

10. The complete solution set of the inequality  $(\cos^{-1} x)^2 - (\sin^{-1} x)^2 > 0$  is :

(a)  $\left[0, \frac{1}{\sqrt{2}}\right)$

(b)  $\left[-1, \frac{1}{\sqrt{2}}\right)$

(c)  $(-1, 1)$

(d)  $\left[-1, \frac{1}{2}\right)$

$$(\cos^{-1} x)^2 - (\sin^{-1} x)^2 > 0 \Rightarrow (\cos^{-1} x + \sin^{-1} x)(\cos^{-1} x - \sin^{-1} x) > 0$$

$$\Rightarrow \cos^{-1} x - \sin^{-1} x > 0$$

$$\Rightarrow \frac{\pi}{2} - 2\sin^{-1} x > 0 \Rightarrow -\frac{\pi}{2} \leq \sin^{-1} x < \frac{\pi}{4} \Rightarrow -1 \leq x < \frac{1}{\sqrt{2}}$$