

JEE MAIN STRAIGHT LINES — PYQS

Max. Marks: 104

Questions: 26

Section A (MCQ) — 22 questions

Q.1 If a straight line drawn through the point of intersection of the lines $4x + 3y - 1 = 0$ and $3x + 4y - 1 = 0$, meets the co-ordinate axes at the points P and Q, then the locus of the mid point of PQ is : [JEE Main 2026 (Online) 8th April Evening Shift]

- (1) $x + y - 7 = 0$ (2) $x + y - 14xy = 0$
 (3) $2x + y + 14xy = 0$ (4) $x + 2y - 14xy = 0$

Scan or tap for the
full solution



Q.2 In an equilateral triangle PQR, let the vertex P be at (3, 5) and the side QR be along the line $x + y = 4$. If the orthocentre of the triangle PQR is (α, β) , then $9(\alpha + \beta)$ is equal to:

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

- (1) 16 (2) 27 (3) 36 (4) 48

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full solution



Q.3 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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full solution



Q.4 Let the vertex A of a triangle ABC be (1, 2), and the mid-point of the side AB be (5, -1). If the centroid of this triangle is (3, 4) and its circumcenter is (α, β) , then $21(\alpha + \beta)$ is equal to :

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

- (1) 309 (2) 403 (3) 497 (4) 524

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full solution



Q.5 Let the mid points of the sides of a triangle ABC be $(\frac{5}{2}, 7)$, $(\frac{5}{2}, 3)$ and (4, 5). If its incentre is (h, k), then $3h + k$ is equal to :

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

- (1) 11 (2) 12 (3) 13 (4) 14

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full solution



Q.6 Let ABC be an equilateral triangle with orthocenter at the origin and the side BC on the line $x + 2\sqrt{2}y = 4$. If the co-ordinates of the vertex A are (α, β) , then the greatest integer less than or equal to $|\alpha + \sqrt{2}\beta|$ is

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

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

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full solution



Q.7 Let A(1, 0), B(2, -1) and $C(\frac{7}{3}, \frac{4}{3})$ 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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full solution



Q.8 Let the angles made with the positive x-axis by two straight lines drawn from the point P(2, 3) and meeting the line $x + y = 6$ at a distance $\sqrt{\frac{2}{3}}$ from the point P be θ_1 and θ_2 . Then the value of $(\theta_1 + \theta_2)$ is:

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

- (1) $\frac{\pi}{2}$ (2) $\frac{\pi}{3}$ (3) $\frac{\pi}{12}$ (4) $\frac{\pi}{6}$

Scan or tap for the
full solution



Q.9 A rectangle is formed by the lines $x = 0$, $y = 0$, $x = 3$ and $y = 4$. Let the line L be perpendicular to $3x + y + 6 = 0$ and divide the area of the rectangle into two equal parts. Then the distance of the point $(\frac{1}{2}, -5)$ from the line L is equal to :

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) $\sqrt{10}$ (2) $2\sqrt{5}$ (3) $2\sqrt{10}$ (4) $3\sqrt{10}$

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full solution



Q.10 Let A(1, 2) and C(-3, -6) be two diagonally opposite vertices of a rhombus, whose sides AD and BC are parallel to the line $7x - y = 14$. If B(α , β) and D(γ , δ) are the other two vertices, then $|\alpha + \beta + \gamma + \delta|$ is equal to :

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) 3 (2) 6 (3) 1 (4) 9

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Q.11 Among the statements

(S1) : If $A(5, -1)$ and $B(-2, 3)$ are two vertices of a triangle, whose orthocentre is $(0, 0)$, then its third vertex is $(-4, -7)$

and

(S2) : If positive numbers $2a, b, c$ are three consecutive terms of an A.P., then the lines $ax + by + c = 0$ are concurrent at $(2, -2)$,

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

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

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Q.12 Let a point A lie between the parallel lines L_1 and L_2 such that its distances from L_1 and L_2 are 6 and 3 units, respectively. Then the area (in sq. units) of the equilateral triangle ABC, where the points B and C lie on the lines L_1 and L_2 , respectively, is :

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

- (1) $21\sqrt{3}$ (2) $12\sqrt{2}$ (3) $15\sqrt{6}$ (4) 27

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Q.13 Let a be the length of a side of a square OABC with O being the origin. Its side OA makes an acute angle α with the positive x-axis and the equations of its diagonals are $(\sqrt{3} + 1)x + (\sqrt{3} - 1)y = 0$ and $(\sqrt{3} - 1)x - (\sqrt{3} + 1)y + 8\sqrt{3} = 0$. Then a^2 is equal to :

- (1) 48 (2) 16 (3) 24 (4) 32

Scan or tap for the full solution



Q.14 A line passing through the point $P(a, 0)$ makes an acute angle α with the positive x-axis. Let this line be rotated about the point P through an angle $\frac{\alpha}{2}$ in the clockwise direction. If in the new position, the slope of the line is $2 - \sqrt{3}$ and its distance from the origin is $\frac{1}{\sqrt{2}}$, then the value of $3a^2 \tan^2 \alpha - 2\sqrt{3}$ is :

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

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

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Q.15 Let ABC be the triangle such that the equations of lines AB and AC be $3y - x = 2$ and $x + y = 2$, respectively, and the points B and C lie on x-axis. If P is the orthocentre of the triangle ABC, then the area of the triangle PBC is equal to

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

- (1) 8 (2) 4 (3) 10 (4) 6

Scan or tap for the full solution



Q.16 If the orthocenter of the triangle formed by the lines $y = x + 1$, $y = 4x - 8$ and $y = mx + c$ is at $(3, -1)$, then $m - c$ is :

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

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

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Q.17 Let the three sides of a triangle lie on the lines $4x - 7y + 10 = 0$, $x + y = 5$ and $7x + 4y = 15$. Then the distance of its orthocentre from the orthocentre of the triangle formed by the lines $x = 0$, $y = 0$ and $x + y = 1$ is

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

- (1) $\sqrt{20}$ (2) 20 (3) $\sqrt{5}$ (4) 5

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Q.18 A line passes through the origin and makes equal angles with the positive coordinate axes. It intersects the lines $L_1: 2x + y + 6 = 0$ and $L_2: 4x + 2y - p = 0$, $p > 0$, at the points A and B, respectively. If $AB = \frac{9}{\sqrt{2}}$ and the foot of the perpendicular from the point A on the line L_2 is M, then $\frac{AM}{BM}$ is equal to

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

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

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Q.19 Consider the lines $x(3\lambda + 1) + y(7\lambda + 2) = 17\lambda + 5$, λ being a parameter, all passing through a point P. One of these lines (say L) is farthest from the origin. If the distance of L from the point $(3, 6)$ is d, then the value of d^2 is

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

- (1) 10 (2) 20 (3) 15 (4) 30

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- Q.20** Let the area of the triangle formed by a straight line $L: x + by + c = 0$ with co-ordinate axes be 48 square units. If the perpendicular drawn from the origin to the line L makes an angle of 45° with the positive x -axis, then the value of $b^2 + c^2$ is :

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

- (1) 90 (2) 83 (3) 93 (4) 97

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- Q.21** 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

Scan or tap for the full solution



- Q.22** Two equal sides of an isosceles triangle are along $-x + 2y = 4$ and $x + y = 4$. If m is the slope of its third side, then the sum of all possible distinct values of m is:

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

- (1)
- $-2\sqrt{10}$
- (2) 12
-
- (3) -6 (4) 6

Scan or tap for the full solution



Section B (Numerical) — 4 questions

- Q.23** 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.24** 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.25** 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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- Q.26** Let $A(4, -2)$, $B(1, 1)$ and $C(9, -3)$ be the vertices of a triangle ABC . Then the maximum area of the parallelogram $AFDE$, formed with vertices D, E and F on the sides BC, CA and AB of the triangle ABC respectively, is _____.

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

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ANSWER KEY

Section A (MCQ) — 22 questions

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	2	4	1	3	3	2	2	1	3	2	3
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	1	1	2	4	1	3	2	2	4	2	4

Section B (Numerical) — 4 questions

Ques.	23	24	25	26							
Ans.	7	9	2	3							