Name: Date:

Q01. Find the principal value of $\sin^{-1}(\frac{1}{\sqrt{2}})$

Q02. Find the value of $\sin^{-1}(\sin^{-1}\frac{3\pi}{5})$.

Q03. Find the value of $\tan^{-1}\sqrt{3} - \cot^{-1}-\sqrt{3}$.

Q04. Find the value of $\sin(\sin^{-1}a + \cos^{-1}a)$

Q05. $\tan^{-1}\left(\frac{x}{y}\right) - \tan^{-1}\left(\frac{x-y}{x+y}\right)$.

Q06. Find the principal value of $\cot^{-1}(-\frac{1}{\sqrt{3}})$.

Q07. Find the value of $\cos^{-1}(\cos\frac{13\pi}{6})$.

Q08. Find the value of $\sin\left(\frac{\pi}{3} - \sin^{-1}\left(-\frac{1}{2}\right)\right)$

Q09. Prove that $\cot^{-1}\left(\frac{ab+1}{a-b}\right) + \cot^{-1}\left(\frac{bc+1}{b-c}\right) + \cot^{-1}\left(\frac{ca+1}{c-a}\right) = 0$

Q10. $\sin(\tan^{-1}x) = ?$.

Q11. Find the principal value of $\cos^{-1}(-\frac{1}{2})$.

Q12. Find the value of $\tan^{-1}(\tan\frac{7\pi}{6})$

Q13. Find the value of $\cot(\tan^{-1}a + \cot^{-1}a)$.

Q14. Prove that $\tan^{-1}\sqrt{x} = \frac{1}{2}\cos^{-1}\left(\frac{1-x}{1+x}\right)$

Q15. $\tan^{-1}(\tan\frac{3\pi}{4}) = ?$.

Q16. Find the principal value of $\csc^{-1}(-\sqrt{2})$.

Q17. Find the value of $\sin^{-1}(\sin\frac{2\pi}{3})$.

Q18. Find the value of $\cos(\sec^{-1}x + \csc^{-1}x)$.

Q19. Prove that $\tan^{-1}\sqrt{\frac{1-\cos x}{1+\cos x}} = \frac{x}{2}$.

Q20. $\tan^{-1}\left(\frac{3a^2x - x^3}{a^3 - 3ax^2}\right) = ?$

Q21. Find the principal value of $\sec^{-1}(\frac{3}{\sqrt{3}})$

Q22. Find the value of $\cos^{-1}(\cos\frac{7\pi}{6})$.

Q23. Find the value of $\cot^{-1}(\frac{1}{\sqrt{x^2-1}})$.

Q24. Find $\tan^{-1}(\frac{x}{\sqrt{a^2-x^2}})$.

Q25. Find the value of $\tan^{-1}\left[2\cos\left(2\sin^{-1}\left(\frac{1}{2}\right)\right)\right]$.

Q26. Find the value of $\tan^{-1}(1) + \cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}\left(-\frac{1}{2}\right)$

Q27. Show that $\sin^{-1}\frac{3}{5} - \sin^{-1}\frac{8}{17} = \cos^{-1}\frac{84}{85}$

Q28. Prove that $\tan^{-1}\frac{1}{5} + \tan^{-1}\frac{1}{7} + \tan^{-1}\frac{1}{3} + \tan^{-1}\frac{1}{8} = \frac{\pi}{4}$.

Q29. Prove that $\tan^{-1}x + \tan^{-1}\left(\frac{2x}{1-x^2}\right) = \tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)$

Q30. Simplify $\sin^{-1}\left(\frac{sinx + cosx}{\sqrt{2}}\right)$ or $\cos^{-1}\left(\frac{3}{5}cosx + \frac{4}{5}sinx\right)$

Q31. Explore $\tan^{-1}\left(\frac{cosx}{1-sinx}\right)$ in the simplest form.

Q32. Show that $\sin^{-1}\frac{12}{13} + \cos^{-1}\frac{4}{5} + \tan^{-1}\frac{63}{16} = \pi$.

Q33. Prove that $\cot^{-1}\left(\frac{\sqrt{1+sinx} + \sqrt{1-sinx}}{\sqrt{1+sinx} - \sqrt{1-sinx}}\right) = \frac{x}{2}$.

Q34. Write in tbhe simplest form that $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$.

Q35. Prove $2\tan^{-1}\frac{1}{5} + sex^{-1}\frac{5\sqrt{2}}{7} + 2\tan^{-1}\frac{1}{8} = \frac{\pi}{4}$.

Q36. Prove $2\tan^{-1}\frac{1}{2} + sex^{-1}\frac{1}{7} = \tan^{-1}\frac{31}{17}$.

Q37. Simplify $\tan^{-1}\left(\frac{a\,cosx-b\,sinx}{b\,cosx+a\,sinx}\right)$.

Q38. Prove that $\tan^{-1}\left(\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right) = \frac{\pi}{4} - \frac{1}{2}\cos^{-1}x$

Q39. If $\sin(\sin^{-1}\frac{1}{5} + \cos^{-1}x) = 1$. Find x.

Q40. Prove that $\cot^{-1}\left(\frac{ab+1}{a-b}\right) + \cot^{-1}\left(\frac{bc+1}{b-c}\right) + \cot^{-1}\left(\frac{ca+1}{c-a}\right) = \pi$

Q41. Find the value $\tan\frac{1}{2}\left[\sin^{-1}\frac{2x}{1+x^2} + \cos^{-1}\frac{1-y^2}{1+y^2}\right]$.

Q42. Solve $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$.

Q43. Prove that $\frac{9\pi}{4} - \frac{9}{4}\sin^{-1}\frac{1}{3} = \frac{9}{4}\sin^{-1}\frac{2\sqrt{2}}{3}$

Q44. Find the value of $\tan(\sin^{-1}\frac{3}{5} + \cot^{-1}\frac{3}{2})$.

Q45. If $\cos^{-1}\frac{x}{a} + \cos^{-1}\frac{y}{b} = \alpha$. Prove that $\frac{x^2}{a^2} - \frac{2xy}{ab}\cos x + \frac{y}{b} = \sin^2\alpha$.

Q46. If $\tan^{-1}\frac{x-1}{x-2} + \tan^{-1}\frac{x+1}{x+2} = \frac{\pi}{4}$. Find x.

Q47. Show that $\sin^{-1}\left(\frac{8}{17}\right) + \sin^{-1}\left(\frac{3}{5}\right) = \tan^{-1}\left(\frac{77}{36}\right)$.

Q48. Solve $\tan^{-1}\frac{1-x}{1+x} = \frac{1}{2}\tan^{-1}x =$.

Q49. Find x. If $\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$

Q50. Prove that $\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}\frac{a}{b}\right) + \tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\frac{a}{b}\right) = \frac{2b}{a}$.

Q51. Prove that $\cos^{-1}x = 2\sin^{-1}\sqrt{\frac{1-x}{2}} = 2\cos^{-1}\sqrt{\frac{1+x}{2}}$.