

1) If $\sin^{-1} x = y$, then

- (a) $0 \leq y \leq \pi$ (b) $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$ (c) $0 < y < \pi$ (d) $\left\{ \frac{\pi}{2} \right\}$

2) $\tan^{-1} \sqrt{3} \sec^{-1}(-2)$ is equal to

- (a) π (b) $-\frac{\pi}{3}$ (c) $\frac{\pi}{3}$ (d) $\frac{2\pi}{3}$

3) $\cos^{-1} \left(\cos \frac{7\pi}{6} \right)$ is equal to

- (a) $\frac{7\pi}{6}$ (b) $\frac{5\pi}{6}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

4) $\sin \left(\frac{\pi}{3} - \sin^{-1} \left(-\frac{1}{2} \right) \right)$ is equal to

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) 1

5) $\tan^{-1} \sqrt{3} - \cot^{-1}(-\sqrt{3})$ is equal to

- (a) π (b) $-\frac{\pi}{2}$ (c) 0 (d) $2\sqrt{3}$

6) $\sin(\tan^{-1} x)$, $|x| < 1$ is equal to

- (a) $\frac{x}{\sqrt{1-x^2}}$ (b) $\frac{1}{\sqrt{1-x^2}}$ (c) $\frac{1}{\sqrt{1+x^2}}$ (d) $\frac{x}{\sqrt{1+x^2}}$

7) $\sin^{-1}(1-x) - 2 \sin^{-1} x = \frac{\pi}{2}$, then x is equal to

- (a) 0, $\frac{1}{2}$ (b) 1, $\frac{1}{2}$ (c) 0 (d) $\frac{1}{2}$

8) $\tan^{-1} \left(\frac{x}{y} \right) - \tan^{-1} \frac{x-y}{x+y}$ is equal to

- (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{3\pi}{4}$

9) Principal value of $\sin^{-1} -\frac{1}{2}$ is

- (a) $\frac{\pi}{3}$ (b) $-\frac{\pi}{3}$ (c) $\frac{5\pi}{3}$ (d) $-\frac{\pi}{6}$

10) $\tan^{-1} \left\{ \sin \left(-\frac{\pi}{2} \right) \right\}$ is equal to

- (a) -1 (b) 1 (c) $\frac{\pi}{2}$ (d) $-\frac{\pi}{4}$

11) $\sec(\tan^{-1} (-\frac{y}{3}))$ is equal to

- (a) $\frac{\sqrt{9+y^2}}{9}$ (b) $\frac{\sqrt{9+y^2}}{3}$ (c) $\frac{3}{\sqrt{9+y^2}}$ (d) $\frac{9}{\sqrt{9+y^2}}$

12) If $\sec^{-1} x + \sec^{-1} y = \frac{\pi}{2}$ the value of $\operatorname{cosec}^{-1} x + \operatorname{cosec}^{-1} y$ is

- (a) π (b) $\frac{\pi}{2}$ (c) $\frac{3\pi}{2}$ (d) $\geq -\pi$

13) Principal value of the expression $\cos^{-1}[\cos(-680^\circ)]$ is

- (a) $\frac{2\pi}{9}$ (b) $-\frac{2\pi}{9}$ (c) $\frac{34\pi}{9}$ (d) $\frac{\pi}{9}$

14) The domain of the function $y = \sin^{-1}(x^2)$ is

- (a) [0, 1] (b) (0, 1) (c) [-1, 1] (d) Φ

15) The value of $\tan^2(\sec^{-1} 2) + \cot^2(\operatorname{cosec}^{-1} 3)$ is

- (a) 5 (b) 11 (c) 13 (d) 15

16) If $3 \sin^{-1} x + \cos^{-1} x = \pi$, then x is equal to

- (a) 0 (b) $\frac{1}{\sqrt{2}}$ (c) 1 (d) $\frac{1}{2}$

17) What is the principal value of $\sec^{-1} \left(-\frac{1}{2} \right)$

- (a) $\frac{\pi}{3}$ (b) not defined (c) $-\frac{\pi}{3}$ (d) $\frac{2\pi}{3}$

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18) Evaluate $\operatorname{cosec}\left(\operatorname{cosec}^{-1}\left(\frac{-\sqrt{3}}{2}\right)+\frac{\pi}{6}\right)$

- (a) $\pi/3$ (b) π (c) 1 (d) not defined

19) Value of $\cot^{-1}\left(\sin\left(-\frac{\pi}{2}\right)\right)$

- (a) $\frac{3\pi}{4}$ (b) $-\frac{\pi}{4}$ (c) -1 (d) $\frac{\pi}{4}$

20) The value of $\cos\left\{\frac{\pi}{3}\left(\sin^{-1}\left(\frac{-1}{2}\right)\right)\right\}$ is given by

- (a) -1 (b) 0 (c) 1 (d) $1/3$

21) The principal value of $\tan^{-1} 1$ is given by

- (a) $\pi/2$ (b) $\pi/3$ (c) $\pi/6$ (d) $\pi/4$

22) Value of $\sin^{-1}\left(\sin\frac{7\pi}{4}\right)$ in the range of $\sin^{-1}x$ is

- (a) $3\pi/4$ (b) $\pi/4$ (c) $7\pi/4$ (d) $-\pi/4$

23) Value of $\sin\left(2\cos^{-1}\left(\frac{-1}{2}\right)\right)$

- (a) $\sqrt{3}/2$ (b) -1 (c) $-\sqrt{3}/2$ (d) $-1/2$

24) If $\sin^{-1} x = y$, then

- (a) $0 \leq y \leq x$ (b) $\frac{-\pi}{2} \leq y \leq \frac{\pi}{2}$ (c) $\setminus(0$ (d) $\setminus(\frac{-\pi}{2}, \frac{\pi}{2})$

25) $\sin\left(\frac{\pi}{3} - \sin^{-1}\left(-\frac{1}{2}\right)\right)$ is equal to

- (a) $1/2$ (b) $1/3$ (c) $1/4$ (d) 1

26) The value of $\tan^{-1}\left[2\sin\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right]$ is

- (a) $\frac{\pi}{3}$ (b) $\frac{2\pi}{3}$ (c) $-\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

27) The value of $\tan^{-1}\left(\tan\frac{5\pi}{6}\right) + \cos^{-1}\left(\cos\frac{13\pi}{6}\right)$ is

- (a) 0 (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{2\pi}{3}$

28) The value of $\sin\left(2\tan^{-1}\frac{2}{3}\right) - \cos\left(2\tan^{-1}\sqrt{3}\right)$ is

- (a) $\frac{26}{37}$ (b) $\frac{37}{26}$ (c) $\frac{12}{13}$ (d) $\frac{13}{15}$

29) The value of $\tan\left(\cos^{-1}\frac{3}{5} + \tan^{-1}\frac{1}{4}\right)$ is

- (a) $\frac{19}{8}$ (b) $\frac{8}{19}$ (c) $\frac{19}{12}$ (d) $\frac{3}{4}$

30) If $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$, then x is equal to

- (a) 1 (b) $-1, \frac{1}{10}$ (c) $\frac{1}{6}$ (d) None of these

31) The domain in which sine function will be one-one, is

- (a) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ (b) $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$ (c) $[0, \pi]$ (d) Both 'a' and 'b'

32) If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \frac{3\pi}{2}$, then the value of $x^{100} + y^{100} + z^{100} - \frac{9}{x^{101} + y^{101} + z^{101}}$ is

- (a) 0 (b) 1 (c) 2 (d) 3

33) The value of $\cos\left[\tan^{-1}\left\{\sin\left(\cot^{-1} x\right)\right\}\right]$ is

- (a) $\frac{1}{\sqrt{x^2+2}}$ (b) $\sqrt{\frac{x^2+2}{x^2+1}}$ (c) $\sqrt{\frac{x^2+1}{x^2+2}}$ (d) $\frac{1}{\sqrt{x^2+1}}$

34) The equation $\tan^{-1} x - \cot^{-1} x = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ has

- (a) no solution (b) unique solution (c) infinite number of solutions (d) two solutions

35) If $\alpha \leq 2\sin^{-1} x + \cos^{-1} x \leq \beta$, then

- (a) $\alpha = -\frac{\pi}{2}, \beta = \frac{\pi}{2}$ (b) $\alpha = 0, \beta = \pi$ (c) $\alpha = -\frac{\pi}{2}, \beta = \frac{3\pi}{2}$ (d) $\alpha = 0, \beta = 2\pi$

36) The value of $\tan^2(\sec^{-1} 2) + \cot^2(\operatorname{cosec}^{-1} 3)$ is

- (a) 5 (b) 13 (c) 11 (d) 15

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37) The greatest and least value of $(\sin^{-1} x)^2 + (\cos^{-1} x)^2$ are respectively

- (a) $\frac{5\pi^2}{4}$ and $\frac{\pi^2}{8}$ (b) $\frac{\pi}{2}$ and $-\frac{\pi}{2}$ (c) $\frac{\pi^2}{4}$ and $-\frac{\pi^2}{4}$ (d) $\frac{\pi^2}{4}$ and 0

38) If $\sin^{-1} \frac{1}{3} + \sin^{-1} \frac{2}{3} = \sin^{-1} x$, then x is equal to

- (a) 0 (b) $\frac{\sqrt{5}-4\sqrt{2}}{9}$ (c) $\frac{\sqrt{5}+4\sqrt{2}}{9}$ (d) $\frac{\pi}{2}$

39) The principal value of $\sin^{-1}(\sin \frac{2\pi}{3})$ is

- (a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{3}$ (c) $-\frac{\pi}{6}$ (d) $\frac{\pi}{6}$

40) The value of $\cos^{-1}(\frac{1}{2}) + 3\sin^{-1}(\frac{1}{2})$ is equal to

- (a) $\frac{\pi}{4}$ (b) $\frac{\pi}{6}$ (c) $\frac{2\pi}{3}$ (d) $\frac{5\pi}{6}$

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