

JEE MAIN STRAIGHT LINES — ANGLE BISECTORS AND REFLECTION OF A POINT (JEE) — PYQS

Max. Marks: 32

Questions: 8

Section A (MCQ) — 5 questions

- Q.1** Let the line $L_1: x + 3 = 0$ intersect the lines $L_2: x - y = 0$ and $L_3: 3x + y = 0$ at the points A and B, respectively. Let the bisector of the obtuse angle between the lines L_2 and L_3 intersect the line L_1 at the point C. Then $BC^2:AC^2$ is equal to:

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

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

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- Q.2** Let $A(1, 0)$, $B(2, -1)$ and $C\left(\frac{7}{3}, \frac{4}{3}\right)$ be three points. If the equation of the bisector of the angle ABC is $\alpha x + \beta y = 5$, then the value of $\alpha^2 + \beta^2$ is

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

- (1) 5 (2) 10 (3) 8 (4) 13

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- Q.3** Let $\triangle ABC$ be a triangle formed by the lines $7x - 6y + 3 = 0$, $x + 2y - 31 = 0$ and $9x - 2y - 19 = 0$. Let the point (h, k) be the image of the centroid of $\triangle ABC$ in the line $3x + 6y - 53 = 0$. Then $h^2 + k^2 + hk$ is equal to :

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

- (1) 47 (2) 37 (3) 40 (4) 36

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- Q.4** Let the lines $3x - 4y - \alpha = 0$, $8x - 11y - 33 = 0$, and $2x - 3y + \lambda = 0$ be concurrent. If the image of the point $(1, 2)$ in the line $2x - 3y + \lambda = 0$ is $\left(\frac{57}{13}, \frac{-40}{13}\right)$, then $|\alpha\lambda|$ is equal to

[JEE Main 2025 (Online) 24th January Morning Shift]

- (1) 91 (2) 113 (3) 101 (4) 84

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- Q.5** Let the triangle PQR be the image of the triangle with vertices $(1, 3)$, $(3, 1)$ and $(2, 4)$ in the line $x + 2y = 2$. If the centroid of $\triangle PQR$ is the point (α, β) , then $15(\alpha - \beta)$ is equal to :

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

- (1) 21 (2) 19 (3) 22 (4) 24

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Section B (Numerical) — 3 questions

- Q.6** From the point $(-1, -1)$, two rays are sent making angles of 45° with the line $x + y = 0$. These rays get reflected from the mirror $x + 2y = 1$. If the equations of the reflected rays are $ax + by = 9$ and $cx + dy = 7$, $a, b, c, d \in \mathbb{Z}$, then the value of $ad + bc$ is _____.

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

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- Q.7** Let A, B be points on the two half-lines $x - \sqrt{3}|y| = \alpha$, $\alpha > 0$ at a distance of α from their point of intersection P. The line segment AB meets the angle bisector of the given half-lines at the point Q. If $PQ = \frac{9}{2}$ and R is the radius of the circumcircle of $\triangle PAB$, then $\frac{\alpha^2}{R}$ is equal to _____.

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

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- Q.8** If P is a point on the circle $x^2 + y^2 = 4$, Q is a point on the straight line $5x + y + 2 = 0$ and $x - y + 1 = 0$ is the perpendicular bisector of PQ, then 13 times the sum of abscissa of all such points P is _____.

[JEE Main 2026 (Online) 21st January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 5 questions

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

Section B (Numerical) — 3 questions

Ques.	6	7	8								
Ans.	7	9	2								