

# INVERSE TRIGONOMETRIC FUNCTIONS

Assignment 4 Practice by O.P. GUPTA • M. +91-9650350480

- Q01. The value of  $\sin^{-1}\left(\cos\frac{3\pi}{5}\right)$  is  
(a)  $\frac{\pi}{10}$  (b)  $\frac{3\pi}{5}$  (c)  $-\frac{\pi}{10}$  (d)  $-\frac{3\pi}{5}$
- Q02. The value of  $\tan\left[\frac{1}{2}\cos^{-1}\left(\frac{\sqrt{5}}{3}\right)\right]$  is  
(a)  $\frac{3+\sqrt{5}}{2}$  (b)  $\frac{3-\sqrt{5}}{2}$  (c)  $\frac{-3+\sqrt{5}}{2}$  (d)  $\frac{-3-\sqrt{5}}{2}$
- Q03. The principal value of  $\cot^{-1}(-\sqrt{3})$  is  
(a)  $-\frac{\pi}{6}$  (b)  $\frac{\pi}{6}$  (c)  $\frac{2\pi}{3}$  (d)  $\frac{5\pi}{6}$
- Q04. The domain of the function  $f(x) = \sin^{-1}(2x)$  is  
(a)  $[0, 1]$  (b)  $[-1, 1]$  (c)  $\left[-\frac{1}{2}, \frac{1}{2}\right]$  (d)  $[-2, 2]$
- Q05. The principal value of  $\tan^{-1}\left(\tan\frac{3\pi}{5}\right)$  is  
(a)  $\frac{2\pi}{5}$  (b)  $-\frac{2\pi}{5}$  (c)  $\frac{3\pi}{5}$  (d)  $-\frac{3\pi}{5}$
- Q06. The principal value of  $\cos^{-1}\left(\cos\frac{13\pi}{6}\right)$  is  
(a)  $\frac{13\pi}{6}$  (b)  $\frac{\pi}{2}$  (c)  $\frac{\pi}{3}$  (d)  $\frac{\pi}{6}$
- Q07. The value of  $\tan^{-1}\left(\tan\frac{7\pi}{6}\right)$  is  
(a)  $\frac{\pi}{6}$  (b)  $\frac{\pi}{2}$  (c)  $\frac{\pi}{3}$  (d)  $\frac{7\pi}{6}$
- Q08. If  $\cos\left(\sin^{-1}\frac{2}{\sqrt{5}} + \cos^{-1}x\right) = 0$ , then x is equal to  
(a)  $\frac{1}{\sqrt{5}}$  (b)  $-\frac{2}{\sqrt{5}}$  (c)  $\frac{2}{\sqrt{5}}$  (d) 1
- Q09. If  $\sin^{-1}x + \sin^{-1}y = \frac{2\pi}{3}$ , then the value of  $\cos^{-1}x + \cos^{-1}y$  is  
(a)  $\frac{2\pi}{3}$  (b)  $\frac{\pi}{3}$  (c)  $\frac{\pi}{2}$  (d)  $\pi$
- Q10.  $\left(\tan^{-1}\frac{7}{9} + \tan^{-1}\frac{1}{8}\right)$  is equal to  
(a)  $\tan^{-1}\left(\frac{65}{72}\right)$  (b)  $\tan^{-1}\left(\frac{63}{65}\right)$  (c)  $\frac{\pi}{4}$  (d)  $\frac{\pi}{2}$
- Q11.  $\tan\left(\sin^{-1}\frac{3}{5} + \tan^{-1}\frac{3}{4}\right)$  is equal to

(a)  $\frac{7}{24}$

(b)  $\frac{24}{7}$

(c)  $\frac{3}{2}$

(d)  $\frac{3}{4}$

Q12.  $\tan^{-1} 3 + \tan^{-1} \lambda = \tan^{-1} \left( \frac{3+\lambda}{1-3\lambda} \right)$  is valid for what values of  $\lambda$ ?

(a)  $\lambda \in \left( -\frac{1}{3}, \frac{1}{3} \right)$

(b)  $\lambda > \frac{1}{3}$

(c)  $\lambda < \frac{1}{3}$

(d) All real values of  $\lambda$ 

Q13. The range of the principal value branch of the function  $y = \sec^{-1} x$  is \_\_\_\_\_.

Q14. The principal value of  $\cos^{-1} \left( -\frac{1}{2} \right)$  is \_\_\_\_\_.

Q15. Two angles of a triangle are  $\cot^{-1} 2$  and  $\cot^{-1} 3$ . The third angle of the triangle is \_\_\_\_\_.

Q16. Find the value of  $\sin^{-1} \left[ \sin \left( -\frac{17\pi}{8} \right) \right]$ .

Q17. Evaluate :  $\sin \left[ \frac{\pi}{3} - \sin^{-1} \left( -\frac{1}{2} \right) \right]$ .

Q18. Express :  $\sin^{-1} \left( \frac{\sin x + \cos x}{\sqrt{2}} \right)$ , where  $-\frac{\pi}{4} < x < \frac{\pi}{4}$ , in the simplest form.

Q19. Express :  $\tan^{-1} \left( \frac{\cos x}{1 - \sin x} \right)$ ,  $-\frac{3\pi}{2} < x < \frac{\pi}{2}$  in the simplest form.

Q20. Simplify :  $\sec^{-1} \left( \frac{1}{2x^2 - 1} \right)$ ,  $0 < x < \frac{1}{\sqrt{2}}$ .

Q21. Prove that :  $\sin^{-1} (2x\sqrt{1-x^2}) = 2\cos^{-1} x$ ,  $\frac{1}{\sqrt{2}} \leq x \leq 1$ .

Q22. Prove that :  $\tan^{-1} \sqrt{x} = \frac{1}{2} \cos^{-1} \left( \frac{1-x}{1+x} \right)$ ,  $x \in [0, 1]$ .

Q23. Solve for  $x$  :  $\sin^{-1} (1-x) - 2\sin^{-1} x = \frac{\pi}{2}$ .

Q24. Solve the equation for  $x$  :  $\sin^{-1} \left( \frac{5}{x} \right) + \sin^{-1} \left( \frac{12}{x} \right) = \frac{\pi}{2}$ , ( $x \neq 0$ ).

Q25. Solve for  $x$  :  $\sin^{-1} 4x + \sin^{-1} 3x = -\frac{\pi}{2}$ .

Q26. Prove that :  $\frac{9\pi}{8} - \frac{9}{4} \sin^{-1} \left( \frac{1}{3} \right) = \frac{9}{4} \sin^{-1} \left( \frac{2\sqrt{2}}{3} \right)$ .

Q27. Prove that :  $\tan \left[ 2 \tan^{-1} \left( \frac{1}{2} \right) - \cot^{-1} 3 \right] = \frac{9}{13}$ .


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