JEE MAIN 2025
PAPER DISCUSSION

Sub : Mathematics
Attempt : 01
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Shift : 02

LIVE STREAMING

If $2x^2 + (\cos\theta)x - 1 = 0, \theta \in [0, 2\pi]$ has roots α and β. Then the sum of maximum and minimum value of $\alpha^4 + \beta^4$ is

(A) $\frac{25}{16}$

(B) $\frac{9}{16}$

(C) $\frac{41}{16}$

(D) $\frac{8}{17}$

If $\theta \in [0, 2\pi]$ satisfying the system of equations $2\sin^2\theta = \cos 2\theta$ and $2\cos^2\theta = 3\sin\theta$. Then the sum of all real values of θ is

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

B π

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

D $\frac{5\pi}{6}$

Let $A = \{1, 2, 3, 4\}$ and $B = \{1, 4, 9, 16\}$.

If $f : A \to B$, then number of many-one functions from A to B are

(A) 24

(B) 232

(C) 256

(D) 252

4 boys and 3 girls are to be seated in a row such that all girls seat together and two particular boys B_1 and B_2 are not adjacent to each other. Then the number of ways in which this arrangement can be done.

A 432

B 430

C 516

D 1002

Let $\vec{a}$ and $\vec{b}$ be two unit vectors such that angle between $\vec{a}$ and $\vec{b}$ is $\frac{\pi}{3}$. If $\lambda\vec{a} + 3\vec{b}$ and $2\vec{a} + \lambda\vec{b}$ are perpendicular to each other, then the product of all possible values of λ is ________

Consider a function $f(x) = \int_0^{x^2} \frac{t^2 - 8t + 15}{e^t} dt$. The number of points of extrema are

(A) 3

(B) 5

(C) 7

(D) 9

If the mean deviation about median for the number 3, 5, 7, $2k$, 12, 16, 21, 24 arranged in ascending order is 6 then the median is

$f(y)$ is the solution of differential equation

$(1+y^2)+(x-2\tan^{-1}y)\dfrac{dy}{dx}=0, f(0)=1,$ find $f\left(\dfrac{1}{\sqrt{3}}\right)$.

If the sum $\sum_{r=1}^{30} \frac{r^2\left({}^{30}C_r\right)^2}{{}^{30}C_{r-1}} = \alpha \cdot 2^{29}$, then $\alpha =$

(A) 225

(B) 465

(C) 345

(D) 425

$A : \{1, 2, 3\}$, find the number of relations which are transitive and reflexive but not symmetric and contain $(1, 2)$ and $(2, 3)$.

If A is a 3×3 matrix and $|A|$ is $1/2$ and trace $(A) = 3$ and $B = \text{adj}\,(\text{adj}\,(2A))$ then find the value of $|B|$ + trace (B).

Let A and B are two events such that $P(A \cap B) = \frac{1}{10}$ and $P(A/B)$ and $P(B/A)$ are the roots of the equation $12x^2 - 7x + 1 = 0$, then $\frac{P(\bar{A} \cup \bar{B})}{P(\bar{A} \cap \bar{B})}$ is equal to

A. $\frac{4}{9}$

B. $\frac{9}{4}$

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

D. $\frac{2}{3}$

Number of terms in an arithmetic progression is $2n$. Sum of terms occurring at even places is 40 and sum of terms occurring at odd places is 55. If the first term exceeds the last term by 27, then n equals to

(A) 3

(B) 5

(C) 7

(D) 4

Perpendicular distance from the point $P(-2, 0, 2)$ to the line $\frac{x+1}{2} = \frac{y-1}{-1} = \frac{z+3}{2}$

Area bounded by the curves $y = x^2 + 4x + 4$, $y^2 = 16 - 8x$, is:

A 5

B $8/3$

C $4/3$

D 8

$x + y + 2z = 6, 2x + 3y + az = a + 1, -x - 3y + bz = 2b$ has infinitely many solutions then $7a + 3b =$

The perpendicular distance of point $P(3,4,5)$ from the line $\hat{r}^2 = 2\hat{\imath} - \hat{\jmath} + \hat{k} + \lambda(4\hat{\imath} - \hat{\jmath} + 5\hat{k})$ is

A $\sqrt{\frac{19}{42}}$

B $\sqrt{\frac{19}{21}}$

C $\sqrt{\frac{42}{19}}$

D $\sqrt{\frac{21}{19}}$

In the expansion of $\left(x+\sqrt{x^3-1}\right)^5+\left(x-\sqrt{x^3-1}\right)^5$,where α, β, γ and δ are the coefficient x^3, x^5 and x^7 respectively. If $\alpha u-\beta v=18$ and $\gamma u+\delta v=20$, then $u+v$ is equal to

A. $\frac{-14}{15}$

B. $\frac{-13}{15}$

C. $\frac{-3}{5}$

D. $\frac{-2}{3}$

Thank

YOU