Topic: Chap 2 (Inverse Trigonometry)

Important Problems for Practice

For 1 mark

Multiple Choice Question(MCQ)

Write the correct option in the following questions:-

1. One branch of $\cos^{-1}$ other than the principal value branch corresponds to
   (A) $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$ (B) $[\pi, 2\pi] - \left\{\frac{3\pi}{2}\right\}$ (C) $(0,\ \pi)$ (D) $[2\pi, 3\pi]$
2. If $\sin^{-1} x = y$ then
   (A) $0 \le y \le \pi$ (B) $-\frac{\pi}{2} \le y \le \frac{\pi}{2}$
   (C) $0 < y < \pi$ (D) $-\frac{\pi}{2} < y < \frac{\pi}{2}$
3. If $\sin^{-1} x = y$ then
   (A) $0 \le x \le 1$ (B) $-1 \le x \le 1$
   (C) $0 < x < 1$ (D) $-1 < y < 1$
4. The domain of $\sin^{-1} 2x$ is
   (A) $[0, 1]$ (B) $[-1, 1]$ (C) $\left[-\frac{1}{2}, \frac{1}{2}\right]$ (D) $[-2, 2]$
5. The domain of $y = \cos^{-1}(x^2 - 4)$ is
   (A) $[3, 5]$ (B) $[0, \pi]$ (C) $[-\sqrt{5}, -\sqrt{3}] \cap [-\sqrt{5}, \sqrt{3}]$ (D) $[-\sqrt{5}, -\sqrt{3}] \cup [\sqrt{3}, \sqrt{5}]$
6. The domain of the function defined by $f(x) = \sin^{-1} x + \cos^{-1} x$ is
   (A) $[-1, 1]$ (B) $[-1, \pi + 1]$ (C) $(-\infty, \infty)$ (D) $\emptyset$
7. If $\tan^{-1} x = y$ then
   (A) $0 \le y \le \pi$ (B) $-\frac{\pi}{2} \le y \le \frac{\pi}{2}$
   (C) $0 < y < \pi$ (D) $-\frac{\pi}{2} < y < \frac{\pi}{2}$
8. The principal value of the expression $\cos^{-1}[\cos(-680^0)]$ is
   (A) $\frac{2\pi}{9}$ (B) $-\frac{2\pi}{9}$ (C) $\frac{34\pi}{9}$ (D) $\frac{\pi}{9}$
9. $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$ is equal to
   (A) $\frac{7\pi}{6}$ (B) $\frac{5\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$
10. $\cos^{-1}\left(\cos\frac{13\pi}{6}\right)$ is equal to
    (A) $\frac{7\pi}{6}$ (B) $\frac{13\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$
11. $\tan^{-1}\left(\tan\frac{7\pi}{6}\right)$ is equal to
    (A) $\frac{7\pi}{6}$ (B) $\frac{5\pi}{6}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$
12. $\sin^{-1}\left(\sin\frac{2\pi}{3}\right)$ is equal to
    (A) π (B) $-\frac{\pi}{3}$ (C) $\frac{\pi}{3}$ (D) $\frac{2\pi}{3}$

13. $\sin\left(\frac{\pi}{3}-\sin^{-1}\left(-\frac{1}{2}\right)\right)$ is equal to
    (A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) 1
14. $\tan^{-1}\sqrt{3}-\sec^{-1}(-2)$ is equal to
    (A) π (B) $-\frac{\pi}{3}$ (C) $\frac{\pi}{3}$ (D) $\frac{2\pi}{3}$
15. $\tan^{-1}\sqrt{3}-\cot^{-1}(-\sqrt{3})$ is equal to
    (A) π (B) $-\frac{\pi}{2}$ (C) 0 (D)$2\sqrt{3}$
16. $\sin(\tan^{-1}x)$, $|x|<1$ 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) $\frac{x}{\sqrt{1+x^2}}$
17. If $\sin^{-1}x+\sin^{-1}y=\frac{\pi}{2}$, then value of $\cos^{-1}x+\cos^{-1}y$ *is*
    (A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{4}$ (D) π
18. $\sin^{-1}(1-x)-2\sin^{-1}x=\frac{\pi}{2}$, then x is equal to
    (A) $0,\frac{1}{2}$ (B) $1,\frac{1}{2}$ (C) 0 (D) $\frac{1}{2}$

19. $\tan^{-1}\left(\frac{x}{y}\right)-\tan^{-1}\left(\frac{x-y}{x+y}\right)$ is equal to
    (A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$ (C) $\frac{\pi}{4}$ (D) $\frac{-3\pi}{4}$
20. If $\tan^{-1}x=\frac{\pi}{10}$ for some $x\in$ R, then the value of $\cot^{-1}x$ is
    (A) $\frac{\pi}{5}$ (B) $\frac{2\pi}{5}$ (C) $\frac{3\pi}{5}$ (D) $\frac{4\pi}{5}$
21. The value of the expression $\sin[\cot^{-1}(\cos(\tan^{-1}1))]$ is
    (A) 0 (B) 1 (C) $\frac{1}{\sqrt{3}}$ (D) $\sqrt{\frac{2}{3}}$
22. 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 solution (D) two solutions
23. If $\sin^{-1}\left(\frac{2a}{1+a^2}\right)+\cos^{-1}\left(\frac{1-a^2}{1+a^2}\right)=\tan^{-1}\left(\frac{2x}{1-x^2}\right)$, where $a,x\in]0,1[$, then the value of x is
    (A) 0 (B) $\frac{a}{2}$ (C) a (D) $\frac{2a}{1-a^2}$
24. The greatest value of $(\sin^{-1}x)^2+(\cos^{-1}x)^2$ is
    (A) $\frac{5\pi^2}{4}$ (B) $\frac{\pi}{2}$ (C) $\frac{\pi^2}{4}$ (D) $\frac{3\pi^2}{4}$

25. The greatest value of $(\sin^{-1}x)^2+(\cos^{-1}x)^2$ is
    (A) $\frac{\pi^2}{8}$ (B) $\frac{-\pi}{2}$ (C) $\frac{-\pi^2}{4}$ (D) 0

Answer Key

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
B	B	B	C	D	A	D	A	B	D	D	C	D	B	B	D	A	C	C	B	D	B	D	A	A

For online MCQ test use below link:-

https://docs.google.com/forms/d/e/1FAIpQLSdCpsE6vT4KFFf0fm1_SMYAkqtnW-aqxMfu5v2DBVXUD44FWw/viewform?vc=0&c=0&w=1