

1. The natural domain of the function $f(x) = \sqrt{\sin^{-1}(2x) + \frac{\pi}{3}}$ is
 - (1) $\left[-\frac{1}{2}, \frac{1}{2}\right]$
 - (2) $\left[-\frac{\sqrt{3}}{4}, \frac{1}{2}\right]$
 - (3) $\left[\frac{13}{4}, \frac{1}{2}\right]$
 - (4) $\left[-\frac{\sqrt{3}}{2}, 1\right]$
2. The value of $\sin^{-1} \sin 17 + \cos^{-1} \cos 10$ is equal to
 - (1) 27
 - (2) -27
 - (3) $17 - 5\pi$
 - (4) $9\pi - 27$
3. If $\sin^{-1} x + \sin^{-1} y = \frac{2\pi}{3}$ and $\cos^{-1} x - \cos^{-1} y = \frac{\pi}{3}$. Then, (x, y) is equal to
 - (1) $(0, 1)$
 - (2) $\left(\frac{1}{2}, 1\right)$
 - (3) $\left(1, \frac{1}{2}\right)$
 - (4) $\left(\frac{\sqrt{3}}{2}, 1\right)$
4. Find the value of $\sin\left\{\sin^{-1} \frac{1}{2} + \cos^{-1} \frac{1}{2}\right\}$
 - (1) 3
 - (2) 1
 - (3) 2
 - (4) 4
5. If $4 \sin^{-1} x + \cos^{-1} x = \pi$, then x is equal to
 - (1) 0
 - (2) $1/2$
 - (3) $-1/2$
 - (4) 1
6. The value of $\cot\left(\operatorname{cosec}^{-1}\left(\frac{5}{3}\right) + \tan^{-1}\left(\frac{2}{3}\right)\right)$ is
 - (1) $\frac{5}{17}$
 - (2) $\frac{6}{17}$
 - (3) $\frac{3}{17}$
 - (4) $\frac{4}{17}$
7. $\tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right) - \tan^{-1}\left(\frac{2x}{1-x^2}\right)$ is equal to, $(|x| < \frac{1}{\sqrt{3}})$
 - (1) 0
 - (2) 1
 - (3) $\tan^{-1} x$
 - (4) $\tan^{-1} 2x$
8. If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \frac{3\pi}{2}$, then find value of $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z$.
9. The value of $\sum_{r=0}^{\infty} \tan^{-1}\left(\frac{1}{1+r+r^2}\right)$ is equal to
 - (1) $\frac{\pi}{2}$
 - (2) $\frac{3\pi}{4}$
 - (3) $\frac{\pi}{4}$
 - (4) None of these
10. The value of $\sum_{r=1}^{\infty} \cot^{-1}\left(3r^2 - r - \frac{1}{3}\right)$ is equal to
 - (1) $\cot^{-1} 1$
 - (2) $\cot^{-1} \sqrt{3}$
 - (3) $\cot^{-1} 0$
 - (4) $\cot^{-1}(-1)$