

JEE MAIN COMPLEX NUMBERS AND QUADRATIC EQUATIONS — PYQS

Max. Marks: 240

Questions: 60

Section A (MCQ) — 54 questions

Q.1 The number of values of $z \in \mathbb{C}$, satisfying the equations $|z - (4 + 8i)| = \sqrt{10}$ and

$$|z - (3 + 5i)| + |z - (5 + 11i)| = 4\sqrt{5}, \text{ is :}$$

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) 0 (2) 2 (3) 1 (4) 4

Scan or tap for the full solution 

Q.2 Let e_1 and e_2 be two distinct roots of the equation $x^2 - ax + 2 = 0$. Let the sets $\{a \in \mathbb{R} : e_1 \text{ and } e_2 \text{ are the eccentricities of hyperbolas}\} = (\alpha, \beta)$, and $\{a \in \mathbb{R} : e_1 \text{ and } e_2 \text{ are the eccentricities of an ellipse and a hyperbola, respectively}\} = (\gamma, \infty)$. Then $\alpha^2 + \beta^2 + \gamma^2$ is equal to :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) 18 (2) 22 (3) 26 (4) 34

Scan or tap for the full solution 

Q.3 Let the set of all values of $k \in \mathbb{R}$ such that the equation $z(\bar{z} + 2 + i) + k(2 + 3i) = 0$, $z \in \mathbb{C}$, has at least one solution, be the interval $[\alpha, \beta]$. Then $9(\alpha + \beta)$ is equal to :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) -10 (2) -8
(3) $10\sqrt{13}$ (4) $8\sqrt{13}$

Scan or tap for the full solution 

Q.4 Let $S = \{z \in \mathbb{C} : z^2 + \sqrt{6}iz - 3 = 0\}$. Then $\sum_{z \in S} z^8$ is equal to :

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) 162 (2) 184 (3) 262 (4) 324

Scan or tap for the full solution 

Q.5 Let $a, b \in \mathbb{C}$. Let α, β be the roots of the equation $x^2 + ax + b = 0$. If $\beta - \alpha = \sqrt{11}$ and $\beta^2 - \alpha^2 = 3i\sqrt{11}$, then $(\beta^3 - \alpha^3)^2$ is equal to :

[JEE Main 2026 (Online) 5th April Morning Shift]

- (1) 160 (2) 176 (3) 194 (4) 187

Scan or tap for the full solution 

Q.6 Let α, β be the roots of the equation $x^2 - x + p = 0$ and γ, δ be the roots of 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 :

[JEE Main 2026 (Online) 5th April Evening Shift]

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

Scan or tap for the full solution 

Q.7 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 :

[JEE Main 2026 (Online) 5th April Evening Shift]

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

Scan or tap for the full solution 

Q.8 If the set of all solutions of $|x^2 + x - 9| = |x| + |x^2 - 9|$ is $[\alpha, \beta] \cup [\gamma, \infty)$, then $(\alpha^2 + \beta^2 + \gamma^2)$ is equal to :

[JEE Main 2026 (Online) 4th April Morning Shift]

- (1) 9 (2) 18 (3) 36 (4) 72

Scan or tap for the full solution 

Q.9 Let z be a complex number such that $|z + 2| = |z - 2|$ and $\arg\left(\frac{z+3}{z-i}\right) = \frac{\pi}{4}$. Then $|z|^2$ is equal to :

[JEE Main 2026 (Online) 4th April Morning Shift]

- (1) 9 (2) 4 (3) 5 (4) 1

Scan or tap for the full solution 

Q.10 Let $S = \{z \in \mathbb{C} : z^2 + 4z + 16 = 0\}$. Then

$$\sum_{z \in S} |z + \sqrt{3}i|^2 \text{ is equal to :}$$

[JEE Main 2026 (Online) 4th April Evening Shift]

- (1) 42 (2) 23 (3) 27 (4) 38

Scan or tap for the full solution 

Q.11 If the quadratic equation $(\lambda + 2)x^2 - 3\lambda x + 4\lambda = 0$, $\lambda \neq -2$, has two positive roots, then the number of possible integral values of λ is :

[JEE Main 2026 (Online) 4th April Evening Shift]

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

Scan or tap for the full solution 

Q.12 Let $\alpha, \alpha+2, \alpha \in \mathbb{Z}$, be the roots of the quadratic equation $x(x+2) + (x+1)(x+3) + (x+2)(x+4) + \dots + (x+n-1)(x+n+1) = 4n$ for some $n \in \mathbb{N}$. Then $n + \alpha$ is equal to :

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 0 (2) 1 (3) 2 (4) 3

Scan or tap for the full solution



Q.13 Let x and y be real numbers such that $50\left(\frac{2x}{1+3i} - \frac{y}{1-2i}\right) = 31 + 17i$, $i = \sqrt{-1}$. Then the value of $10(x-3y)$ is :

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 20 (2) 31 (3) 35 (4) 75

Scan or tap for the full solution



Q.14 Let α, β be the roots of the equation $x^2 - 3x + r = 0$, and $\frac{\alpha}{2}, 2\beta$ be the roots of the equation $x^2 + 3x + r = 0$.

If the roots of the equation $x^2 + 6x = m$ are $2\alpha + \beta + 2r$ and $\alpha - 2\beta - \frac{r}{2}$, then m is equal to :

[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) -135 (2) -567 (3) 135 (4) 567

Scan or tap for the full solution



Q.15 Let the circles $C_1: |z| = r$ and $C_2: |z-3-4i| = 5$, $z \in \mathbb{C}$, be such that C_2 lies within C_1 .

If z_1 moves on C_1 , z_2 moves on C_2 and $\min|z_1 - z_2| = 2$, then $\max|z_1 - z_2|$ is equal to :

[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) 12 (2) 17 (3) 22 (4) 24

Scan or tap for the full solution



Q.16 If α, β , where $\alpha < \beta$, are the roots of the equation $\lambda x^2 - (\lambda + 3)x + 3 = 0$ such that $\frac{1}{\alpha} - \frac{1}{\beta} = \frac{1}{3}$, then the sum of all possible values of λ is

[JEE Main 2026 (Online) 28th January Morning Shift]

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

Scan or tap for the full solution



Q.17 Let $S = \{x^3 + ax^2 + bx + c : a, b, c \in \mathbb{N} \text{ and } a, b, c \leq 20\}$ be a set of polynomials. Then the number of polynomials in S , which are divisible by $x^2 + 2$, is

[JEE Main 2026 (Online) 28th January Morning Shift]

- (1) 6 (2) 120 (3) 20 (4) 10

Scan or tap for the full solution



Q.18 Let z be a complex number such that $|z - 6| = 5$ and $|z + 2 - 6i| = 5$. Then the value of $z^3 + 3z^2 - 15z + 141$ is equal to :

[JEE Main 2026 (Online) 28th January Morning Shift]

- (1) 61 (2) 37 (3) 42 (4) 50

Scan or tap for the full solution



Q.19 Let the arithmetic mean of $\frac{1}{a}$ and $\frac{1}{b}$ be $\frac{5}{16}$, $a > 2$. If α is such that $a, 4, \alpha, b$ are in A.P., then the equation $\alpha x^2 - ax + 2(\alpha - 2b) = 0$ has :

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) one root in $(1, 4)$ and another in $(-2, 0)$
 (2) one root in $(0, 2)$ and another in $(-4, -2)$
 (3) both roots in the interval $(-2, 0)$
 (4) complex roots of magnitude less than 2

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Q.20 Let $A = \{z \in \mathbb{C} : |z - 2| \leq 4\}$ and $B = \{z \in \mathbb{C} : |z - 2| + |z + 2| = 5\}$. Then the max $\{|z_1 - z_2| : z_1 \in A \text{ and } z_2 \in B\}$ is :

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) $\frac{17}{2}$ (2) 8 (3) 9 (4) $\frac{15}{2}$

Scan or tap for the full solution



Q.21 The number of the real solutions of the equation: $x|x+3| + |x-1| - 2 = 0$ is

[JEE Main 2026 (Online) 24th January Morning Shift]

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

Scan or tap for the full solution



Q.22 Let $S = \left\{ z \in \mathbb{C} : \left| \frac{z-6i}{z-2i} \right| = 1 \text{ and } \left| \frac{z-8+2i}{z+2i} \right| = \frac{3}{5} \right\}$. Then $\sum_{z \in S} |z|^2$ is equal to :

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 413 (2) 398 (3) 385 (4) 423

Scan or tap for the full solution



Q.23 The smallest positive integral value of a , for which all the roots of $x^4 - ax^2 + 9 = 0$ are real and distinct, is equal to

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) 7 (2) 3 (3) 4 (4) 9

Scan or tap for the full solution



- Q.24** If α and β ($\alpha < \beta$) are the roots of the equation $(-2 + \sqrt{3})(\sqrt{x} - 3) + (x - 6\sqrt{x}) + (9 - 2\sqrt{3}) = 0$, $x \geq 0$, then $\sqrt{\frac{\beta}{\alpha}} + \sqrt{\alpha\beta}$ is equal to :
- [JEE Main 2026 (Online) 23rd January Morning Shift]
- (1) 8 (2) 10 (3) 9 (4) 11

Scan or tap for the full solution



- Q.25** Let $S = \{z : 3 \leq |2z - 3(1+i)| \leq 7\}$ be a set of complex numbers. Then $\min_{z \in S} \left| \left(z + \frac{1}{2}(5+3i) \right) \right|$ is equal to :
- [JEE Main 2026 (Online) 23rd January Morning Shift]
- (1) $\frac{1}{2}$ (2) $\frac{5}{2}$ (3) 2 (4) $\frac{3}{2}$

Scan or tap for the full solution



- Q.26** A building construction work can be completed by two masons A and B together in 22.5 days. Mason A alone can complete the construction work in 24 days less than mason B alone. Then mason A alone will complete the construction work in :
- [JEE Main 2026 (Online) 23rd January Morning Shift]
- (1) 36 days (2) 24 days (3) 30 days (4) 42 days

Scan or tap for the full solution



- Q.27** If $z = \frac{\sqrt{3}}{2} + \frac{i}{2}$, $i = \sqrt{-1}$, then $(z^{201} - i)^8$ is equal to
- [JEE Main 2026 (Online) 23rd January Evening Shift]
- (1) 1 (2) 0 (3) -1 (4) 256

Scan or tap for the full solution



- Q.28** The number of distinct real solutions of the equation $x|x+4| + 3|x+2| + 10 = 0$ is
- [JEE Main 2026 (Online) 22nd January Morning Shift]
- (1) 2 (2) 3 (3) 0 (4) 1

Scan or tap for the full solution



- Q.29** Let α, β be the roots of the quadratic equation $12x^2 - 20x + 3\lambda = 0$, $\lambda \in \mathbb{Z}$. If $\frac{1}{2} \leq |\beta - \alpha| \leq \frac{3}{2}$, then the sum of all possible values of λ is :
- [JEE Main 2026 (Online) 22nd January Evening Shift]
- (1) 3 (2) 6 (3) 1 (4) 4

Scan or tap for the full solution



- Q.30** Let $S = \{z \in \mathbb{C} : 4z^2 + \bar{z} = 0\}$. Then $\sum_{z \in S} |z|^2$ is equal to:
- [JEE Main 2026 (Online) 22nd January Evening Shift]
- (1) $\frac{5}{64}$ (2) $\frac{1}{16}$ (3) $\frac{7}{64}$ (4) $\frac{3}{16}$

Scan or tap for the full solution



- Q.31** If $x^2 + x + 1 = 0$, then the value of $\left(x + \frac{1}{x}\right)^4 + \left(x^2 + \frac{1}{x^2}\right)^4 + \left(x^3 + \frac{1}{x^3}\right)^4 + \dots + \left(x^{25} + \frac{1}{x^{25}}\right)^4$ is:
- [JEE Main 2026 (Online) 21st January Morning Shift]
- (1) 162 (2) 145 (3) 128 (4) 175

Scan or tap for the full solution



- Q.32** The sum of all the roots of the equation $(x-1)^2 - 5|x-1| + 6 = 0$, is :
- [JEE Main 2026 (Online) 21st January Morning Shift]
- (1) 3 (2) 1 (3) 4 (4) 5

Scan or tap for the full solution



- Q.33** Let α and β be the roots of the equation $x^2 + 2ax + (3a+10) = 0$ such that $\alpha < 1 < \beta$. Then the set of all possible values of a is :
- [JEE Main 2026 (Online) 21st January Evening Shift]
- (1) $\left(-\infty, -\frac{11}{5}\right) \cup (5, \infty)$
 (2) $\left(-\infty, -\frac{11}{5}\right)$
 (3) $(-\infty, -3)$
 (4) $(-\infty, -2) \cup (5, \infty)$

Scan or tap for the full solution



- Q.34** Let z be the complex number satisfying $|z - 5| \leq 3$ and having maximum positive principal argument. Then $34 \left| \frac{5z-12}{5iz+16} \right|^2$ is equal to:
- [JEE Main 2026 (Online) 21st January Evening Shift]
- (1) 20 (2) 26 (3) 12 (4) 16

Scan or tap for the full solution



- Q.35** Let α be a solution of $x^2 + x + 1 = 0$, and for some a and b in $\mathbb{R}$,
- $$\begin{bmatrix} 1 & 16 & 13 \\ 4 & a & b \end{bmatrix} \begin{bmatrix} 1 & -1 & 2 \\ -2 & -14 & -8 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \end{bmatrix}.$$
- If $\frac{4}{\alpha^4} + \frac{m}{\alpha^a} + \frac{n}{\alpha^b} = 3$, then $m+n$ is equal to _____
- [JEE Main 2025 (Online) 8th April Evening Shift]
- (1) 11 (2) 3 (3) 8 (4) 7

Scan or tap for the full solution



- Q.36** The sum of the squares of the roots of $|x-2|^2 + |x-2| - 2 = 0$ and the squares of the roots of $x^2 - 2|x-3| - 5 = 0$, is

[JEE Main 2025 (Online) 8th April Evening Shift]

- (1) 24 (2) 26 (3) 36 (4) 30

Scan or tap for the full solution



- Q.37** Let

$$A = \left\{ \theta \in [0, 2\pi] : 1 + 10 \operatorname{Re} \left(\frac{2\cos\theta + i\sin\theta}{\cos\theta - 3i\sin\theta} \right) = 0 \right\}.$$

Then $\sum_{\theta \in A} \theta^2$ is equal to

[JEE Main 2025 (Online) 8th April Evening Shift]

- (1) $\frac{21}{4}\pi^2$ (2) $6\pi^2$ (3) $\frac{27}{4}\pi^2$ (4) $8\pi^2$

Scan or tap for the full solution



- Q.38** Let the set of all values of $p \in \mathbb{R}$, for which both the roots of the equation $x^2 - (p+2)x + (2p+9) = 0$ are negative real numbers, be the interval $(\alpha, \beta]$. Then $\beta - 2\alpha$ is equal to

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) 5 (2) 0 (3) 20 (4) 9

Scan or tap for the full solution



- Q.39** Among the statements

(S1) : The set

$$\left\{ z \in \mathbb{C} - \{-i\} : |z| = 1 \text{ and } \frac{z-i}{z+i} \text{ is purely real} \right\}$$

contains exactly two elements, and

(S2) : The set

$$\left\{ z \in \mathbb{C} - \{-1\} : |z| = 1 \text{ and } \frac{z-1}{z+1} \text{ is purely imaginary} \right\}$$

contains infinitely many elements.

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) both are incorrect (2) both are correct
(3) only (S2) is correct (4) only (S1) is correct

Scan or tap for the full solution



- Q.40** If the locus of $z \in \mathbb{C}$, such that

$$\operatorname{Re} \left(\frac{z-1}{2z+i} \right) + \operatorname{Re} \left(\frac{\bar{z}-1}{2\bar{z}-i} \right) = 2, \text{ is a circle of radius } r$$

and center (a, b) , then $\frac{15ab}{r^2}$ is equal to :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) 16 (2) 24 (3) 12 (4) 18

Scan or tap for the full solution



- Q.41** The number of real roots of the equation $x|x-2| + 3|x-3| + 1 = 0$ is :

[JEE Main 2025 (Online) 7th April Evening Shift]

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

Scan or tap for the full solution



- Q.42** Consider the equation $x^2 + 4x - n = 0$, where $n \in [20, 100]$ is a natural number. Then the number of all distinct values of n , for which the given equation has integral roots, is equal to

[JEE Main 2025 (Online) 4th April Morning Shift]

- (1) 6 (2) 5 (3) 8 (4) 7

Scan or tap for the full solution



- Q.43** Let the product of $\omega_1 = (8+i)\sin\theta + (7+4i)\cos\theta$ and $\omega_2 = (1+8i)\sin\theta + (4+7i)\cos\theta$ be $\alpha + i\beta$, $i = \sqrt{-1}$. Let p and q be the maximum and the minimum values of $\alpha + \beta$ respectively. Then $p + q$ is equal to :

[JEE Main 2025 (Online) 4th April Evening Shift]

- (1) 130 (2) 150 (3) 160 (4) 140

Scan or tap for the full solution



- Q.44** Let α and β be the roots of $x^2 + \sqrt{3}x - 16 = 0$, and γ and δ be the roots of $x^2 + 3x - 1 = 0$. If $P_n = \alpha^n + \beta^n$ and $Q_n = \gamma^n + \delta^n$, then $\frac{P_{25} + \sqrt{3}P_{24}}{2P_{23}} + \frac{Q_{25} - Q_{23}}{Q_{24}}$ is equal to [JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 4 (2) 3 (3) 5 (4) 7

Scan or tap for the full solution



- Q.45** Let $z \in \mathbb{C}$ be such that $\frac{z^2 + 3i}{z - 2 + i} = 2 + 3i$. Then the sum of all possible values of z^2 is :

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) $-19 + 2i$ (2) $-19 - 2i$ (3) $19 - 2i$ (4) $19 + 2i$

Scan or tap for the full solution



- Q.46** If $z_1, z_2, z_3 \in \mathbb{C}$ are the vertices of an equilateral triangle whose centroid is z_0 , then $\sum_{k=1}^3 (z_k - z_0)^2$ is equal to [JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 0 (2) 1 (3) i (4) $-i$

Scan or tap for the full solution



- Q.47** Let the equation $x(x+2)(12-k) = 2$ have equal roots. Then the distance of the point $\left(k, \frac{k}{2}\right)$ from the line $3x + 4y + 5 = 0$ is

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 15 (2) 12 (3) $5\sqrt{3}$ (4) $15\sqrt{5}$

Scan or tap for the full solution



Q.48 Let z be a complex number such that $|z| = 1$. If $\frac{2+k^2z}{k+\bar{z}} = kz$, $k \in \mathbb{R}$, then the maximum distance of $k + ik^2$ from the circle $|z - (1 + 2i)| = 1$ is :

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) $\sqrt{5} + 1$ (2) 3
(3) $\sqrt{3} + 1$ (4) 2

Scan or tap for the full solution



Q.49 Let $P_n = \alpha^n + \beta^n$, $n \in \mathbb{N}$. If $P_{10} = 123$, $P_9 = 76$, $P_8 = 47$ and $P_1 = 1$, then the quadratic equation having roots $\frac{1}{\alpha}$ and $\frac{1}{\beta}$ is :

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) $x^2 + x - 1 = 0$ (2) $x^2 - x + 1 = 0$
(3) $x^2 + x + 1 = 0$ (4) $x^2 - x - 1 = 0$

Scan or tap for the full solution



Q.50 The number of solutions of the equation

$$\left(\frac{9}{x} - \frac{9}{\sqrt{x}} + 2\right)\left(\frac{2}{x} - \frac{7}{\sqrt{x}} + 3\right) = 0 \text{ is :}$$

[JEE Main 2025 (Online) 29th January Morning Shift]

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

Scan or tap for the full solution



Q.51 Let $|z_1 - 8 - 2i| \leq 1$ and $|z_2 - 2 + 6i| \leq 2$, $z_1, z_2 \in \mathbb{C}$. Then the minimum value of $|z_1 - z_2|$ is :

[JEE Main 2025 (Online) 29th January Morning Shift]

- (1) 3 (2) 10 (3) 7 (4) 13

Scan or tap for the full solution



Q.52 The sum, of the squares of all the roots of the equation $x^2 + |2x - 3| - 4 = 0$, is

[JEE Main 2025 (Online) 28th January Morning Shift]

- (1) $6(2 - \sqrt{2})$ (2) $3(3 - \sqrt{2})$
(3) $3(2 - \sqrt{2})$ (4) $6(3 - \sqrt{2})$

Scan or tap for the full solution



Q.53 Let O be the origin, the point A be $z_1 = \sqrt{3} + 2\sqrt{2}i$, the point $B(z_2)$ be such that $\sqrt{3}|z_2| = |z_1|$ and $\arg(z_2) = \arg(z_1) + \frac{\pi}{6}$. Then

[JEE Main 2025 (Online) 28th January Morning Shift]

(1) area of triangle ABO is $\frac{11}{4}$

(2) area of triangle ABO is $\frac{11}{\sqrt{3}}$

(3) ABO is a scalene triangle

(4) ABO is an obtuse angled isosceles triangle

Scan or tap for the full solution



Q.54 If $\alpha + i\beta$ and $\gamma + i\delta$ are the roots of $x^2 - (3 - 2i)x - (2i - 2) = 0$, $i = \sqrt{-1}$, then $\alpha\gamma + \beta\delta$ is equal to:

[JEE Main 2025 (Online) 28th January Evening Shift]

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

Scan or tap for the full solution



Section B (Numerical) — 6 questions

Q.55 Let $z = (1 + i)(1 + 2i)(1 + 3i)\dots(1 + ni)$, where $i = \sqrt{-1}$. If $|z|^2 = 44200$, then n is equal to _____.

[JEE Main 2026 (Online) 24th January Evening Shift]

Scan or tap for the full solution



Q.56 Let $\alpha = \frac{-1 + i\sqrt{3}}{2}$ and $\beta = \frac{-1 - i\sqrt{3}}{2}$, $i = \sqrt{-1}$. If $(7 - 7\alpha + 9\beta)^{20} + (9 + 7\alpha - 7\beta)^{20} + (-7 + 9\alpha + 7\beta)^{20} + (14 + 7\alpha + 7\beta)^{20} = m^{10}$, then m is _____

[JEE Main 2026 (Online) 22nd January Morning Shift]

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Q.57 For $t > -1$, let α_t and β_t be the roots of the equation $((t+2)^{1/7} - 1)x^2 + ((t+2)^{1/6} - 1)x + ((t+2)^{1/21} - 1) = 0$. If $\lim_{t \rightarrow -1^+} \alpha_t = a$ and $\lim_{t \rightarrow -1^+} \beta_t = b$, then $72(a + b)^2$ is equal to _____.

[JEE Main 2025 (Online) 7th April Evening Shift]

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Q.58 Let $A = \{z \in \mathbb{C} : |z - 2 - i| = 3\}$, $B = \{z \in \mathbb{C} : \operatorname{Re}(z - iz) = 2\}$ and $S = A \cap B$. Then $\sum_{z \in S} |z|^2$ is equal to _____.

[JEE Main 2025 (Online) 4th April Morning Shift]

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Q.59 If α is a root of the equation $x^2 + x + 1 = 0$ and

$$\sum_{k=1}^n \left(\alpha^k + \frac{1}{\alpha^k} \right)^2 = 20, \text{ then } n \text{ is equal to } \underline{\hspace{2cm}}.$$

[JEE Main 2025 (Online) 4th April Evening Shift]

Scan or tap for the
full solution



Q.60 If the set of all $a \in \mathbb{R} - \{1\}$, for which the roots of the equation $(1 - a)x^2 + 2(a - 3)x + 9 = 0$ are positive is $(-\infty, -\alpha] \cup [\beta, \gamma)$, then $2\alpha + \beta + \gamma$ is equal to _____.

[JEE Main 2025 (Online) 2nd April Evening Shift]

Scan or tap for the
full solution



ANSWER KEY

Section A (MCQ) — 54 questions

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	3	1	1	2	3	4	2	1	4	2
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	3	4	4	3	2	4	4	1	1	1	3
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	1	2	4	1	4	4	1	4	2	3	2
Ques.	34	35	36	37	38	39	40	41	42	43	44
Ans.	1	1	3	1	1	3	4	4	1	1	3
Ques.	45	46	47	48	49	50	51	52	53	54	
Ans.	2	1	1	1	1	4	3	1	4	1	

Section B (Numerical) — 6 questions

Ques.	55	56	57	58	59	60					
Ans.	5	49	98	22	11	7					