

JEE MAIN COMPLEX NUMBERS AND QUADRATIC EQUATIONS — ARGAND PLANE AND POLAR REPRESENTATION — PYQS

Max. Marks: 16

Questions: 4

Section A (MCQ) — 3 questions

Q.1 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.2 Let z_1, z_2 and z_3 be three complex numbers on the circle $|z| = 1$ with $\arg(z_1) = -\frac{\pi}{4}, \arg(z_2) = 0$ and $\arg(z_3) = \frac{\pi}{4}$. If

$|z_1 \bar{z}_2 + z_2 \bar{z}_3 + z_3 \bar{z}_1|^2 = \alpha + \beta\sqrt{2}, \alpha, \beta \in \mathbb{Z}$, then the value of $\alpha^2 + \beta^2$ is :

[JEE Main 2025 (Online) 22nd January Morning Shift]

- (1) 41 (2) 29 (3) 24 (4) 31

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Q.3 Let r and θ respectively be the modulus and amplitude of the complex number

$z = 2 - i\left(2\tan\frac{5\pi}{8}\right)$, then (r, θ) is equal to

[JEE Main 2024 (Online) 29th January Evening Shift]

- (1) $\left(2\sec\frac{11\pi}{8}, \frac{11\pi}{8}\right)$ (2) $\left(2\sec\frac{3\pi}{8}, \frac{3\pi}{8}\right)$
(3) $\left(2\sec\frac{5\pi}{8}, \frac{3\pi}{8}\right)$ (4) $\left(2\sec\frac{3\pi}{8}, \frac{5\pi}{8}\right)$

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Section B (Numerical) — 1 question

Q.4 If α denotes the number of solutions of $|1 - i|^x = 2^x$ and $\beta = \left(\frac{|z|}{\arg(z)}\right)$, where

$z = \frac{\pi}{4}(1+i)^4 \left[\frac{1-\sqrt{\pi}i}{\sqrt{\pi}+i} + \frac{\sqrt{\pi}-i}{1+\sqrt{\pi}i} \right], i = \sqrt{-1}$, then

the distance of the point (α, β) from the line $4x - 3y = 7$ is _____.

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

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ANSWER KEY

Section A (MCQ) — 3 questions

Ques.	1	2	3								
Ans.	1	2	2								

Section B (Numerical) — 1 question

Ques.	4										
Ans.	3										