



1. Find the range of $f(x) = \sin^{-1} x + \cos^{-1} x + \tan^{-1} x$
2. Solve for x : $4\sin^{-1}(x-2) + \cos^{-1}(x-2) = \pi$
3. Solve for x : $\sin^{-1}(x^2 - 2x + 1) + \cos^{-1}(x^2 - x) = \frac{\pi}{2}$
4. Find the number of real solutions of $\tan^{-1}\sqrt{x(x+1)} + \sin^{-1}\sqrt{x^2+x+1} = \frac{\pi}{2}$
5. If $\sin^{-1}\left(x - \frac{x^2}{2} + \frac{x^3}{4} - \dots \dots \right) + \cos^{-1}\left(x^2 - \frac{x^4}{2} + \frac{x^6}{4} - \dots \dots \right) = \frac{\pi}{2}$, for $0 < |x| < \sqrt{2}$, then find x .
6. Solve for x : $\sin^{-1} x > \cos^{-1} x$
7. $(\sin^{-1} x)^2 - 3\sin^{-1} x + 2 = 0$
8. $\sin^{-1} x + \sin^{-1} 2y = \pi$
9. $\cos^{-1} x + \cos^{-1} x^2 = 2\pi$
10. $\cos^{-1} x + \cos^{-1} x^2 = 0$
11. $4\sin^{-1}(x-1) + \cos^{-1}(x-1) = \pi$
12. $\cot^{-1}\left(\frac{1}{x^2-1}\right) + \tan^{-1}(x^2-1) = \frac{\pi}{2}$
13. $\cot^{-1}\left(\frac{x^2-1}{2x}\right) + \tan^{-1}\left(\frac{2x}{x^2-1}\right) = \frac{2\pi}{3}$
14. $4\sin^{-1} x + \cos^{-1} x = \frac{3\pi}{4}$
15. $5\tan^{-1} x + 3\cot^{-1} x = \frac{7\pi}{4}$
16. $5\tan^{-1} x + 4\cot^{-1} x = 2\pi$
17. $\cot^{-1} x - \cot^{-1}(x+1) = \frac{\pi}{2}$
18. $[\sin^{-1} x] + [\cos^{-1} x] = 0$
19. $[\tan^{-1} x] + [\cot^{-1} x] = 0$
20. $[\sin^{-1} \cos^{-1} \sin^{-1} \tan^{-1} x] = 0$
21. $[\sin^{-1} \cos^{-1} \sin^{-1} \tan^{-1} x] = 1$
22. $(\tan^{-1} x)^2 + (\cot^{-1} x)^2 = \frac{5\pi^2}{8}$
23. Find the value of $\cos\left(\frac{1}{2}\cos^{-1}\left(\frac{3}{5}\right)\right)$.
24. Find the value of $\sin\left(\frac{\pi}{4} + \sin^{-1}\left(\frac{1}{2}\right)\right)$.
25. If m is a root of $x^2 + 3x + 1 = 0$, then find the value of $\tan^{-1}(m) + \tan^{-1}\left(\frac{1}{m}\right)$.
26. Prove that $\cos\left(\tan^{-1}(\sin(\cot^{-1} x))\right) = \sqrt{\frac{x^2+1}{x^2+2}}$



Questions Solve for x:

27. $6(\sin^{-1} x)^2 - \pi \sin^{-1} x \leq 0$

28. $\frac{2\tan^{-1} x + \pi}{4\tan^{-1} x - \pi} \leq 0$

29. $\sin^{-1} x < \sin^{-1} x^2$

30. $\cos^{-1} x > \cos^{-1} x^2$

31. $\log^2 (\tan^{-1} x) > 1$

32. $(\cot^{-1} x)^2 - 5\cot^{-1} x + 6 > 0$

33. $\sin^{-1} x < \cos^{-1} x$

34. $\sin^{-1} x > \sin^{-1} (1 - x)$

35. $\sin^{-1} 2x > \operatorname{cosec}^{-1} x$



Answer Key

1. $R_f = \left[\frac{\pi}{4}, \frac{3\pi}{4} \right]$

2. $x = \frac{5}{2}$

3. $x = 1$

4. 2

5. $x = 1$

6. $x \in \left(\frac{1}{\sqrt{2}}, 1 \right]$

7. $x = \sin(1)$

8. $x = 1, y = \frac{1}{2}$

9. $x = \varphi$

10. $x = 1$

11. $x = \frac{3}{2}$

12. $x = \{-\sqrt{2}, 0, \sqrt{2}\}$

13. $x = -\frac{1}{\sqrt{3}}$

14. $\frac{\sqrt{3}-1}{2\sqrt{2}}$

15. $(\sqrt{2} - 1)$

16. $x = 0$

17. $x = \varphi$

18. $x \in [\cos(1), \sin(1)]$

19. $x \in [\cot(1), \tan(1)]$ 20. $\tan(\sin(\cos(\sin(1)))) < x \leq \tan(\sin(1))$

22. $x = -1$

23. $\cos \theta = \frac{2}{\sqrt{5}}$

24. $\frac{\sqrt{3}+1}{2\sqrt{2}}$

25. $-\frac{\pi}{2}$

26. $\sqrt{\frac{x^2+1}{x^2+2}}$

27. $0 \leq x \leq \frac{1}{2}$

28. $-\infty < x < 1$

29. $x \in [-1, 0)$

30. $-1 \leq x < 0$

31. $\tan 2, \infty$

32. $x \in (\cot 2, \cot 3)$

33. $x \in \left[-1, \frac{1}{\sqrt{2}}\right)$

34. $x \in \left(\frac{1}{2}, 1\right]$

35. $x \in \left(-\frac{1}{\sqrt{2}}, 0\right) \cup \left(\frac{1}{\sqrt{2}}, 1\right]$