



A Premier Institute for Pre-Medical & Pre Engineering

**SRI VIDYA
ARADHANA
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NEET/JEE

Topic: Target JEE 2027

Mathematics

Revision Week - 03

Chetan Sir

Monday 22nd June

Q1. JEE Main 2024

Let A be a non-singular matrix of order 3. If $\det(3 \operatorname{adj}(2 \operatorname{adj}((\det A)A))) = 3^{-13} \cdot 2^{-10}$ and $\det(3 \operatorname{adj}(2A)) = 2^m \cdot 3^n$, then $|3m + 2n|$ is equal to _____.

Q2. JEE Main 2024

The number of elements in the set $S = \{(x, y, z) : x, y, z \in \mathbb{Z}, x + 2y + 3z = 42, x, y, z \geq 0\}$ equals _____.

Q3. JEE Main 2024

If 2 and 6 are the roots of the equation $ax^2 + bx + 1 = 0$, then the quadratic equation, whose roots are $\frac{1}{2a+b}$ and $\frac{1}{6a+b}$, is :

- (A) $x^2 + 8x + 12 = 0$ (B) $2x^2 + 11x + 12 = 0$
(C) $4x^2 + 14x + 12 = 0$ (D) $x^2 + 10x + 16 = 0$

Q4. JEE Main 2024

The coefficient of x^{70} in $x^2(1+x)^{98} + x^3(1+x)^{97} + x^4(1+x)^{96} + \dots + x^{54}(1+x)^{46}$ is ${}^{99}C_p - {}^{46}C_q$. Then a possible value of $p + q$ is :

- (A) 61 (B) 83 (C) 55 (D) 68

Q5. JEE Main 2024

Let $\alpha \in (0, \infty)$ and $A = \begin{bmatrix} 1 & 2 & \alpha \\ 1 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}$. If $\det(\operatorname{adj}(2A - A^T) \cdot \operatorname{adj}(A - 2A^T)) = 2^8$, then $(\det(A))^2$ is equal to:

- (A) 16 (B) 36 (C) 49 (D) 1

Q6. JEE Main 2024

The number of common terms in the progressions 4, 9, 14, 19, ..., up to 25th term and 3, 6, 9, 12, ..., up to 37th term is :

- (A) 9 (B) 8 (C) 5 (D) 7

Q7. JEE Main 2024

There are 5 points P_1, P_2, P_3, P_4, P_5 on the side AB , excluding A and B , of a triangle ABC . Similarly there are 6 points $P_6, P_7, \dots, P_{11}$ on the side BC and 7 points $P_{12}, P_{13}, \dots, P_{18}$ on the side CA of the triangle. The number of triangles, that can be formed using the points $P_1, P_2, \dots, P_{18}$ as vertices, is:

- (A) 751 (B) 776
(C) 796 (D) 771

Q8. JEE Main 2024

If $\sin x = -\frac{3}{5}$, where $\pi < x < \frac{3\pi}{2}$, then $80(\tan^2 x - \cos x)$ is equal to

- (A) 109 (B) 108 (C) 19 (D) 18

Q9. JEE Main 2024

If the system of equations $x + (\sqrt{2} \sin \alpha)y + (\sqrt{2} \cos \alpha)z = 0$
 $x + (\cos \alpha)y + (\sin \alpha)z = 0$
 $x + (\sin \alpha)y - (\cos \alpha)z = 0$

has a non-trivial solution, then $\alpha \in (0, \frac{\pi}{2})$ is equal to :

- (A) $\frac{5\pi}{24}$ (B) $\frac{11\pi}{24}$ (C) $\frac{7\pi}{24}$ (D) $\frac{3\pi}{4}$

Q10. JEE Main 2024

If $8 = 3 + \frac{1}{4}(3+p) + \frac{1}{4^2}(3+2p) + \frac{1}{4^3}(3+3p) + \dots \infty$, then the value of p is _____.

Tuesday 23rd June

Q11. JEE Main 2024

The remainder when 428^{2024} is divided by 21 is _____.

Q12. JEE Main 2024

The sum of all the solutions of the equation $(8)^{2x} - 16 \cdot (8)^x + 48 = 0$ is :

- (A) $1 + \log_8(6)$ (B) $1 + \log_6(8)$
(C) $\log_8(6)$ (D) $\log_8(4)$

Q13. JEE Main 2024

Let A be a square matrix of order 2 such that $|A| = 2$ and the sum of its diagonal elements is -3 . If the points (x, y) satisfying $A^2 + xA + yI = O$ lie on a hyperbola, whose transverse axis is parallel to the x -axis, eccentricity is e and the length of the latus rectum is l , then $e^4 + l^4$ is equal to _____.

Q14. JEE Main 2024

If $\alpha, -\frac{\pi}{2} < \alpha < \frac{\pi}{2}$ is the solution of $4 \cos \theta + 5 \sin \theta = 1$, then the value of $\tan \alpha$ is

- (A) $\frac{10-\sqrt{10}}{12}$
(B) $\frac{\sqrt{10}-10}{6}$
(C) $\frac{\sqrt{10}-10}{12}$
(D) $\frac{10-\sqrt{10}}{6}$

Q15. JEE Main 2024

If the sum of the series $\frac{1}{1 \cdot (1+d)} + \frac{1}{(1+d)(1+2d)} + \dots + \frac{1}{(1+9d)(1+10d)}$ is equal to 5, then $50d$ is equal to :

- (A) 5
(B) 10
(C) 15
(D) 20

Q16. JEE Main 2024

Let $[t]$ be the greatest integer less than or equal to t . Let A be the set of all prime factors of 2310 and $f: A \rightarrow \mathbb{Z}$ be the function $f(x) = \left[\log_2 \left(x^2 + \left[\frac{x^3}{5} \right] \right) \right]$. The number of one-to-one functions from A to the range of f is

- (A) 20 (B) 120 (C) 25 (D) 24

Q17. JEE Main 2024

Let A be a 3×3 matrix of non-negative real elements such that $A \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = 3 \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$. Then the maximum value of $\det(A)$ is _____.

Q18. JEE Main 2024

Let the first three terms 2, p and q , with $q \neq 2$, of a G.P. be respectively the 7th, 8th and 13th terms of an A.P. If the 5th term of the G.P. is the n th term of the A.P., then n is equal to:

- (A) 151 (B) 177 (C) 163 (D) 169

Q19. JEE Main 2024

The sum of all rational terms in the expansion of $\left(2^{\frac{1}{5}} + 5^{\frac{1}{3}} \right)^{15}$ is equal to :

- (A) 633 (B) 6131 (C) 3133 (D) 931

Q20. JEE Main 2024

The number of distinct real roots of the equation $|x||x+2| - 5|x+1| - 1 = 0$ is _____.

Wednesday 24th June

Q21. JEE Main 2024

Let $A = \begin{bmatrix} 2 & a & 0 \\ 1 & 3 & 1 \\ 0 & 5 & b \end{bmatrix}$. If $A^3 = 4A^2 - A - 21I$, where I is the identity matrix of order 3×3 , then $2a + 3b$ is equal to
(A) -10 (B) -12 (C) -13 (D) -9

Q22. JEE Main 2024

Let $\alpha = \sum_{r=0}^n (4r^2 + 2r + 1) {}^nC_r$ and $\beta = \left(\sum_{r=0}^n \frac{{}^nC_r}{r+1} \right) + \frac{1}{n+1}$. If $140 < \frac{2\alpha}{\beta} < 281$, then the value of n is _____.

Q23. JEE Main 2024

The number of 3-digit numbers, formed using the digits 2, 3, 4, 5 and 7, when the repetition of digits is not allowed, and which are not divisible by 3, is equal to _____.

Q24. JEE Main 2024

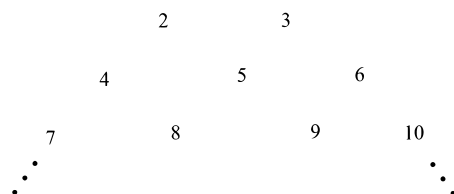
Let $A = \begin{bmatrix} 2 & -1 \\ 1 & 1 \end{bmatrix}$. If the sum of the diagonal elements of A^{13} is 3^n , then n is equal to _____.

Q25. JEE Main 2024

Let $a = 1 + \frac{{}^2C_2}{3!} + \frac{{}^3C_2}{4!} + \frac{{}^4C_2}{5!} + \dots$, $b = 1 + \frac{{}^1C_0 + {}^1C_1}{1!} + \frac{{}^2C_0 + {}^2C_1 + {}^2C_2}{2!} + \frac{{}^3C_0 + {}^3C_1 + {}^3C_2 + {}^3C_3}{3!} + \dots$. Then $\frac{2b}{a^2}$ is equal to _____.

Q26. JEE Main 2024

Let the positive integers be written in the form :



If the k^{th} row contains exactly k numbers for every natural number k , then the row in which the number 5310 will be, is _____.

Q27. JEE Main 2024

Let A and B be two square matrices of order 3 such that $|A| = 3$ and $|B| = 2$. Then $|A^T A (\text{adj}(2A))^{-1} (\text{adj}(4B)) (\text{adj}(AB))^{-1} A A^T|$ is equal to :
(A) 32 (B) 81 (C) 64 (D) 108

Q28. JEE Main 2024

Let α, β be the distinct roots of the equation $x^2 - (t^2 - 5t + 6)x + 1 = 0, t \in \mathbb{R}$ and $a_n = \alpha^n + \beta^n$. Then the minimum value of $\frac{a_{2023} + a_{2025}}{a_{2024}}$ is
(A) $-1/2$ (B) $-1/4$ (C) $1/4$ (D) $1/2$

