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) π

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 λ?

(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 λ

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 : $\sin^{-1}(2x\sqrt{1-x^2})=2\cos^{-1}x, \frac{1}{\sqrt{2}}\le x\le 1$.

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