

JEE MAIN COMPLEX NUMBERS AND QUADRATIC EQUATIONS — COMPLEX NUMBERS AND ALGEBRA OF COMPLEX NUMBERS — PYQS

Max. Marks: 24

Questions: 6

Section A (MCQ) — 6 questions

Q.1 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.2 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.3 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

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Q.4 If the set $R = \{(a, b) : a + 5b = 42, a, b \in \mathbb{N}\}$ has m elements and $\sum_{n=1}^m (1 - i^{n!}) = x + iy$, where $i = \sqrt{-1}$, then the value of $m + x + y$ is

[JEE Main 2024 (Online) 8th April Morning Shift]

- (1) 12 (2) 4 (3) 8 (4) 5

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Q.5 The sum of all possible values of $\theta \in [-\pi, 2\pi]$, for which $\frac{1 + i\cos\theta}{1 - 2i\cos\theta}$ is purely imaginary, is equal to :

[JEE Main 2024 (Online) 8th April Evening Shift]

- (1) 4π (2) 3π (3) 2π (4) 5π

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Q.6 Let z_1 and z_2 be two complex numbers such that $z_1 + z_2 = 5$ and $z_1^3 + z_2^3 = 20 + 15i$. Then, $|z_1^4 + z_2^4|$ equals -

[JEE Main 2024 (Online) 31st January Evening Shift]

- (1) $15\sqrt{15}$ (2) $30\sqrt{3}$
(3) $25\sqrt{3}$ (4) 75

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full solution



ANSWER KEY

Ques.	1	2	3	4	5	6					
Ans.	4	1	1	1	2	4					