

# Mathematics

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## (Chapter 2)(Inverse Trigonometric Functions)

(Class XII)

### (Exemplar Problems)

#### Objective Type Questions

Choose the correct answers from the given four options in the following (MCQ):

#### Question 34:

If  $|x| \leq 1$ , then  $2\tan^{-1}x + \sin^{-1}\left(\frac{2x}{1+x^2}\right)$  is equal to

- (A)  $4\tan^{-1}x$                       (B) 0                      (C)  $\frac{\pi}{2}$                       (D)  $\pi$

#### Answer 34:

- (A)  $4\tan^{-1}x$

#### Solution:

To find:  $2\tan^{-1}x + \sin^{-1}\left(\frac{2x}{1+x^2}\right)$

Now, we have  $2\tan^{-1}x + \sin^{-1}\left(\frac{2x}{1+x^2}\right)$

let  $x = \tan \theta$

$$\Rightarrow 2\tan^{-1} \tan \theta + \sin^{-1}\left(\frac{2 \tan \theta}{1+(\tan \theta)^2}\right)$$

$$= 2\theta + \sin^{-1}(\sin 2\theta)$$

$$= 2\theta + 2\theta$$

$$= 4\theta$$

$$= 4\tan^{-1}x$$

$$\Rightarrow 2\tan^{-1}x + \sin^{-1}\left(\frac{2x}{1+x^2}\right) = 4\tan^{-1}x$$

Hence, the option (A) is correct.

