

JEE Main April 2026
Question Paper With Text Solution
05 April | Shift-2

MATHEMATICS



JEE Main & Advanced | XI-XII Foundation | VI-X Pre-Foundation

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**JEE MAIN APRIL 2026 | 5TH APRIL SHIFT-2****SECTION - A**

Question ID : 691121451

1. Let α, β be the roots of the equation $x^2 - x + p = 0$ and γ, δ be the roots the equation $x^2 - 4x + q = 0$; $p, q \in \mathbb{Z}$. If $\alpha, \beta, \gamma, \delta$ are in G.P., then $|p + q|$ equals :

- (1) 16 (2) 32 (3) 34 (4) 38

Ans. (3)**Sol.**

Question ID : 691121452

2. Let $z_1, z_2 \in \mathbb{C}$ be the distinct solutions of the equation $z^2 + 4z - (1 + 12i) = 0$. Then $|z_1|^2 + |z_2|^2$ is equal to:

- (1) 18 (2) 22 (3) 29 (4) 34

Ans. (4)**Sol.**

Question ID : 691121453

3. If $f: \mathbb{N} \rightarrow \mathbb{Z}$ is defined by $f(n) = \begin{vmatrix} n & -1 & -5 \\ -2n^2 & 3(2k+1) & 2k+1 \\ -3n^3 & 3k(2k+1) & 3k(k+2)+1 \end{vmatrix}, k \in \mathbb{N}$, and $\sum_{n=1}^k f(n) = 98$. then k is

equal to :

- (1) 3 (2) 4 (3) 5 (4) 6

Ans. (1)**Sol.**

Question ID : 691121454

4. Let M be a 3×3 matrix such that $M \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}, M \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 2 \end{pmatrix}$ and $M \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} -1 \\ 1 \\ 1 \end{pmatrix}$. If $M \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ 7 \\ 11 \end{pmatrix}$, then

 $x + y + z$ equals :**MATRIX JEE ACADEMY****Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911****Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in**



(1) 4

(2) 5

(3) 7

(4) 11

Ans. (2)**Sol.**

Question ID : 691121455

5. If the sum of the first 10 terms of the series $\frac{1}{1+1^4 \times 4} + \frac{2}{1+2^4 \times 4} + \frac{3}{1+3^4 \times 4} + \dots$ is $\frac{m}{n}$ $\gcd(m, n) = 1$, then $m + n$ is equal to :

(1) 256

(2) 264

(3) 276

(4) 284

Ans. (3)**Sol.**

Question ID : 691121456

6. Let $A_1, A_2, A_3, \dots, A_{39}$ be 39 arithmetic means between the numbers 59 and 159. Then the mean of A_{25}, A_{28}, A_{31} and A_{36} is equal to :

(1) 129

(2) 136

(3) 131.50

(4) 134

Ans. (4)**Sol.**

Question ID : 691121457

7. The coefficient of x^2 in the expansion of $\left(2x^2 + \frac{1}{x}\right)^{10}$, $x \neq 0$, is :

(1) 3240

(2) 3360

(3) 3480

(4) 3600

Ans. (2)**Sol.**

Question ID : 691121458

8. The probabilities that players A and B of a team are selected for the captaincy for a tournament are 0.6 and 0.4, respectively. If A is selected the captain, the probability that the team wins the tournament is 0.8 and if B is selected the captain, the probability that the team wins the tournament is 0.7. Then the probability, that the team wins the tournament, is :

(1) 0.74

(2) 0.76

(3) 0.72

(4) 0.78

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Ans. (2)

Sol.

Question ID : 691121459

9. A box contains 5 blue, 6 yellow and 4 red balls. The number of ways, of drawing 8 balls containing at least two balls of each colour, is :

- (1) 4100 (2) 4140 (3) 4230 (4) 4290

Ans. (1)

Sol.

Question ID : 691121460

10. A variable X takes values $0, 0, 2, 6, 12, 20, \dots, n(n-1)$ with frequencies ${}^n C_0, {}^n C_1, {}^n C_2, {}^n C_3, {}^n C_4, {}^n C_5, \dots, {}^n C_n$ respectively. If the mean of this data is 60, then its median is :

- (1) 56 (2) 42 (3) 72 (4) 90

Ans. (1)

Sol.

Question ID : 691121461

11. Let the point P be the vertex of the parabola $y = x^2 - 6x + 12$. If a line passing through the point P intersects the circle $x^2 + y^2 - 2x - 4y + 3 = 0$ at the points R and S , then the maximum value of $(PR+PS)^2$ is :

- (1) 10 (2) 20 (3) 25 (4) 5

Ans. (2)

Sol.

Question ID : 691121462

12. Let the directrix of the parabola $P : y^2 = 8x$, cut x -axis at the point A . Let $B(\alpha, \beta), \alpha > 1$, be a point on P such that the slope of AB is $3/5$. If BC is a focal chord of P , then six times the area of ΔABC is :

- (1) 80 (2) 160 (3) 174 (4) 192

Ans. (2)

Sol.

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Question ID : 691121463

13. Let the eccentricity e of a hyperbola satisfy the equation $6e^2 - 11e + 3 = 0$. If the foci of the hyperbola are $(3, 5)$ and $(3, 4)$, then the length of its latus rectum is :

- (1) $\frac{11}{3}$ (2) $\frac{17}{3}$ (3) $\frac{15}{2}$ (4) $\frac{17}{2}$

Ans. (3)**Sol.**

Question ID : 691121464

14. Let a triangle PQR be such that P and Q lie on the line $\frac{x+3}{8} = \frac{y-4}{2} = \frac{z+1}{2}$ and are at a distance of 6 units from R $(1, 2, 3)$. If (α, β, γ) is the centroid of ΔPQR , then $\alpha + \beta + \gamma$ is equal to :

- (1) 4 (2) 5 (3) 6 (4) 8

Ans. (3)**Sol.**

Question ID : 691121465

15. If the distance of the point $(a, 2, 5)$ from the image of the point $(1, 2, 7)$ in the line $\frac{x}{1} = \frac{y-1}{1} = \frac{z-2}{2}$ is 4, then the sum of all possible values of a is equal to :

- (1) 11 (2) 9 (3) 6 (4) 4

Ans. (3)**Sol.**

Question ID : 691121466

16. Let O be the origin, $\overrightarrow{OP} = \vec{a}$ and $\overrightarrow{OQ} = \vec{b}$. If R is the point on \overrightarrow{OP} such that $\overrightarrow{OP} = 5\overrightarrow{OR}$, and M is the point such that $\overrightarrow{OQ} = 5\overrightarrow{RM}$, then \overrightarrow{PM} is equal to :

- (1) $\frac{1}{5}(\vec{a} - 4\vec{b})$ (2) $\frac{1}{5}(\vec{b} - 4\vec{a})$ (3) $\frac{1}{5}(-\vec{a} + 4\vec{b})$ (4) $\frac{1}{5}(-\vec{b} + 4\vec{a})$

Ans. (2)

**Sol.**

Question ID : 691121467

17. Let $f(x) = \lim_{y \rightarrow 0} \frac{(1 - \cos(xy)) \tan(xy)}{y^3}$. Then the number of solutions of the equation $f(x) = \sin x$, $x \in \mathbb{R}$:

- (1) 2 (2) 2 (3) 3 (4) 1

Ans. (3)**Sol.**

Question ID : 691121468

18. Let $(2^{1-a} + 2^{1+a})$, $f(a)$ $(3^a + 3^{-a})$ be in A.P. and α be the minimum value of $f(a)$. Then the value of the integral

$$\int_{\log_e(\alpha-1)}^{\log_e(\alpha)} \frac{dx}{(e^{2x} - e^{-2x})}$$
 is :

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

Ans. (1)**Sol.**

Question ID : 691121469

19. Let $f : [1, \infty) \rightarrow \mathbb{R}$ be a differentiable function defined as $f(x) = \int_1^x f(t) dt + (1-x)(\ln x - 1) + e$. Then the value of $f(f(1))$ is :

- (1) $(1 + e^e)$ (2) $(1 + e)$ (3) $(1 + e + e^e)$ (4) $1 + 2e$

Ans. (1)**Sol.**

Question ID : 691121470

20. Let $f(x)$ and $g(x)$ be twice differentiable functions satisfying $f''(x) = g''(x)$ for all $x \in \mathbb{R}$, $f'(1) = 2g'(1) = 4$ and $g(2) = 3f(2) = 9$. Then $f(25) - g(25)$ is equal to :

- (1) 20 (2) 40 (3) -20 (4) -40

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Ans. (2)

Sol.

SECTION – B

Question ID : 691121471

21. Let $A = \{1, 4, 7\}$ and $B = \{2, 3, 8\}$. Then the number of elements, in the relation $R = \{((a_1, b_1), (a_2, b_2)) \in ((A \times B) \times (A \times B)) : a_1 + b_2 \text{ divides } a_2 + b_1\}$ is _____.

Ans. (18)

Sol.

Question ID : 691121472

22. From the point $(-1, -1)$, two rays are sent making angles of 45° with the line $x + y = 0$. These rays get reflected from the mirror $x + 2y = 1$. If the equations of the reflected rays are $ax + by = 9$ and $cx + dy = 7$, $a, b, c, d \in \mathbb{Z}$, then the value of $ad + bc$ is _____.

Ans. (121)

Sol.

Question ID : 691121473

23. If $S = \left\{ \theta \in [-\pi, \pi] : \cos \theta \cos \frac{5\theta}{2} = \cos 7\theta \cos \frac{7\theta}{2} \right\}$ then $n(S)$ is equal to _____.

Ans. (19)

Sol.

Question ID : 691121474

24. Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be a function such that $f(x) + 3f\left(\frac{\pi}{2} - x\right) = \sin x, x \in \mathbb{R}$. Let the maximum value of f on \mathbb{R} be

α . If the area of the region bounded by the curves $g(x) = x^2$ and $h(x) = \beta x^3, \beta > 0$, is α^2 , then $30\beta^3$ is equal to _____.

Ans. (16)

Sol.



Question ID : 691121475

25. Let $y = y(x)$ be the solution of the differential equation $(\tan x)^{1/2} dy = (\sec^3 x - (\tan)^{3/2} y) dx$,

$0 < x < \frac{\pi}{2}$, $y\left(\frac{\pi}{4}\right) = \frac{6\sqrt{2}}{5}$. If $y\left(\frac{\pi}{3}\right) = \frac{4}{5}\alpha$ then α^4 equals _____.

Ans. (48)

Sol.

