

JEE-Main-04-04-2024 (Memory Based)
[EVENINGSHIFT]

Maths

Question: Team A has 4 men and 5 women. Team B has 4 women and 5 men. In how many ways can we pick 4 from each team such that there are 4 men and 4 women (integer type question)

Answer: 5626

Question: $\frac{1 \times 2^2 + 2 \times 3^2 + 3 \times 4^2 + \dots + 100 \times 101^2}{1^2 \times 2 + 2^2 \times 3 + 3^2 \times 4 + \dots + 100^2 \times 101} =$

Options:

- (a) 305/302
- (b) 305/301
- (c) 301/305
- (d) 302/301

Answer: (b)

Question:

$$\int_{-1}^1 \frac{\cos ax}{(1+3^x)} dx = \frac{2}{\pi}$$

Find a

Options:

- (a) $\pi/4$
- (b) $\pi/3$
- (c) $\pi/2$
- (d) $\pi/5$

Answer: (c)

Question: Coeff of x^4, x^5, x^6 was in AP in expansion of $(1+x)^n$ Find maxm

Options:

- (a) 14
- (b) 7
- (c) 21
- (d) 0

Answer: (a)

Question: a, b, c in A.P., a, b, c AM was 8, find the cube of their GM such that a+1, b, c+3 were in GP

Options:

- (a) 120
- (b) 240
- (c) 360
- (d) 540

Answer: (a)

Question: If $\cos^{-1} x - \sin^{-1} y = \theta$ Find minimum of $x^2 + y^2 + 2xy \sin\theta$

Options:

- (a) 0
- (b) 1
- (c) 2
- (d) 3

Answer: (a)

Question: Let $y = y(x)$ be the solution of differential equation $(x^2 + 4)2dy + (2x^3y + 8xy - 2)dx = 0$ If $y(0) = 0$, then $y(2)$ is equal to.

Options:

- (a) $\pi/2$
- (b) $\pi/4$
- (c) $\pi/8$
- (d) $\pi/32$

Answer: (d)

Question: Let

$$A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$$

and $B = I + \text{adj}(A) + \text{adj}(A) + (\text{adj } A)^2 + (\text{adj } A)^{10}$. Then the sum

of all elements of the matrix B is -

Options:

- (a) 88
- (b) -88
- (c) 99
- (d) -99

Answer: (b)

Question: A parabola $y^2 = 12x$ has a chord PQ with PQ with mid-point $(4, 1)$ then equation of PQ passes through:

Options:

- (a) $\left(\frac{1}{2}, -20\right)$
- (b) $\left(\frac{1}{2}, -10\right)$
- (c) $\left(-10, -\frac{1}{2}\right)$
- (d) $\left(-10, \frac{1}{2}\right)$

Answer: (a)

Question: The area (in sq. units) of the region described by $\{(x, y): y^2 \leq 2x, \text{ and } y \geq 4x - 1\}$ is

Options:

- (a) 9/31
- (b) 8/33
- (c) 9/32
- (d) 2/31

Answer: (c)

Question: A relation defined as $(x_1, y_1) R(x_2, y_2): x_1 \leq x_2 \ \& \ y_1 \leq y_2$ and given that

- (a) R is reflexive but not symmetric
- (b) R is transitive . Then,

Options:

- (a) (a) is true and (b) is false
- (b) (a) is false and (b) is true
- (c) Both (a) and (b) are true
- (d) Both (a) and (b) are false

Answer: (c)

Question: Let $\bar{a} = \hat{i} + \hat{j} + \hat{k}, \bar{b} = 2\hat{i} + 4\hat{j} - 5\hat{k}$ and

$\bar{c} = x\hat{i} + 2\hat{j} + 3\hat{k}, x \in R$, If \bar{d} is unit vector in the direction $\bar{b} + \bar{c}$ of such that $\bar{a} \cdot \bar{d} = 1$, then $(\bar{a} \times \bar{b}) \cdot \bar{c}$ is equal to

Options:

- (a) 9
- (b) 10
- (c) 11
- (d) 12

Answer: (c)

Question: Let P be the POI of the lines, find the distance of P from the given plane

$$\frac{x-2}{1} = \frac{y-4}{5} = \frac{z-2}{1}, \quad \frac{x-2}{2} = \frac{y-2}{3} = \frac{z-3}{2}$$

$$4x = 2y = z$$

Options:

- (a)
- (b)
- (c)
- (d)

Answer: (d)

Question: Let

$$f(x) = \int_0^x t + \sin(1 - e^t) dt, f(0) = 0, \text{ then } \lim_{x \rightarrow 0} \frac{f(x)}{x^3}$$

Options:

- (a) 1/6
- (b) -1/6
- (c) 1/2
- (d) -1/2

Answer: (b)

Question: If

$$f(x) = 3\sqrt{x-2} + \sqrt{4-x}$$

maximum value α and minimum value is β , then $\alpha^2 + \beta^2$

Options:

(a) 20

(b) 21

(c) 22

(d) 23

Answer: (c)

