Topic :-INVERSE TRIGONOMETRICE FUNCTIONS

1. If x_1, x_2, x_3, x_4 are the roots of the equation $x^4 - x^3 \sin 2\beta - x \cos \beta - \sin \beta = 0$, then $\tan^{-1} + \tan^{-1} x_2 + \tan^{-1} x_3 + \tan^{-1} x_4$ is equal to

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

2. 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

3. $\frac{\alpha^3}{2}\operatorname{cosec}^2\left(\frac{1}{2}\tan^{-1}\frac{\alpha}{\beta}\right) + \frac{\beta^3}{2}\sec^2\left(\frac{1}{2}\tan^{-1}\left(\frac{\beta}{\alpha}\right)\right)$ is
   a) $(\alpha - \beta)(\alpha^2 + \beta^2)$ b) $(\alpha + \beta)(\alpha^2 - \beta^2)$ c) $(\alpha + \beta)(\alpha^2 + \beta^2)$ d) None of these

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

5. 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

6. If $\sec^{-1}x = \operatorname{cosec}^{-1}y$, then $\cos^{-1}\frac{1}{x} + \cos^{-1}\frac{1}{y} =$
   a) π b) $\frac{\pi}{4}$ c) $-\frac{\pi}{2}$ d) $\frac{\pi}{2}$

7. $\sec^2(\tan^{-1}2) + \operatorname{cosec}^2(\cot^{-1}3)$ is equal to
   a) 1 b) 5 c) 10 d) 15

8. If $-1 \leq x \leq -\frac{1}{2}$, 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

9. $\tan\frac{2\pi}{5} - \tan\frac{\pi}{15} - \sqrt{3}\tan\frac{2\pi}{5}\tan\frac{\pi}{15}$ is equal to
   a) $-\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) $\sqrt{3}$

10. The value of $\tan\left\{\cos^{-1}\left(-\frac{2}{7}\right) - \frac{\pi}{2}\right\}$ is

    a) $\frac{2}{3\sqrt{5}}$ b) $\frac{2}{3}$ c) $\frac{1}{\sqrt{5}}$ d) $\frac{4}{\sqrt{5}}$

11.   The value of
$\sin\left(\sin^{-1}\frac{1}{3} + \sec^{-1}3\right) + \cos\left(\tan^{-1}\frac{1}{2} + \tan^{-1}2\right)$ is

    a) 1   b) 2   c) 3   d) 4

12. If $-\frac{1}{\sqrt{3}} < x < \frac{1}{\sqrt{3}}$, then $\tan^{-1}\left(\frac{3x - x^3}{1 - 3x^2}\right)$ equals

    a) $3\tan^{-1}x$ b) $-\pi + 3\tan^{-1}x$ c) $\pi + 3\tan^{-1}x$ d) None of these

13. $\sin\left(\frac{1}{2}\cos^{-1}\frac{4}{5}\right) =$

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

14. The solution of $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$ is

    a) $\frac{1}{6}$ b) -1 c) $\left(\frac{1}{6}, -1\right)$ d) None of these

15. $\sin^{-1}\frac{4}{5} + 2\tan^{-1}\frac{1}{3}$ is equal to

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

16. The equation $2\cos^{-1}x + \sin^{-1}x = \frac{11\pi}{6}$ has

    a) No solution   b) Only one solution   c) Two solutions   d) Three solutions

17. The value of $\cos^{-1}\left(\cos\frac{5\pi}{3}\right) + \sin^{-1}\left(\cos\frac{5\pi}{3}\right)$ is

    a) $\frac{10\pi}{3}$ b) 0   c) $\frac{\pi}{2}$ d) $\frac{5\pi}{3}$

18. The value of $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) - \sin^{-1}\left(\frac{1}{2}\right)$ is

    a) $45°$ b) $90°$ c) $15°$ d) $30°$

19. If $\sin^{-1}x + \sin^{-1}(1 - x) = \cos^{-1}x$, then x equals

    a) $1, -1$ b) $1, 0$ c) $0, \frac{1}{2}$ d) None of these

20. $\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}x\right) + \tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}x\right), x \neq 0$ is equal to

    a) x b) $2x$ c) $\frac{2}{x}$ d) None of these