

JEE MAIN INVERSE TRIGONOMETRIC FUNCTIONS — PROPERTIES OF INVERSE TRIGONOMETRIC FUNCTIONS — PYQS

Max. Marks: 24
Questions: 6

Section A (MCQ) — 4 questions

Q.1 Let $\alpha = 3\sin^{-1}\left(\frac{6}{11}\right)$ and $\beta = 3\cos^{-1}\left(\frac{4}{9}\right)$, where inverse trigonometric functions take only the principal values.

Given below are two statements :

Statement-I: $\cos(\alpha + \beta) > 0$.

Statement-II: $\cos(\alpha) < 0$.

In the light of the above statements, choose the correct answer from the options given below :

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) Both Statement-I and Statement-II are true
- (2) Both Statement-I and Statement-II are false
- (3) Statement-I is true but Statement-II is false
- (4) Statement-I is false but Statement-II is true

Scan or tap for the full solution



Q.2 If $\sin(\tan^{-1}(x\sqrt{2})) = \cot(\sin^{-1}\sqrt{1-x^2})$, $x \in (0, 1)$, then the value of x is :

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) $\frac{1}{2}$
- (2) $\frac{1}{3}$
- (3) $\frac{2}{3}$
- (4) $\frac{5}{8}$

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Q.3 The value of

$$\cot^{-1}\left(\frac{\sqrt{1+\tan^2(2)}-1}{\tan(2)}\right) - \cot^{-1}\left(\frac{\sqrt{1+\tan^2\left(\frac{1}{2}\right)}+1}{\tan\left(\frac{1}{2}\right)}\right)$$

is equal to

[JEE Main 2025 (Online) 8th April Evening Shift]

- (1) $\pi - \frac{3}{2}$
- (2) $\pi + \frac{5}{2}$
- (3) $\pi - \frac{5}{4}$
- (4) $\pi + \frac{3}{2}$

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Q.4 Considering the principal values of the inverse trigonometric functions,

$$\sin^{-1}\left(\frac{\sqrt{3}}{2}x + \frac{1}{2}\sqrt{1-x^2}\right), -\frac{1}{2} < x < \frac{1}{\sqrt{2}}, \text{ is}$$

equal to [JEE Main 2025 (Online) 4th April Morning Shift]

$$(1) \frac{-5\pi}{6} - \sin^{-1}x \quad (2) \frac{5\pi}{6} - \sin^{-1}x$$

$$(3) \frac{\pi}{6} + \sin^{-1}x \quad (4) \frac{\pi}{4} + \sin^{-1}x$$

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Section B (Numerical) — 2 questions

Q.5 Let the maximum value of $(\sin^{-1}x)^2 + (\cos^{-1}x)^2$ for $x \in \left[-\frac{\sqrt{3}}{2}, \frac{1}{\sqrt{2}}\right]$ be $\frac{m}{n}\pi^2$, where $\gcd(m, n) = 1$.

Then $m + n$ is equal to _____.

[JEE Main 2026 (Online) 21st January Evening Shift]

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Q.6 If $y = \cos\left(\frac{\pi}{3} + \cos^{-1}\frac{x}{2}\right)$, then $(x - y)^2 + 3y^2$ is equal to _____.

[JEE Main 2025 (Online) 2nd April Evening Shift]

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ANSWER KEY

Section A (MCQ) — 4 questions

Ques.	1	2	3	4						
Ans.	1	1	3	3						

Section B (Numerical) — 2 questions

Ques.	5	6								
Ans.	65	3								