

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 27:

The value of $\sin(2\tan^{-1}(0.75))$ is equal to


- (A) .75 (B) 1.5 (C) .96 (D) $\sin 1.5$

Answer 27:

- (C) .96

Solution:

To find: $\sin(2\tan^{-1}(0.75))$

Now, we have $\sin(2\tan^{-1}(0.75))$ 

$$\Rightarrow \sin\left(2\tan^{-1}\left(\frac{3}{4}\right)\right)$$

$$= \sin\left[\sin^{-1}\left(\frac{2 \times \frac{3}{4}}{1 + \left(\frac{3}{4}\right)^2}\right)\right] \quad \left[\because 2\tan^{-1}x = \sin^{-1}\left(\frac{2x}{1+x^2}\right)\right]$$

$$= \frac{2 \times \frac{3}{4}}{1 + \left(\frac{3}{4}\right)^2}$$



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$$= \frac{\frac{3}{2}}{1 + \frac{9}{16}} = \frac{\frac{3}{2}}{\frac{25}{16}}$$

$$= \frac{3}{2} \times \frac{16}{25}$$

$$= \frac{24}{25} = 0.96$$

$$\Rightarrow \sin(2\tan^{-1}(0.75)) = 0.96$$

Hence, the option (C) is correct.

