

# Mathematics

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## (Chapter 2)(Inverse Trigonometric Functions)

(Class XII)

### (Exemplar Problems)

#### Short Answer (S.A.)

#### Question 2:

Evaluate  $\cos \left[ \cos^{-1} \left( -\frac{\sqrt{3}}{2} \right) + \frac{\pi}{6} \right]$

#### Answer 2:

Let  $\cos^{-1} \left( -\frac{\sqrt{3}}{2} \right) = y$ , then

$$\cos y = -\frac{\sqrt{3}}{2} = \cos \left( \pi - \frac{\pi}{6} \right) = \cos \frac{5\pi}{6}$$

We know that the range of the principal value branch of  $\cos^{-1}$  is  $[0, \pi]$  and

$$\cos \left( \frac{5\pi}{6} \right) = -\frac{\sqrt{3}}{2}$$

So,  $\cos \left[ \cos^{-1} \left( -\frac{\sqrt{3}}{2} \right) + \frac{\pi}{6} \right] = \cos \left( \frac{5\pi}{6} + \frac{\pi}{6} \right) = \cos \pi = -1$

Therefore, value of  $\cos \left[ \cos^{-1} \left( -\frac{\sqrt{3}}{2} \right) + \frac{\pi}{6} \right]$  is  $-1$ .

