

PYQSide

JEE MAIN THREE DIMENSIONAL GEOMETRY — PYQS

Max. Marks: 212

Questions: 53

Section A (MCQ)

- Q.1** Let the foot of perpendicular from the point $(\lambda, 2, 3)$ on the line $\frac{x-4}{1} = \frac{y-9}{2} = \frac{z-5}{1}$ be the point $(1, \mu, 2)$.

Then the distance between the lines

$$\frac{x-1}{2} = \frac{y-2}{3} = \frac{z+4}{6} \text{ and } \frac{x-\lambda}{2} = \frac{y-\mu}{3} = \frac{z+5}{6} \text{ is equal to :}$$

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) $\frac{12}{7}$ (2) $\frac{\sqrt{145}}{7}$ (3) $\frac{\sqrt{146}}{7}$ (4) $\frac{\sqrt{143}}{7}$

Scan or tap for the full solution



- Q.2** Let the image of the point $P(1, 6, a)$ in the line $L: \frac{x}{1} = \frac{y-1}{2} = \frac{z-a+1}{b}$, $b > 0$, be $(\frac{a}{3}, 0, a+c)$. If

$S(\alpha, \beta, \gamma)$, $\alpha > 0$, is the point on L such that the distance of S from the foot of perpendicular from the point P on L is $2\sqrt{14}$, then $\alpha + \beta + \gamma$ is equal to :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) 19 (2) 20 (3) 21 (4) 22

Scan or tap for the full solution



- Q.3** Let a line L be perpendicular to both the lines

$$L_1: \frac{x+1}{3} = \frac{y+3}{5} = \frac{z+5}{7} \text{ and}$$

$$L_2: \frac{x-2}{1} = \frac{y-4}{4} = \frac{z-6}{7}. \text{ If } \theta \text{ is the acute angle}$$

between the lines L and $L_3: \frac{x-\frac{8}{7}}{2} = \frac{y-\frac{4}{7}}{1} = \frac{z}{2}$, then

$\tan \theta$ is equal to :

[JEE Main 2026 (Online) 6th April Morning Shift]

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

Scan or tap for the full solution



- Q.4** The shortest distance between the lines

$$\frac{x-4}{1} = \frac{y-3}{2} = \frac{z-2}{-3} \text{ and } \frac{x+2}{2} = \frac{y-6}{4} = \frac{z-5}{-5} \text{ is :}$$

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) $\frac{5\sqrt{6}}{6}$ (2) $2\sqrt{5}$ (3) $3\sqrt{5}$ (4) $4\sqrt{5}$

Scan or tap for the full solution



- Q.5** The square of the distance of the point $P(5, 6, 7)$ from the line $\frac{x-2}{2} = \frac{y-5}{3} = \frac{z-2}{4}$ is equal to :

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

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

Scan or tap for the full solution



- Q.6** The square of the distance of the point of intersection of the lines $\vec{r} = (\hat{i} + \hat{j} - \hat{k}) + \lambda(\hat{a}\hat{i} - \hat{j})$, $\hat{a} \neq 0$ and $\vec{r} = (4\hat{i} - \hat{k}) + \mu(2\hat{i} + \hat{a}\hat{k})$ from the origin is :

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

- (1) 5 (2) 10 (3) 17 (4) 26

Scan or tap for the full solution



- Q.7** Let a triangle PQR be such that P and Q lie on the line $\frac{x+3}{8} = \frac{y-4}{2} = \frac{z+1}{2}$ and are at a distance of 6 units from $R(1, 2, 3)$. If (α, β, γ) is the centroid of ΔPQR , then $\alpha + \beta + \gamma$ is equal to :

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

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

Scan or tap for the full solution



- Q.8** If the distance of the point $(a, 2, 5)$ from the image of the point $(1, 2, 7)$ in the line $\frac{x}{1} = \frac{y-1}{1} = \frac{z-2}{2}$ is 4, then the sum of all possible values of a is equal to :

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

- (1) 11 (2) 9 (3) 6 (4) 4

Scan or tap for the full solution



- Q.9** A line with direction ratios $1, -1, 2$ intersects the lines $\frac{x}{2} = \frac{y}{3} = \frac{z+1}{3}$ and $\frac{x+1}{-1} = \frac{y-2}{1} = \frac{z}{4}$ at the points P and Q , respectively. If the length of the line segment PQ is α , then $225\alpha^2$ is equal to :

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

- (1) 1024 (2) 1014 (3) 1104 (4) 1204

Scan or tap for the full solution



Q.10 The square of the distance of the point $(-2, -8, 6)$ from the line $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z}{-1}$ along the line $\frac{x+5}{1} = \frac{y+5}{-1} = \frac{z}{2}$ is equal to:

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

- (1) 3 (2) 6 (3) 8 (4) 12

Scan or tap for the full solution



Q.11 The shortest distance between the lines

$$\vec{r} = \left(\frac{1}{3}\hat{i} + 2\hat{j} + \frac{8}{3}\hat{k}\right) + \lambda(2\hat{i} - 5\hat{j} + 6\hat{k})$$

$$\text{and } \vec{r} = \left(-\frac{2}{3}\hat{i} - \frac{1}{3}\hat{k}\right) + \mu(\hat{j} - \hat{k}), \lambda, \mu \in \mathbb{R}, \text{ is :}$$

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

- (1) $\sqrt{5}$ (2) 3 (3) $2\sqrt{3}$ (4) $\sqrt{15}$

Scan or tap for the full solution



Q.12 If $\left(2\alpha + 1, \alpha^2 - 3\alpha, \frac{\alpha - 1}{2}\right)$ is the image of $(\alpha, 2\alpha, 1)$ in the line $\frac{x-2}{3} = \frac{y-1}{2} = \frac{z}{1}$, then the possible value(s) of α is (are)

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

- (1) Only 3 (2) Only 3 and -1
(3) Only 3, $\frac{1}{4}$ and -1 (4) Only 3 and $\frac{1}{4}$

Scan or tap for the full solution



Q.13 If the point of intersection of the lines $\frac{x+1}{3} = \frac{y+a}{5} = \frac{z+b+1}{7}$ and $\frac{x-2}{1} = \frac{y-b}{4} = \frac{z-2a}{7}$ lies on xy-plane, then the value of $a + b$ is :

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

- (1) 2 (2) 5 (3) 7 (4) 9

Scan or tap for the full solution



Q.14 Let a line L passing through the point $(1, 1, 1)$ be perpendicular to both the vectors $2\hat{i} + 2\hat{j} + \hat{k}$ and $\hat{i} + 2\hat{j} + 2\hat{k}$. If $P(a, b, c)$ is the foot of perpendicular from the origin on the line L , then the value of $34(a + b + c)$ is :

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

- (1) 50 (2) 80 (3) 100 (4) 120

Scan or tap for the full solution



Q.15 Let the point A be the foot of perpendicular drawn from the point $P(a, b, 0)$ on the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-\alpha}{3}$.

If the midpoint of the line segment PA is $\left(0, \frac{3}{4}, -\frac{1}{4}\right)$, then the value of $a^2 + b^2 + \alpha^2$ is equal to :

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

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

Scan or tap for the full solution



Q.16 If the distances of the point $(1, 2, a)$ from the line $\frac{x-1}{1} = \frac{y}{2} = \frac{z-1}{1}$ along the lines

$$L_1: \frac{x-1}{3} = \frac{y-2}{4} = \frac{z-a}{b} \text{ and } L_2: \frac{x-1}{1} = \frac{y-2}{4} = \frac{z-a}{c}$$

are equal, then $a + b + c$ is equal to

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

- (1) 4 (2) 6 (3) 7 (4) 5

Scan or tap for the full solution



Q.17 Let $Q(a, b, c)$ be the image of the point $P(3, 2, 1)$ in the line $\frac{x-1}{1} = \frac{y}{2} = \frac{z-1}{1}$. Then the distance of Q from the line $\frac{x-9}{3} = \frac{y-9}{2} = \frac{z-5}{-2}$ is

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

- (1) 8 (2) 7 (3) 6 (4) 5

Scan or tap for the full solution



Q.18 Let the lines

$$L_1: \vec{r} = \hat{i} + 2\hat{j} + 3\hat{k} + \lambda(2\hat{i} + 3\hat{j} + 4\hat{k}), \lambda \in \mathbb{R} \text{ and}$$

$$L_2: \vec{r} = (4\hat{i} + \hat{j}) + \mu(5\hat{i} + 2\hat{j} + \hat{k}), \mu \in \mathbb{R}, \text{ intersect at the point } R. \text{ Let } P \text{ and } Q \text{ be the points lying on lines } L_1 \text{ and } L_2, \text{ respectively, such that } |\vec{PR}| = \sqrt{29} \text{ and}$$

$$|\vec{PQ}| = \sqrt{\frac{47}{3}}. \text{ If the point } P \text{ lies in the first octant, then } 27(QR)^2 \text{ is equal to}$$

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

- (1) 360 (2) 348 (3) 320 (4) 340

Scan or tap for the full solution



Q.19 The sum of all values of α , for which the shortest distance between the lines $\frac{x+1}{\alpha} = \frac{y-2}{-1} = \frac{z-4}{-\alpha}$ and

$$\frac{x}{\alpha} = \frac{y-1}{2} = \frac{z-1}{2\alpha} \text{ is } \sqrt{2}, \text{ is}$$

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

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

Scan or tap for the full solution



- Q.20** Let the direction cosines of two lines satisfy the equations : $4l + m - n = 0$ and $2mn + 10nl + 3lm = 0$. Then the cosine of the acute angle between these lines is :

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

(1) $\frac{10}{7\sqrt{38}}$ (2) $\frac{10}{\sqrt{38}}$ (3) $\frac{10}{3\sqrt{38}}$ (4) $\frac{20}{3\sqrt{38}}$

Scan or tap for the full solution



- Q.21** The vertices B and C of a triangle ABC lie on the line $\frac{x}{1} = \frac{1-y}{-2} = \frac{z-2}{3}$. The coordinates of A and B are (1, 6, 3) and (4, 9, α) respectively and C is at a distance of 10 units from B. The area (in sq. units) of $\triangle ABC$ is :

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

(1) $20\sqrt{13}$ (2) $5\sqrt{13}$
(3) $15\sqrt{13}$ (4) $10\sqrt{13}$

Scan or tap for the full solution



- Q.22** Let $P(\alpha, \beta, \gamma)$ be the point on the line $\frac{x-1}{2} = \frac{y+1}{-3} = z$ at a distance $4\sqrt{14}$ from the point (1, -1, 0) and nearer to the origin. Then the shortest distance, between the lines $\frac{x-\alpha}{1} = \frac{y-\beta}{2} = \frac{z-\gamma}{3}$ and $\frac{x+5}{2} = \frac{y-10}{1} = \frac{z-3}{1}$, is equal to

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

(1) $4\sqrt{\frac{7}{5}}$ (2) $7\sqrt{\frac{5}{4}}$ (3) $4\sqrt{\frac{5}{7}}$ (4) $2\sqrt{\frac{7}{4}}$

Scan or tap for the full solution



- Q.23** If the image of the point $P(1, 2, a)$ in the line $\frac{x-6}{3} = \frac{y-7}{2} = \frac{z-2}{2}$ is $Q(5, b, c)$, then $a^2 + b^2 + c^2$ is equal to

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

(1) 298 (2) 264 (3) 293 (4) 283

Scan or tap for the full solution



- Q.24** Let L be the line $\frac{x+1}{2} = \frac{y+1}{3} = \frac{z+3}{6}$ and let S be the set of all points (a, b, c) on L, whose distance from the line $\frac{x+1}{2} = \frac{y+1}{3} = \frac{z-9}{0}$ along the line L is 7. Then $\sum_{(a, b, c) \in S} (a+b+c)$ is equal to :

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

(1) 28 (2) 6 (3) 40 (4) 34

Scan or tap for the full solution



- Q.25** Let (α, β, γ) be the co-ordinates of the foot of the perpendicular drawn from the point (5, 4, 2) on the line $\vec{r} = (-\hat{i} + 3\hat{j} + \hat{k}) + \lambda(2\hat{i} + 3\hat{j} - \hat{k})$.

Then the length of the projection of the vector $\alpha\hat{i} + \beta\hat{j} + \gamma\hat{k}$ on the vector $6\hat{i} + 2\hat{j} + 3\hat{k}$ is :

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

(1) $\frac{18}{7}$ (2) $\frac{15}{7}$ (3) 4 (4) 3

Scan or tap for the full solution



- Q.26** Let the line L pass through the point (-3, 5, 2) and make equal angles with the positive coordinate axes. If the distance of L from the point (-2, r, 1) is $\sqrt{\frac{14}{3}}$, then the sum of all possible values of r is :

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

(1) 16 (2) 12 (3) 6 (4) 10

Scan or tap for the full solution



- Q.27** Let the line L_1 be parallel to the vector $-3\hat{i} + 2\hat{j} + 4\hat{k}$ and pass through the point (2, 6, 7), and the line L_2 be parallel to the vector $2\hat{i} + \hat{j} + 3\hat{k}$ and pass through the point (4, 3, 5). If the line L_3 is parallel to the vector $-3\hat{i} + 5\hat{j} + 16\hat{k}$ and intersects the lines L_1 and L_2 at the points C and D, respectively, then $|\vec{CD}|^2$ is equal to:

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

(1) 290 (2) 171 (3) 89 (4) 312

Scan or tap for the full solution



- Q.28** Let the values of λ for which the shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-\lambda}{3} = \frac{y-4}{4} = \frac{z-5}{5}$ is $\frac{1}{\sqrt{6}}$ be λ_1 and λ_2 . Then the radius of the circle passing through the points (0, 0), (λ_1, λ_2) and (λ_2, λ_1) is

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

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

Scan or tap for the full solution



- Q.29** Let the line L pass through (1, 1, 1) and intersect the lines $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{4}$ and $\frac{x-3}{1} = \frac{y-4}{2} = \frac{z}{1}$. Then, which of the following points lies on the line L?

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

- (1) (7, 15, 13) (2) (4, 22, 7)
(3) (10, -29, -50) (4) (5, 4, 3)

Scan or tap for the full solution



Q.30 If the shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x}{1} = \frac{y}{\alpha} = \frac{z-5}{1}$ is $\frac{5}{\sqrt{6}}$, then the sum of all possible values of α is

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

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

Scan or tap for the full solution



Q.31 If the equation of the line passing through the point $(0, -\frac{1}{2}, 0)$ and perpendicular to the lines

$$\vec{r} = \lambda(\hat{i} + \hat{a} + \hat{b}\hat{k}) \text{ and}$$

$$\vec{r} = (\hat{i} - \hat{j} - 6\hat{k}) + \mu(-\hat{b}\hat{i} + \hat{a}\hat{j} + 5\hat{k}) \text{ is}$$

$$\frac{x-1}{-2} = \frac{y+4}{d} = \frac{z-c}{-4}, \text{ then } a + b + c + d \text{ is equal to :}$$

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

- (1) 13 (2) 14 (3) 12 (4) 10

Scan or tap for the full solution



Q.32 Consider the lines $L_1: x - 1 = y - 2 = z$ and $L_2: x - 2 = y = z - 1$. Let the feet of the perpendiculars from the point $P(5, 1, -3)$ on the lines L_1 and L_2 be Q and R respectively. If the area of the triangle PQR is A , then $4A^2$ is equal to :

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

- (1) 151 (2) 147 (3) 139 (4) 143

Scan or tap for the full solution



Q.33 Let the shortest distance between the lines $\frac{x-3}{3} = \frac{y-\alpha}{-1} = \frac{z-3}{1}$ and $\frac{x+3}{-3} = \frac{y+7}{2} = \frac{z-\beta}{4}$ be $3\sqrt{30}$. Then the positive value of $5\alpha + \beta$ is

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

- (1) 42 (2) 40 (3) 48 (4) 46

Scan or tap for the full solution



Q.34 Let A and B be two distinct points on the line $L: \frac{x-6}{3} = \frac{y-7}{2} = \frac{z-7}{-2}$. Both A and B are at a distance $2\sqrt{17}$ from the foot of perpendicular drawn from the point $(1, 2, 3)$ on the line L . If O is the origin, then $\vec{OA} \cdot \vec{OB}$ is equal to

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

- (1) 49 (2) 21 (3) 47 (4) 62

Scan or tap for the full solution



Q.35 Let A be the point of intersection of the lines

$$L_1: \frac{x-7}{1} = \frac{y-5}{0} = \frac{z-3}{-1} \text{ and}$$

$L_2: \frac{x-1}{3} = \frac{y+3}{4} = \frac{z+7}{5}$. Let B and C be the points on the lines L_1 and L_2 respectively such that $AB = AC = \sqrt{15}$. Then the square of the area of the triangle ABC is :

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

- (1) 63 (2) 57 (3) 60 (4) 54

Scan or tap for the full solution



Q.36 Let the values of p , for which the shortest distance between the lines $\frac{x+1}{3} = \frac{y}{4} = \frac{z}{5}$ and

$$\vec{r} = (p\hat{i} + 2\hat{j} + \hat{k}) + \lambda(2\hat{i} + 3\hat{j} + 4\hat{k}) \text{ is } \frac{1}{\sqrt{6}}, \text{ be}$$

a, b , ($a < b$). Then the length of the latus rectum of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is :

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

- (1) $\frac{3}{2}$ (2) 9 (3) 18 (4) $\frac{2}{3}$

Scan or tap for the full solution



Q.37 Let a line passing through the point $(4, 1, 0)$ intersect the line $L_1: \frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ at the point $A(\alpha, \beta, \gamma)$ and the line $L_2: x - 6 = y = -z + 4$ at the

point $B(a, b, c)$. Then $\begin{vmatrix} 1 & 0 & 1 \\ \alpha & \beta & \gamma \\ a & b & c \end{vmatrix}$ is equal to

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

- (1) 16 (2) 6 (3) 8 (4) 12

Scan or tap for the full solution



Q.38 Line L_1 passes through the point $(1, 2, 3)$ and is parallel to z -axis. Line L_2 passes through the point $(\lambda, 5, 6)$ and is parallel to y -axis. Let for $\lambda = \lambda_1, \lambda_2$, $\lambda_2 < \lambda_1$, the shortest distance between the two lines be 3. Then the square of the distance of the point $(\lambda_1, \lambda_2, 7)$ from the line L_1 is

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

- (1) 25 (2) 32 (3) 40 (4) 37

Scan or tap for the full solution



- Q.39** Each of the angles β and γ that a given line makes with the positive y- and z-axes, respectively, is half of the angle that this line makes with the positive x-axis. Then the sum of all possible values of the angle β is

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

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

Scan or tap for the full solution



- Q.40** The distance of the point (7, 10, 11) from the line

$$\frac{x-4}{1} = \frac{y-4}{0} = \frac{z-2}{3} \text{ along the line}$$

$$\frac{x-9}{2} = \frac{y-13}{3} = \frac{z-17}{6} \text{ is}$$

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

- (1) 16 (2) 12 (3) 18 (4) 14

Scan or tap for the full solution



- Q.41** Let the vertices Q and R of the triangle PQR lie on the line $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$, $QR = 5$ and the coordinates of the point P be (0, 2, 3). If the area of the triangle PQR is $\frac{m}{n}$ then :

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

- (1) $2m - 5\sqrt{21}n = 0$ (2) $m - 5\sqrt{21}n = 0$
(3) $5m - 21\sqrt{2}n = 0$ (4) $5m - 2\sqrt{21}n = 0$

Scan or tap for the full solution



- Q.42** If the image of the point P(1, 0, 3) in the line joining the points A(4, 7, 1) and B(3, 5, 3) is Q(α , β , γ), then $\alpha + \beta + \gamma$ is equal to :

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

- (1) $\frac{46}{3}$ (2) 18 (3) 13 (4) $\frac{47}{3}$

Scan or tap for the full solution



- Q.43** The line L_1 is parallel to the vector $\vec{a} = -3\hat{i} + 2\hat{j} + 4\hat{k}$ and passes through the point (7, 6, 2) and the line L_2 is parallel to the vector $\vec{b} = 2\hat{i} + \hat{j} + 3\hat{k}$ and passes through the point (5, 3, 4). The shortest distance between the lines L_1 and L_2 is :

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

- (1) $\frac{23}{\sqrt{38}}$ (2) $\frac{21}{\sqrt{38}}$ (3) $\frac{23}{\sqrt{57}}$ (4) $\frac{21}{\sqrt{57}}$

Scan or tap for the full solution



- Q.44** Let $L_1 : \frac{x-1}{1} = \frac{y-2}{-1} = \frac{z-1}{2}$ and

$$L_2 : \frac{x+1}{-1} = \frac{y-2}{2} = \frac{z}{1} \text{ be two lines.}$$

Let L_3 be a line passing through the point (α , β , γ) and be perpendicular to both L_1 and L_2 . If L_3 intersects L_1 , then $|5\alpha - 11\beta - 8\gamma|$ equals :

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

- (1) 25 (2) 20 (3) 16 (4) 18

Scan or tap for the full solution



- Q.45** Let $\vec{a} = \hat{i} + 2\hat{j} + \hat{k}$ and $\vec{b} = 2\hat{i} + 7\hat{j} + 3\hat{k}$. Let

$$L_1 : \vec{r} = (-\hat{i} + 2\hat{j} + \hat{k}) + \lambda\vec{a}, \lambda \in \mathbf{R} \text{ and}$$

$L_2 : \vec{r} = (\hat{j} + \hat{k}) + \mu\vec{b}, \mu \in \mathbf{R}$ be two lines. If the line L_3 passes through the point of intersection of L_1 and L_2 and is parallel to $\vec{a} + \vec{b}$, then L_3 passes through the point :

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

- (1) (-1, -1, 1) (2) (2, 8, 5)
(3) (8, 26, 12) (4) (5, 17, 4)

Scan or tap for the full solution



- Q.46** If the image of the point (4, 4, 3) in the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-1}{3}$ is (α , β , γ), then $\alpha + \beta + \gamma$ is equal to

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

- (1) 12 (2) 9 (3) 7 (4) 8

Scan or tap for the full solution



- Q.47** The square of the distance of the point $\left(\frac{15}{7}, \frac{32}{7}, 7\right)$ from the line $\frac{x+1}{3} = \frac{y+3}{5} = \frac{z+5}{7}$ in the direction of the vector $\hat{i} + 4\hat{j} + 7\hat{k}$ is:

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

- (1) 66 (2) 54 (3) 41 (4) 44

Scan or tap for the full solution



Section B (Numerical)

- Q.48** Let a line L_1 pass through the origin and be perpendicular to the lines
- $$L_2 : \vec{r} = (3+t)\hat{i} + (2t-1)\hat{j} + (2t+4)\hat{k} \text{ and}$$
- $$L_3 : \vec{r} = (3+2s)\hat{i} + (3+2s)\hat{j} + (2+s)\hat{k}, t, s \in \mathbf{R}.$$
- If (a , b , c), $a \in \mathbf{Z}$, is the point on L_3 at a distance of $\sqrt{17}$ from the point of intersection of L_1 and L_2 , then $(a+b+c)^2$ is equal to _____.

[JEE Main 2026 (Online) 8th April Evening Shift]

Scan or tap for the
full solution

- Q.49** Let the image of the point $P(0, -5, 0)$ in the line $\frac{x-1}{2} = \frac{y}{1} = \frac{z+1}{-2}$ be the point R and the image of the point $Q\left(0, \frac{-1}{2}, 0\right)$ in the line $\frac{x-1}{-1} = \frac{y+9}{4} = \frac{z+1}{1}$ be the point S . Then the square of the area of the parallelogram $PQRS$ is _____.

[JEE Main 2026 (Online) 6th April Evening Shift]

Scan or tap for the
full solution

- Q.50** If the distance of the point $P(43, \alpha, \beta)$, $\beta < 0$, from the line $\vec{r} = 4\hat{i} - \hat{k} + \mu(2\hat{i} + 3\hat{k})$, $\mu \in \mathbb{R}$ along a line with direction ratios $3, -1, 0$ is $13\sqrt{10}$, then $\alpha^2 + \beta^2$ is equal to _____

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

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full solution

- Q.51** Let a line L passing through the point $P(1, 1, 1)$ be perpendicular to the lines $\frac{x-4}{4} = \frac{y-1}{1} = \frac{z-1}{1}$ and $\frac{x-17}{1} = \frac{y-71}{1} = \frac{z}{0}$. Let the line L intersect the yz -plane at the point Q . Another line parallel to L and passing through the point $S(1, 0, -1)$ intersects the yz -plane at the point R . Then the square of the area of the parallelogram $PQRS$ is equal to _____.

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

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full solution

- Q.52** If the image of the point $P(a, 2, a)$ in the line $\frac{x}{2} = \frac{y+a}{1} = \frac{z}{1}$ is Q and the image of Q in the line $\frac{x-2b}{2} = \frac{y-a}{1} = \frac{z+2b}{-5}$ is P , then $a + b$ is equal to _____.

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

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full solution

- Q.53** Let the area of the triangle formed by the lines $x+2 = y-1 = z$, $\frac{x-3}{5} = \frac{y}{-1} = \frac{z-1}{1}$ and $\frac{x}{-3} = \frac{y-3}{3} = \frac{z-2}{1}$ be A . Then A^2 is equal to _____.

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

Scan or tap for the
full solution

ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	3	2	3	3	3	3	3	2	2	2
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	1	3	3	1	3	2	1	1	3	2	1
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	1	4	1	4	1	2	1	3	2	2	4
Ques.	34	35	36	37	38	39	40	41	42	43	44
Ans.	3	4	4	3	1	3	4	1	1	1	1
Ques.	45	46	47								
Ans.	3	2	1								

Section B (Numerical)

Ques.	48	49	50	51	52	53	
Ans.	4	162	170	6	3	56	