DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 3**

Topic :-INVERSE TRIGONOMETRICE FUNCTIONS

1. $5\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)+7\sin^{-1}\left(\frac{2x}{1+x^2}\right)-4\tan^{-1}\left(\frac{2x}{1-x^2}\right)-\tan^{-1}x=5\pi$, then x is equal to

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

2. If $\sin^{-1}x+\sin^{-1}y+\sin^{-1}z=\frac{3\pi}{2}$ and $f(1)=2$,
$f(p+q)=f(p).f(q),\forall\, p,q\in R$, then
$x^{f(1)}+y^{f(2)}+z^{f(3)}-\frac{(x+y+z)}{x^{f(1)}+y^{f(2)}+z^{f(3)}}$ is equal to

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

3. $\cot^{-1}(\sqrt{\cos\alpha})-\tan^{-1}(\sqrt{\cos\alpha})=x$, then $\sin x$ is equal to

a) $\tan^{-2}\left(\frac{\alpha}{2}\right)$ b) $\cot^2\left(\frac{\alpha}{2}\right)$ c) $\tan\alpha$ d) $\cot\left(\frac{\alpha}{2}\right)$

4. The value of $\cot^{-1}9+\text{cosec}^{-1}\frac{\sqrt{41}}{4}$ is

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

5. $\sum_{m=1}^{n}\tan^{-1}\left(\frac{2m}{m^4+m^2+2}\right)$ is equal to

a) $\tan^{-1}\left(\frac{n^2+n}{n^2+n+2}\right)$ b) $\tan^{-1}\left(\frac{n^2-n}{n^2-n+2}\right)$ c) $\tan^{-1}\left(\frac{n^2+n+2}{n^2+n}\right)$ d) None of these

6. If $\cos^{-1}\frac{3}{5}-\sin^{-1}\frac{4}{5}=\cos^{-1}x$, then x is equal to

a) 0 b) 1 c) -1 d) None of these

7. If $\cot\left(\cos^{-1}x\right)=\sec\left(\tan^{-1}\frac{a}{\sqrt{b^2-a^2}}\right)$, then x is equal to

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

8. The equation $\sin^{-1}x-\cos^{-1}x=\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$ has

a) No solution b) Unique solution
c) Infinite number of solutions d) None of the above

9. If $\theta=\sin^{-1}x+\cos^{-1}x-\tan^{-1}x\geq 0$, then the smallest interval in which θ lies, is given by

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

10. Solution of the equation $\cot^{-1} x + \sin^{-1} \frac{1}{\sqrt{5}} = \frac{\pi}{4}$ is

a) $x = 3$ b) $x = \frac{1}{\sqrt{5}}$ c) $x = 0$ d) None of these

11. $\sin\left(\frac{1}{2}\cos^{-1}\frac{4}{5}\right)$ is equal to

a) $-\frac{1}{\sqrt{10}}$ b) $\frac{1}{\sqrt{10}}$ c) $-\frac{1}{10}$ d) $\frac{1}{10}$

12. If $\sin^{-1}\left(\frac{3}{x}\right) + \sin^{-1}\left(\frac{4}{x}\right) = \frac{\pi}{2}$, then x is equal to

a) 3 b) 5 c) 7 d) 11

13. If $[\cot^{-1} x] + [\cos^{-1} x] = 0$, where x is a non-negative real number and [.] denotes the greatest integer function, then complete set of values of x is

a) (cos 1,1]b) (cot 1,1)c) (cos 1, cot 1)d) None of these

14. If $3\sin^{-1}\frac{2x}{1+x^2} - 4\cos^{-1}\frac{1+x}{1+x^2} + 2\tan^{-1}\frac{2x}{1-x^2} = \frac{\pi}{3}$, then value of x is

a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) None of these

15. Sum of infinite terms of the series

$\cot^{-1}\left(1^2 + \frac{3}{4}\right) + \cot^{-1}\left(2^2 + \frac{3}{4}\right) + \cot^{-1}\left(3^2 + \frac{3}{4}\right) + \ldots$is

a) $\frac{\pi}{4}$ b) $\tan^{-1}(2)$ c) $\tan^{-1} 3$ d) None of these

16. $2\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right)$is equal to

a) $\left(\frac{49}{29}\right)$ b) $\frac{\pi}{2}$ c) $-\left(\frac{49}{29}\right)$ d) $\frac{\pi}{4}$

17. The number of triplets (x, y, z)satisfying $\sin^{-1} x + \cos^{-1} y + \sin^{-1} z = 2\pi$,is

a) 0 b) 2 c) 1 d) Infinite

18. The value of $\sin(\cot^{-1} x)$ is

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

19. If $\cos^{-1} x + \cos^{-1} y = \frac{\pi}{2}$and $\tan^{-1} x - \tan^{-1} y = 0$,then $x^2 + xy + y^2$is equal to

a) 0 b) $\frac{1}{\sqrt{2}}$ c) $\frac{3}{2}$ d) $\frac{1}{8}$

20. If $-1 < x < 1$, then $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ equals

a) $2\tan^{-1} x$ b) $-\pi + 2\tan^{-1} x$ c) $\pi + 2\tan^{-1} x$ d) None of these