DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth   SUBJECT : MATHS
DATE :   DPP NO. : 1

Topic :- INVERSE TRIGONOMETRICE FUNCTIONS

1. $\sin^{-1}\left(\frac{3}{5}\right) + \tan^{-1}\left(\frac{1}{7}\right) =$

    a) $\frac{\pi}{4}$ b) $\frac{\pi}{2}$ c) $\cos^{-1}\left(\frac{4}{5}\right)$ d) π

2. If $xy + yz + zx = 1$, then $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z =$

    a) π b) $\pi/2$ c) 1   d) none of these

3. If $x^2 + y^2 + z^2 = r^2$, then
    $\tan^{-1}\left(\frac{xy}{zr}\right) + \tan^{-1}\left(\frac{yz}{xr}\right) + \tan^{-1}\left(\frac{xz}{yr}\right)$ is equal to

    a) π b) $\frac{\pi}{2}$ c) 0   d) None of these

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

    a) $\sin^{-1}\frac{1}{2} - \sin^{-1}x$ b) $\sin^{-1}x - \frac{\pi}{6}$ c) $\sin^{-1}x + \frac{\pi}{6}$ d) None of these

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

    a) $\frac{\pi}{6}$ b) $\frac{\pi}{3}$ c) $\frac{2\pi}{3}$ d) $\frac{\pi}{4}$

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

    a) $\frac{1}{\sqrt{3}}$ b) $\frac{1}{3}$ c) $\frac{1}{6}$ d) $\frac{1}{\sqrt{6}}$

7. The value of $\cos^{-1}\left(-\frac{1}{2}\right)$ among the following, is

    a) $\frac{9\pi}{3}$ b) $\frac{8\pi}{3}$ c) $\frac{5\pi}{3}$ d) $\frac{11\pi}{3}$

8. If $\tan\theta + \tan\left(\frac{\pi}{3} + \theta\right) + \tan\left(-\frac{\pi}{3} + \theta\right) = a\tan 3\theta$, then a is equal to

    a) $1/3$ b) 1   c) 3   d) None of these

9. The value of $\cot^{-1}\frac{3}{4} + \sin^{-1}\frac{5}{13}$ is

    a) $\sin^{-1}\frac{63}{65}$ b) $\sin^{-1}\frac{12}{13}$ c) $\sin^{-1}\frac{65}{68}$ d) $\sin^{-1}\frac{5}{12}$

10. The value of x for which $\cos^{-1}(\cos 4) > 3x^2 - 4x$ is
    a) $\left(0, \frac{2+\sqrt{6\pi-8}}{3}\right)$
    b) $\left(\frac{2-\sqrt{6\pi-8}}{3}, 0\right)$
    c) $(-2, 2)$
    d) $\left(\frac{2-\sqrt{6\pi-8}}{3}, \frac{2+\sqrt{6\pi-8}}{3}\right)$

11. If $x \in (-\infty, 1)$, 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

12. If $\frac{1}{\sqrt{2}} \le x \le 1$, then $\sin^{-1}\left(2x\sqrt{1-x^2}\right)$ equals
    a) $2\sin^{-1}x$
    b) $\pi - 2\sin^{-1}x$
    c) $-\pi - 2\sin^{-1}x$
    d) None of these

13. $\frac{\alpha^3}{2}\csc^2\left(\frac{1}{2}\tan^{-1}\frac{\alpha}{\beta}\right) + \frac{\beta^3}{2}\sec^2\left(\frac{1}{2}\tan^{-1}\left(\frac{\beta}{\alpha}\right)\right)$ 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

14. 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

15. Which one of the following is correct?
    a) $\tan 1 > \tan^{-1}1$
    b) $\tan 1 < \tan^{-1}1$
    c) $\tan 1 = \tan^{-1}1$
    d) None of these

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

17. $2\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right)$ is equal to
    a) $\left(\frac{49}{29}\right)$
    b) $\frac{\pi}{2}$
    c) $-\left(\frac{49}{29}\right)$
    d) $\frac{\pi}{4}$

18. $\tan\left[\frac{1}{2}\sin^{-1}\left(\frac{2a}{1+a^2}\right) + \frac{1}{2}\cos^{-1}\left(\frac{1-a^2}{1+a^2}\right)\right]$ is equal to
    a) $\frac{2a}{1+a^2}$
    b) $\frac{1-a^2}{1+a^2}$
    c) $\frac{2a}{1-a^2}$
    d) None of these

19. The sum of the infinite series
    $$\cot^{-1}2 + \cot^{-1}8 + \cot^{-1}18 + \cot^{-1}32 + \text{...is}$$
    a) π
    b) $\frac{\pi}{2}$
    c) $\frac{\pi}{4}$
    d) None of these

20. 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