DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 9**

Topic :-INVERSE TRIGONOMETRICE FUNCTIONS

1. If $x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, then the value of $\tan^{-1}\left(\frac{\tan x}{4}\right) + \tan^{-1}\left(\frac{3\sin 2x}{5+3\cos 2x}\right)$ is
   a) $\frac{x}{2}$ b) $2x$ c) $3x$ d) x

2. If $-\frac{1}{2} \leq x \leq \frac{1}{2}$, then $\sin^{-1}(3x - 4x^3)$ equals
   a) $3\sin^{-1} x$ b) $\pi - 3\sin^{-1} x$ c) $-\pi - 3\sin^{-1} x$ d) None of these

3. If $\tan\theta + \tan\left(\frac{\pi}{3}+\theta\right) + \tan\left(\frac{-\pi}{3}+\theta\right) = K\tan 3\theta$, then the value of K is
   a) 1 b) 1/3 c) 3 d) none of these

4. If $-1 \leq x \leq 0$, then $\cos^{-1}(2x^2 - 1)$ equals
   a) $2\cos^{-1} x$x b) $\pi - 2\cos^{-1} x$ c) $2\pi - 2\cos^{-1} x$ d) $-2\cos^{-1} x$

5. If $\alpha = \sin^{-1}\frac{\sqrt{3}}{2} + \sin^{-1}\frac{1}{3}$, $\beta = \cos^{-1}\frac{\sqrt{3}}{2} + \cos^{-1}\frac{1}{3}$, then
   a) $\alpha > \beta$ b) $\alpha = \beta$ c) $\alpha < \beta$ d) $\alpha + \beta = 2\pi$

6. If $x \in [-1, 1]$, then $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ equals
   a) $2\tan^{-1} x$ b) $\pi - 2\tan^{-1} x$ c) $-\pi - 2\tan^{-1} x$ d) None of these

7. $\sin\left[3\sin^{-1}\left(\frac{1}{5}\right)\right]$ is equal to
   a) $\frac{71}{125}$ b) $\frac{74}{125}$ c) $\frac{3}{5}$ d) $\frac{1}{2}$

8. If $\sum_{i=1}^{20} \sin^{-1} x_i = 10\pi$, then $\sum_{i=1}^{20} x_i$ is equal to
   a) 20 b) 10 c) 0 d) None of these

9. The value of x for which $\sin\left[\cot^{-1}(1+x)\right] = \cos(\tan^{-1} x)$ is
   a) $\frac{1}{2}$ b) 1 c) 0 d) $-\frac{1}{2}$

10. $\tan\left[\frac{\pi}{2} + \frac{1}{2}\cos^{-1}\left(\frac{a}{b}\right)\right] + \tan\left[\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\left(\frac{a}{b}\right)\right]$ is equal to
    a) $\frac{2a}{b}$ b) $\frac{2b}{a}$ c) $\frac{a}{b}$ d) $\frac{b}{a}$

11. $\tan^{-1}\frac{x}{y} - \tan^{-1}\frac{x-y}{x+y}$ is equal to
(where $x < y > 0$)

a) $-\frac{\pi}{4}$ b) $\frac{\pi}{4}$ c) $\frac{3\pi}{4}$ d) None of these

12. The value of $'a'$ for which $ax^2 + \sin^{-1}(x^2 - 2x + 2) + \cos^{-1}(x^2 - 2x + 2) = 0$ has a real solution, is

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

13. $\cos^{-1}\left(\frac{-1}{2}\right) - 2\sin^{-1}\left(\frac{1}{2}\right) + 3\cos^{-1}\left(\frac{-1}{\sqrt{2}}\right) - 4\tan^{-1}(-1)$ equals

a) $\frac{19\pi}{12}$ b) $\frac{35\pi}{12}$ c) $\frac{47\pi}{12}$ d) $\frac{43\pi}{12}$

14. If $\theta = \sin^{-1}x + \cos^{-1}x - \tan^{-1}x$, $1 \le x < \infty$, then the smallest interval in which θ lies is

a) $\frac{\pi}{2} \le \theta \le \frac{3\pi}{4}$ b) $0 \le \theta \le \frac{\pi}{4}$ c) $-\frac{\pi}{4} \le \theta \le 0$ d) $\frac{\pi}{4} \le \theta \le \frac{\pi}{2}$

15. If $4\sin^{-1}x + \cos^{-1}x = \pi$, then x is equal to

a) 0 b) 1/2 c) -1/2 d) 1

16. The value of $\sin^{-1}\left(\cos\frac{33\pi}{5}\right)$ is

a) $\frac{3\pi}{5}$ b) $\frac{7\pi}{5}$ c) $\frac{\pi}{10}$ d) $-\frac{\pi}{10}$

17. If $a_1, a_2, a_3, \ldots, a_n$ are in AP with common ratio d, then $\tan\left[\tan^{-1}\frac{d}{1+a\_1a_2} + \tan^{-1}\frac{d}{1+a_2a_3} + \ldots + \tan^{-1}\frac{4}{1+a_{n-1}a_n}\right]$ is equal to

a) $\frac{(n-1)d}{a_1+a_n}$ b) $\frac{(n-1)d}{1+a_1a_n}$ c) $\frac{nd}{1+a_1a_n}$ d) $\frac{a_n-a_1}{a_n+a_1}$

18. If $\tan^{-1}\left(\frac{a}{x}\right) + \tan^{-1}\left(\frac{b}{x}\right) = \frac{\pi}{2}$, then x is equal to

a) $\sqrt{ab}$ b) $\sqrt{2ab}$ c) $2ab$ d) ab

19. If $A = \tan^{-1}x$, $x \in R$, then the value of $\sin 2A$ is

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

20. The value of x, where $x > 0$ and $\tan\left\{\sec^{-1}\left(\frac{1}{x}\right)\right\} = \sin(\tan^{-1}2)$ is

a) $\sqrt{5}$ b) $\frac{\sqrt{5}}{3}$ c) 1 d) $\frac{2}{3}$