3}\right) + \tan^{-1}\left(\tan\frac{3\pi}{5}\right)$

10. Solve $\sin^{-1}0.4 + \cos^{-1}0.4$

11. Solve $\tan^{-1}\frac{1}{3} + \tan^{-1}\frac{1}{2}$

12. Solve $\tan^{-1}1 + \tan^{-1}2 + \tan^{-1}3$

13. Solve $\sin^{-1}x = \cos^{-1}x$, for $0 \leq x \leq 1$

14. Solve $\tan^{-1}x + \tan^{-1}\frac{2(1-x)}{3} = \frac{\pi}{4}$

28. Evaluate $\cos\sin^{-1}\frac{1}{4} + \sec^{-1}\frac{4}{3}$

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16. Solve $\sin^{-1}x + \sin^{-1}(\sqrt{3}x) = \frac{\pi}{2}$

17. Solve $\tan^{-1}x = \cot^{-1}x$

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

19. Given that $a \geq 0, b \geq 0$ and $(a + 1)(b + 1) = 2$,

    find $\tan^{-1}a + \tan^{-1}b$

20. Solve $\cos^{-1}x - \sin^{-1}x = \cos^{-1}(x\sqrt{3})$ where all angles are acute

21. Find the principal value of $\cos^{-1}x$, for $x = \frac{\sqrt{3}}{2}$

22. Evaluate $\tan^{-1}\sin\frac{-\pi}{2}$

23. Find the value of $\tan^{-1}\tan\frac{9\pi}{8}$

24. Evaluate $\tan(\tan^{-1}(-4))$

25. Evaluate $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$

26. Prove that $\tan(\cot^{-1}x) = \cot(\tan^{-1}x)$

27. Find the value of $\sin 2\cot^{-1}\frac{-5}{12}$

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29. Prove that $2\sin^{-1}\frac{3}{5} - \tan^{-1}\frac{17}{31} = \frac{\pi}{4}$

30. Prove that $\cot^{-1}7 + \cot^{-1}8 + \cot^{-1}18 = \cot^{-1}3$

31. Find the value of $\sin(2\tan^{-1}\frac{2}{3}) + \cos(\tan^{-1}\sqrt{3})$

32. Solve for x. $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1}x, x > 0$

33. Find the values of x which satisfy the equation. $\sin^{-1}x + \sin^{-1}(1 - x) = \cos^{-1}x$

34. Solve the equation $\sin^{-1}6x + \sin^{-1}6\sqrt{3}\,x = -\frac{\pi}{2}$

35. Show that $2\tan^{-1}\left\{\tan\frac{\alpha}{2} \cdot \tan\left(\frac{\pi}{4} - \frac{\beta}{2}\right)\right\} = \tan^{-1}\frac{\sin\alpha\cos\beta}{\cos\alpha+\sin\beta}$

36. Find the value of $\sin^{-1}\left(\cos\left(\frac{43\pi}{5}\right)\right)$

37. Find the principal value of the expression $\cos^{-1}[\cos(-680)]$

38. Find the value of $\cot(\sin^{-1}x)$

39. If $\sin^{-1}x + \sin^{-1}y = \frac{\pi}{2},$ then find the value of $\cos^{-1}x + \cos^{-1}y$

40. Find the value of $\tan(\cos^{-1}\frac{3}{5} + \tan^{-1}\frac{1}{4})$

41. Find the value of the expression $\sin[\cot^{-1}(\cos(\tan^{-1}1))]$

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