



A Premier Institute for Pre-Medical & Pre Engineering

**SRI VIDYA
ARADHANA
ACADEMY**
"Transforming Your DREAMS Into Reality...!"**NEET/JEE**
Topic: Target JEE 2027

Mathematics

Revision Week 05

Chetan Sir

*"The future belongs to those who prepare for it today, quietly, while no one is watching."***MONDAY 20TH JULY**

- The number of solutions of the equation $\left(\frac{9}{x} - \frac{9}{\sqrt{x}} + 2\right)\left(\frac{2}{x} - \frac{7}{\sqrt{x}} + 3\right) = 0$ is : [JEE Main 2025]
(A) 3 (B) 2 (C) 1 (D) 4
- If $\sum_{r=1}^{30} \frac{r^2 \binom{30}{r}}{\binom{30}{r-1}} = \alpha \times 2^{29}$, then α is equal to [JEE Main 2025]
- The number of natural numbers, between 212 and 999, such that the sum of their digits is 15, is [JEE Main 2025]
- If $\sin x + \sin^2 x = 1$, $x \in (0, \frac{\pi}{2})$, then $(\cos^{12} x + \tan^{12} x) + 3(\cos^{10} x + \tan^{10} x + \cos^8 x + \tan^8 x) + (\cos^6 x + \tan^6 x)$ is equal to: [JEE Main 2025]
(A) 3 (B) 4 (C) 2 (D) 1
- The interior angles of a polygon with n sides, are in an A.P. with common difference 6° . If the largest interior angle of the polygon is 219° , then n is equal to [JEE Main 2025]
- Suppose that the number of terms in an A.P. is $2k$, $k \in \mathbb{N}$. If the sum of all odd terms of the A.P. is 40, the sum of all even terms is 55 and the last term of the A.P. exceeds the first term by 27, then k is equal to: [JEE Main 2025]
(A) 8 (B) 6 (C) 4 (D) 5
- Let $A(a, b)$, $B(3, 4)$ and $C(-6, -8)$ respectively denote the centroid, circumcentre and orthocentre of a triangle. Then, the distance of the point $P(2a + 3, 7b + 5)$ from the line $2x + 3y - 4 = 0$ measured parallel to the line $x - 2y - 1 = 0$ is [JEE Main 2024]
(A) $\frac{17\sqrt{5}}{6}$ (B) $\frac{15\sqrt{5}}{7}$ (C) $\frac{17\sqrt{5}}{7}$ (D) $\frac{\sqrt{5}}{17}$
- Let $A(-2, -1)$, $B(1, 0)$, $C(\alpha, \beta)$ and $D(\gamma, \delta)$ be the vertices of a parallelogram $ABCD$. If the point C lies on $2x - y = 5$ and the point D lies on $3x - 2y = 6$, then the value of $|\alpha + \beta + \gamma + \delta|$ is equal to [JEE Main 2024]
- If one of the diameters of the circle $x^2 + y^2 - 10x + 4y + 13 = 0$ is a chord of another circle C , whose center is the point of intersection of the lines $2x + 3y = 12$ and $3x - 2y = 5$, then the radius of the circle C is : [JEE Main 2024]
(A) 4 (B) $3\sqrt{2}$ (C) 6 (D) $\sqrt{20}$
- Equations of two diameters of a circle are $2x - 3y = 5$ and $3x - 4y = 7$. The line joining the points $(-\frac{22}{7}, -4)$ and $(-\frac{1}{7}, 3)$ intersects the circle at only one point $P(\alpha, \beta)$. Then, $17\beta - \alpha$ is equal to [JEE Main 2024]

TUESDAY 21ST JULY

- If the set of all $a \in \mathbb{R}$, for which the equation $2x^2 + (a - 5)x + 15 = 3a$ has no real root, is the interval (α, β) , and $X = \{x \in \mathbb{Z}; \alpha < x < \beta\}$, then $\sum_{x \in X} x^2$ is equal to: [JEE Main 2025]
(A) 2139 (B) 2119 (C) 2109 (D) 2129

12. Let $\alpha, \beta, \gamma, \delta$ be the coefficients of x^7, x^5, x^3, x respectively in the expansion of $(x + \sqrt{x^3 - 1})^5 + (x - \sqrt{x^3 - 1})^5$, $x > 1$. If u and v satisfy $\alpha u + \beta v = 18$ and $\gamma u + \delta v = 20$, then $u + v$ equals : [JEE Main 2025]
 (A) 4 (B) 3 (C) 5 (D) 8
13. In a group of 3 girls and 4 boys, there are two boys B_1 and B_2 . The number of ways, in which these girls and boys can stand in a queue such that all the girls stand together, all the boys stand together, but B_1 and B_2 are not adjacent to each other, is : [JEE Main 2025]
 (A) 120 (B) 96 (C) 72 (D) 144
14. The sum of all values of $\theta \in [0, 2\pi]$ satisfying $2 \sin^2 \theta = \cos 2\theta$ and $2 \cos^2 \theta = 3 \sin \theta$ is [JEE Main 2025]
 (A) π (B) $\frac{5\pi}{6}$ (C) $\frac{\pi}{2}$ (D) 4π
15. If the first term of an A.P. is 3 and the sum of its first four terms is equal to one-fifth of the sum of the next four terms, then the sum of the first 20 terms is equal to [JEE Main 2025]
 (A) -120 (B) -1200 (C) -1080 (D) -1020
16. The roots of the quadratic equation $3x^2 - px + q = 0$ are 10^{th} and 11^{th} terms of an arithmetic progression with common difference $\frac{3}{2}$. If the sum of the first 11 terms of this arithmetic progression is 88, then $q - 2p$ is equal to ----- . [JEE Main 2025]
17. Let $\alpha, \beta, \gamma, \delta \in \mathbb{Z}$ and let $A(\alpha, \beta), B(1, 0), C(\gamma, \delta)$ and $D(1, 2)$ be the vertices of a parallelogram ABCD. If $AB = \sqrt{10}$ and the points A and C lie on the line $3y = 2x + 1$, then $2(\alpha + \beta + \gamma + \delta)$ is equal to [JEE Main 2024]
 (A) 8 (B) 5 (C) 12 (D) 10
18. In a $\triangle ABC$, suppose $y = x$ is the equation of the bisector of the angle B and the equation of the side AC is $2x - y = 2$. If $2AB = BC$ and the points A and B are respectively (4, 6) and (α, β) , then $\alpha + 2\beta$ is equal to [JEE Main 2024]
 (A) 42 (B) 39 (C) 48 (D) 45
19. Let the locus of the midpoints of the chords of the circle $x^2 + (y - 1)^2 = 1$ drawn from the origin intersect the line $x + y = 1$ at P and Q. Then, the length of PQ is : [JEE Main 2024]
 (A) $\frac{1}{2}$ (B) 1 (C) $\frac{1}{\sqrt{2}}$ (D) $\sqrt{2}$
20. Let $C : x^2 + y^2 = 4$ and $C' : x^2 + y^2 - 4\lambda x + 9 = 0$ be two circles. If the set of all values of λ so that the circles C and C intersect at two distinct points, is $R = [a, b]$, then the point $(8a + 12, 16b - 20)$ lies on the curve : [JEE Main 2024]
 (A) $x^2 + 2y^2 - 5x + 6y = 3$ (B) $5x^2 - y = -11$
 (C) $x^2 - 4y^2 = 7$ (D) $6x^2 + y^2 = 42$

WEDNESDAY 22ND JULY

21. Let $f : \mathbb{R} - \{0\} \rightarrow (-\infty, 1)$ be a polynomial of degree 2, satisfying $f(x)f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right)$. If $f(K) = -2K$, then the sum of squares of all possible values of K is : [JEE Main 2025]
 (A) 9 (B) 1 (C) 6 (D) 7
22. The sum of all rational terms in the expansion of $(1 + 2^{1/3} + 3^{1/2})^6$ is equal to [JEE Main 2025]
23. The number of words, which can be formed using all the letters of the word "DAUGHTER", so that all the vowels never come together, is : [JEE Main 2025]
 (A) 34000 (B) 37000 (C) 35000 (D) 36000
24. Let $S_n = \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \dots$ upto n terms. If the sum of the first six terms of an A.P. with first term -p and common difference p is $\sqrt{2026} S_{2025}$, then the absolute difference between 20^{th} and 15^{th} terms of the A.P. is [JEE Main 2025]
 (A) 20 (B) 45 (C) 90 (D) 25
25. In an arithmetic progression, if $S_{40} = 1030$ and $S_{12} = 57$, then $S_{30} - S_{10}$ is equal to : [JEE Main 2025]
 (A) 525 (B) 505 (C) 510 (D) 515

26. Let A be the point of intersection of the lines $3x + 2y = 14$, $5x - y = 6$ and B be the point of intersection of the lines $4x + 3y = 8$, $6x + y = 5$. The distance of the point $P(5, -2)$ from the line AB is [JEE Main 2024]
 (A) $\frac{13}{2}$ (B) 8 (C) $\frac{5}{2}$ (D) 6
27. The distance of the point $(2, 3)$ from the line $2x - 3y + 28 = 0$, measured parallel to the line $\sqrt{3}x - y + 1 = 0$, is equal to [JEE Main 2024]
 (A) $3 + 4\sqrt{2}$ (B) $6\sqrt{3}$ (C) $4 + 6\sqrt{3}$ (D) $4\sqrt{2}$
28. Let ABC be an isosceles triangle in which A is at $(-1, 0)$, $\angle A = \frac{2\pi}{3}$, $AB = AC$ and B is on the positive x-axis. If $BC = 4\sqrt{3}$ and the line BC intersects the line $y = x + 3$ at (α, β) , then $\frac{\beta^4}{\alpha^2}$ is [JEE Main 2024]
29. Four distinct points $(2k, 3k)$, $(1, 0)$, $(0, 1)$ and $(0, 0)$ lie on a circle for k equal to : [JEE Main 2024]
 (A) $\frac{3}{13}$ (B) $\frac{2}{13}$ (C) $\frac{5}{13}$ (D) $\frac{1}{13}$
30. Let a circle passing through $(2, 0)$ have its centre at the point (h, k) . Let (x_c, y_c) be the point of intersection of the lines $3x + 5y = 1$ and $(2 + c)x + 5c^2y = 1$. If $h = \lim_{c \rightarrow 1} x_c$ and $k = \lim_{c \rightarrow 1} y_c$, then the equation of the circle is : [JEE Main 2024]
 (A) $5x^2 + 5y^2 - 4x - 2y - 12 = 0$ (B) $25x^2 + 25y^2 - 20x + 2y - 60 = 0$
 (C) $25x^2 + 25y^2 - 2x + 2y - 60 = 0$ (D) $5x^2 + 5y^2 - 4x + 2y - 12 = 0$

THURSDAY 23RD JULY

31. Let α_θ and β_θ be the distinct roots of $2x^2 + (\cos \theta)x - 1 = 0$, $\theta \in (0, 2\pi)$. If m and M are the minimum and the maximum values of $\alpha_\theta^4 + \beta_\theta^4$, then $16(M + m)$ equals : [JEE Main 2025]
 (A) 27 (B) 17 (C) 25 (D) 24
32. If in the expansion of $(1 + x)^p(1 - x)^q$, the coefficients of x and x^2 are 1 and -2, respectively, then $p^2 + q^2$ is equal to : [JEE Main 2025]
 (A) 8 (B) 20 (C) 13 (D) 18
33. The number of ways, 5 boys and 4 girls can sit in a row so that either all the boys sit together or no two boys sit together, is [JEE Main 2025]
34. If $\sum_{r=1}^{13} \left\{ \frac{1}{\sin\left(\frac{\pi}{4} + (r-1)\frac{\pi}{6}\right) \sin\left(\frac{\pi}{4} + r\frac{\pi}{6}\right)} \right\} = a\sqrt{3} + b$, $a, b \in \mathbb{Z}$, then $a^2 + b^2$ is equal to : [JEE Main 2025]
 (A) 10 (B) 4 (C) 8 (D) 2
35. The number of solutions of the equation $\cos 2\theta \cos \frac{\theta}{2} + \cos \frac{5\theta}{2} = 2 \cos^3 \frac{5\theta}{2}$ in $[-\frac{\pi}{2}, \frac{\pi}{2}]$ is : [JEE Main 2025]
 (A) 5 (B) 7 (C) 6 (D) 9
36. If $7 = 5 + \frac{1}{7}(5 + \alpha) + \frac{1}{7^2}(5 + 2\alpha) + \frac{1}{7^3}(5 + 3\alpha) + \dots \infty$, then the value of α is : [JEE Main 2025]
 (A) $\frac{1}{7}$ (B) 1 (C) $\frac{6}{7}$ (D) 6
37. The lines $L_1, L_2, \dots, L_{20}$ are distinct. For $n = 1, 2, 3, \dots, 10$ all the lines L_{2n-1} are parallel to each other and all the lines L_{2n} pass through a given point P. The maximum number of points of intersection of pairs of lines from the set $\{L_1, L_2, \dots, L_{20}\}$ is equal to [JEE Main 2024]
38. The portion of the line $4x + 5y = 20$ in the first quadrant is trisected by the lines L_1 and L_2 passing through the origin. The tangent of an angle between the lines L_1 and L_2 is : [JEE Main 2024]
 (A) $\frac{30}{41}$ (B) $\frac{8}{5}$ (C) $\frac{2}{5}$ (D) $\frac{25}{41}$
39. Let the centre of a circle, passing through the points $(0, 0)$, $(1, 0)$ and touching the circle $x^2 + y^2 = 9$, be (h, k) . Then for all possible values of the coordinates of the centre (h, k) , $4(h^2 + k^2)$ is equal to [JEE Main 2024]

40. A square is inscribed in the circle $x^2 + y^2 - 10x - 6y + 30 = 0$. One side of this square is parallel to $y = x + 3$. If (x_i, y_i) are the vertices of the square, then $\sum (x_i^2 + y_i^2)$ is equal to: [JEE Main 2024]
 (A) 152 (B) 148 (C) 156 (D) 160

FRIDAY 24TH JULY

41. If the equation $a(b - c)x^2 + b(c - a)x + c(a - b) = 0$ has equal roots, where $a + c = 15$ and $b = \frac{36}{5}$, then $a^2 + c^2$ is equal to [JEE Main 2025]
42. For some $n \neq 10$, let the coefficients of the 5th, 6th and 7th terms in the binomial expansion of $(1 + x)^{n+4}$ be in A.P. Then the largest coefficient in the expansion of $(1 + x)^{n+4}$ is: [JEE Main 2025]
 (A) 10 (B) 35 (C) 70 (D) 20
43. The number of 3-digit numbers, that are divisible by 2 and 3, but not divisible by 4 and 9, is [JEE Main 2025]
44. Let T_r be the r^{th} term of an A.P. If for some m , $T_m = \frac{1}{25}$, $T_{25} = \frac{1}{20}$, and $20 \sum_{r=1}^{25} T_r = 13$, then $5m \sum_{r=m}^{2m} T_r$ is equal to [JEE Main 2025]
 (A) 98 (B) 126 (C) 112 (D) 142
45. A variable line L passes through the point $(3, 5)$ and intersects the positive coordinate axes at the points A and B . The minimum area of the triangle OAB , where O is the origin, is: [JEE Main 2024]
 (A) 35 (B) 25 (C) 30 (D) 40
46. A ray of light coming from the point $P(1, 2)$ gets reflected from the point Q on the x -axis and then passes through the point $R(4, 3)$. If the point $S(h, k)$ is such that $PQRS$ is a parallelogram, then hk^2 is equal to: [JEE Main 2024]
 (A) 60 (B) 70 (C) 80 (D) 90
47. The vertices of a triangle are $A(-1, 3)$, $B(-2, 2)$ and $C(3, -1)$. A new triangle is formed by shifting the sides of the triangle by one unit inwards. Then the equation of the side of the new triangle nearest to origin is: [JEE Main 2024]
 (A) $-x + y - (2 - \sqrt{2}) = 0$ (B) $x + y - (2 - \sqrt{2}) = 0$
 (C) $x + y + (2 - \sqrt{2}) = 0$ (D) $x - y - (2 + \sqrt{2}) = 0$
48. Let C be a circle with radius $\sqrt{10}$ units and centre at the origin. Let the line $x + y = 2$ intersect the circle C at the points P and Q . Let MN be a chord of C of length 2 unit and slope -1 . Then, a distance (in units) between the chord PQ and the chord MN is [JEE Main 2024]
 (A) $3 - \sqrt{2}$ (B) $2 - \sqrt{3}$ (C) $\sqrt{2} - 1$ (D) $\sqrt{2} + 1$
49. If the image of the point $(-4, 5)$ in the line $x + 2y = 2$ lies on the circle $(x + 4)^2 + (y - 3)^2 = r^2$, then r is equal to: [JEE Main 2024]
 (A) 2 (B) 3 (C) 4 (D) 1
50. The number of singular matrices of order 2, whose elements are from the set $\{2, 3, 6, 9\}$, is [JEE Main 2025]

ANSWER KEY

1. (D)	2. 465	3. 64	4. (C)	5. 20	6. (D)	7. (C)	8. 32
9. (C)	10. 2	11. (A)	12. (C)	13. (D)	14. (A)	15. (C)	16. 474
17. (A)	18. (A)	19. (C)	20. (D)	21. (C)	22. 612	23. (D)	24. (D)
25. (D)	26. (D)	27. (C)	28. 36	29. (C)	30. (B)	31. (C)	32. (C)
33. 17280	34. (C)	35. (B)	36. (D)	37. 101	38. (A)	39. 9	40. (A)
41. 117	42. (B)	43. 125	44. (B)	45. (C)	46. (B)	47. (B)	48. (A)
49. (A)	50. 36						