

JEE MAINS 2020 PROBLEM SET : ONLINE

4 JEE Main 2020 (Online) 5th September Morning Slot

MCQ (Single Correct Answer)

If S is the sum of the first 10 terms of the series

$$\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right) + \tan^{-1}\left(\frac{1}{13}\right) + \tan^{-1}\left(\frac{1}{21}\right) + \dots$$

then $\tan(S)$ is equal to :

A $\frac{10}{11}$

B $\frac{5}{11}$

C $-\frac{6}{5}$

D $\frac{5}{6}$

Ans - D

1 JEE Main 2020 (Online) 3rd September Morning Slot

MCQ (Single Correct Answer)

$2\pi - \left(\sin^{-1}\frac{4}{5} + \sin^{-1}\frac{5}{13} + \sin^{-1}\frac{16}{65}\right)$ is equal to :

A $\frac{7\pi}{4}$

B $\frac{5\pi}{4}$

C $\frac{3\pi}{2}$

D $\frac{\pi}{2}$

Ans - C

JEE MAINS 2019 PROBLEM SET : ONLINE

1 JEE Main 2019 (Online) 9th January Morning Slot

MCQ (Single Correct Answer)

If $\cos^{-1}\left(\frac{2}{3x}\right) + \cos^{-1}\left(\frac{3}{4x}\right) = \frac{\pi}{2}$ ($x > \frac{3}{4}$), then x is equal to

A $\frac{\sqrt{145}}{10}$

B $\frac{\sqrt{145}}{11}$

C $\frac{\sqrt{145}}{12}$

D $\frac{\sqrt{146}}{12}$

ANS - C

4 JEE Main 2019 (Online) 9th January Evening Slot

MCQ (Single Correct Answer)

If $x = \sin^{-1}(\sin 10)$ and $y = \cos^{-1}(\cos 10)$, then $y - x$ is equal to :

A 0

B 10

C 7π

D π

ANS - D

3 JEE Main 2019 (Online) 10th January Evening Slot

MCQ (Single Correct Answer)

The value of $\cot\left(\sum_{n=1}^{19} \cot^{-1}\left(1 + \sum_{p=1}^n 2p\right)\right)$ is -

A $\frac{22}{23}$

B $\frac{23}{22}$

C $\frac{21}{19}$

D $\frac{19}{21}$

ANS - C

2 JEE Main 2019 (Online) 11th January Evening Slot

MCQ (Single Correct Answer)

All x satisfying the inequality $(\cot^{-1} x)^2 - 7(\cot^{-1} x) + 10 > 0$, lie in the interval :

- A $(\cot 2, \infty)$
- B $(-\infty, \cot 5) \cup (\cot 2, \infty)$
- C $(\cot 5, \cot 4)$
- D $(-\infty, \cot 5) \cup (\cot 4, \cot 2)$

ANS - A

1 JEE Main 2019 (Online) 12th January Morning Slot

MCQ (Single Correct Answer)

Considering only the principal values of inverse functions, the set

$$A = \{x \geq 0 : \tan^{-1}(2x) + \tan^{-1}(3x) = \frac{\pi}{4}\}$$

- A contains two elements
- B contains more than two elements
- C is an empty set
- D is a singleton

ANS - D

4 JEE Main 2019 (Online) 8th April Morning Slot

MCQ (Single Correct Answer)

If $\alpha = \cos^{-1}\left(\frac{3}{5}\right)$, $\beta = \tan^{-1}\left(\frac{1}{3}\right)$ where $0 < \alpha, \beta < \frac{\pi}{2}$, then $\alpha - \beta$ is equal to

- A $\tan^{-1}\left(\frac{9}{14}\right)$
- B $\sin^{-1}\left(\frac{9}{5\sqrt{10}}\right)$
- C $\cos^{-1}\left(\frac{9}{5\sqrt{10}}\right)$
- D $\tan^{-1}\left(\frac{9}{5\sqrt{10}}\right)$

ANS - B

3 JEE Main 2019 (Online) 10th April Evening Slot

MCQ (Single Correct Answer)

If $\cos^{-1}x - \cos^{-1}\frac{y}{2} = \alpha$, where $-1 \leq x \leq 1$, $-2 \leq y \leq 2$, $x \leq \frac{y}{2}$, then for all x, y , $4x^2 - 4xy \cos \alpha + y^2$ is equal to :

A $4 \sin^2 \alpha$

B $2 \sin^2 \alpha$

C $4 \sin^2 \alpha - 2x^2y^2$

D $4 \cos^2 \alpha + 2x^2y^2$

ANS - A

2 JEE Main 2019 (Online) 12th April Morning Slot

MCQ (Single Correct Answer)

The value of $\sin^{-1}\left(\frac{12}{13}\right) - \sin^{-1}\left(\frac{3}{5}\right)$ is equal to :

A $\pi - \sin^{-1}\left(\frac{63}{65}\right)$

B $\frac{\pi}{2} - \sin^{-1}\left(\frac{56}{65}\right)$

C $\frac{\pi}{2} - \cos^{-1}\left(\frac{9}{65}\right)$

D $\pi - \cos^{-1}\left(\frac{33}{65}\right)$

ANS - B