

Mathematics

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(Chapter 2)(Inverse Trigonometric Functions)

(Class XII)

(Exemplar Problems)

Objective Type Questions

State **True** or **False** for the following statement:

Question 55:

The principal value of $\sin^{-1} \left[\cos \left(\sin^{-1} \frac{1}{2} \right) \right]$ is $\frac{\pi}{3}$.

Answer 55:

True

Given that $\sin^{-1} \left[\cos \left(\sin^{-1} \frac{1}{2} \right) \right]$

$$\Rightarrow \sin^{-1} \left[\cos \left(\sin^{-1} \sin \frac{\pi}{6} \right) \right]$$

$$= \sin^{-1} \left[\cos \frac{\pi}{6} \right]$$

$$= \sin^{-1} \left(\frac{\sqrt{3}}{2} \right)$$

$$= \sin^{-1} \left(\sin \frac{\pi}{3} \right)$$

$$= \frac{\pi}{3}$$

$$\left[\because \sin^{-1}(\sin x) = x \text{ if } x \in \left[-\frac{\pi}{2}, \frac{\pi}{2} \right] \right]$$

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