

JEE MAIN VECTOR ALGEBRA — ADDITION OF VECTORS, MULTIPLICATION BY A SCALAR — PYQS

Max. Marks: 12

Questions: 3

Section A (MCQ) — 2 questions

- Q.1** Let A, B, C be three points in xy-plane, whose position vectors are given by $\sqrt{3}\hat{i} + \hat{j}$, $\hat{i} + \sqrt{3}\hat{j}$ and $a\hat{i} + (1-a)\hat{j}$ respectively with respect to the origin O. If the distance of the point C from the line bisecting the angle between the vectors $\vec{OA}$ and $\vec{OB}$ is $\frac{9}{\sqrt{2}}$, then the sum of all the possible values of a is:

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

- (1) 2 (2) 0 (3) $\frac{9}{2}$ (4) 1

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full solution

- Q.2** Let the arc AC of a circle subtend a right angle at the centre O. If the point B on the arc AC, divides the arc AC such that $\frac{\text{length of arc AB}}{\text{length of arc BC}} = \frac{1}{5}$, and $\vec{OC} = \alpha\vec{OA} + \beta\vec{OB}$, then $\alpha + \sqrt{2}(\sqrt{3}-1)\beta$ is equal to

[JEE Main 2025 (Online) 23rd January Morning Shift]

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

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Section B (Numerical) — 1 question

- Q.3** Let PQR be a triangle such that $\vec{PQ} = -2\hat{i} - \hat{j} + 2\hat{k}$ and $\vec{PR} = a\hat{i} + b\hat{j} - 4\hat{k}$, $a, b \in \mathbb{Z}$. Let S be the point on QR, which is equidistant from the lines PQ and PR. If $|\vec{PR}| = 9$ and $\vec{PS}$ is parallel to $\hat{i} - 7\hat{j} + 2\hat{k}$, then the value of $3a - 4b$ is _____.

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

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ANSWER KEY

Section A (MCQ) — 2 questions

Ques.	1	2									
Ans.	4	4									

Section B (Numerical) — 1 question

Ques.	3										
Ans.	37										