

PYQSide

JEE MAIN THREE DIMENSIONAL GEOMETRY — SHORTEST DISTANCE BETWEEN TWO LINES (SKEW LINES) — PYQS

Max. Marks: 44

Questions: 11

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 $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z+4}{6}$ and $\frac{x-\lambda}{2} = \frac{y-\mu}{3} = \frac{z+5}{6}$ 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 The shortest distance between the lines $\frac{x-4}{1} = \frac{y-3}{2} = \frac{z-2}{-3}$ and $\frac{x+2}{2} = \frac{y-6}{4} = \frac{z-5}{-5}$ is : [JEE Main 2026 (Online) 6th April Evening Shift]

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

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Q.3 The shortest distance between the lines $\vec{r} = \left(\frac{1}{3}\hat{i} + 2\hat{j} + \frac{8}{3}\hat{k}\right) + \lambda(2\hat{i} - 5\hat{j} + 6\hat{k})$ and $\vec{r} = \left(-\frac{2}{3}\hat{i} - \frac{1}{3}\hat{k}\right) + \mu(\hat{j} - \hat{k})$, $\lambda, \mu \in \mathbb{R}$, is : [JEE Main 2026 (Online) 4th April Evening Shift]

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

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Q.4 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 $\frac{x}{\alpha} = \frac{y-1}{2} = \frac{z-1}{2\alpha}$ is $\sqrt{2}$, is

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

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

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Q.5 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.6 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

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Q.7 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) $-\frac{3}{2}$

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Q.8 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

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- Q.9** Let the values of p , for which the shortest distance between the lines $\frac{x+1}{3} = \frac{y}{4} = \frac{z}{5}$ and $\vec{r} = (p\hat{i} + 2\hat{j} + \hat{k}) + \lambda(2\hat{i} + 3\hat{j} + 4\hat{k})$ is $\frac{1}{\sqrt{6}}$, 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) $\frac{2}{3}$

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- Q.10** 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

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- Q.11** 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) $\frac{21}{\sqrt{57}}$

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	3	2	1	1	2	3	4	4	1	1