

PYQSide

JEE MAIN DETERMINANTS — CONSISTENCY OF SYSTEM OF EQUATIONS, CRAMER'S RULE (JEE) — PYQS

Max. Marks: 52

Questions: 13

Section A (MCQ)

- Q.1** If the system of linear equations :
 $x + y + z = 6$,
 $x + 2y + 5z = 10$,
 $2x + 3y + \lambda z = \mu$
 has infinitely many solutions, then the value of $\lambda + \mu$ equals :

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

- (1) 12 (2) 16 (3) 22 (4) 28

Scan or tap for the full solution



- Q.2** The sum of all possible values of $\theta \in [0, 2\pi]$, for which the system of equations :
 $x \cos 3\theta - 8y - 12z = 0$
 $x \cos 2\theta + 3y + 3z = 0$
 $x + y + 3z = 0$
 has a non-trivial solution, is equal to :

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

- (1) π (2) 2π (3) 3π (4) 4π

Scan or tap for the full solution



- Q.3** Consider the system of linear equations in x, y, z :
 $x + 2y + tz = 0$
 $6x + y + 5tz = 0$
 $3x + t^2y + f(t)z = 0$
 where $f: \mathbb{R} \rightarrow \mathbb{R}$ is a differentiable function. If this system has infinitely many solutions for all $t \in \mathbb{R}$, then f

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

- (1) is a constant function
 (2) is strictly increasing on $\mathbb{R}$
 (3) is strictly decreasing on $\mathbb{R}$
 (4) has two critical points

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- Q.4** If the system of equations :
 $x + y + z = 5$
 $x + 2y + 3z = 9$
 $x + 3y + \lambda z = \mu$
 has infinitely many solutions, then the value of $\lambda + \mu$ is : [JEE Main 2026 (Online) 4th April Evening Shift]

- (1) 16 (2) 18 (3) 19 (4) 21

Scan or tap for the full solution



- Q.5** Let $\alpha, \beta \in \mathbb{R}$ be such that the system of linear equations
 $x + 2y + z = 5$
 $2x + y + \alpha z = 5$
 $8x + 4y + \beta z = 18$
 has no solution. Then $\frac{\beta}{\alpha}$ is equal to :

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

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

Scan or tap for the full solution



- Q.6** If the system of equations
 $x + 5y + 6z = 4$,
 $2x + 3y + 4z = 7$,
 $x + 6y + az = b$
 has infinitely many solutions, then the point (a, b) lies on the line

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

- (1) $y - x = 3$ (2) $x - y = 3$
 (3) $x + y = 11$ (4) $x + y = 12$

Scan or tap for the full solution



- Q.7** The system of linear equations
 $x + y + z = 6$
 $2x + 5y + az = 36$
 $x + 2y + 3z = b$
 has : [JEE Main 2026 (Online) 23rd January Evening Shift]
 (1) unique solution for $a = 8$ and $b = 16$
 (2) infinitely many solutions for $a = 8$ and $b = 14$
 (3) infinitely many solutions for $a = 8$ and $b = 16$
 (4) unique solution for $a = 8$ and $b = 14$

Scan or tap for the full solution



- Q.8** Let n be the number obtained on rolling a fair die. If the probability that the system
- $$\begin{aligned} x - ny + z &= 6 \\ x + (n-2)y + (n+1)z &= 8 \\ (n-1)y + z &= 1 \end{aligned}$$
- has a unique solution is $\frac{k}{6}$, then the sum of k and all possible values of n is :

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

- (1) 22 (2) 20 (3) 24 (4) 21

Scan or tap for the full solution



- Q.9** If the system of equations
- $$\begin{aligned} 3x + y + 4z &= 3 \\ 2x + \alpha y - z &= -3 \\ x + 2y + z &= 4 \end{aligned}$$
- has no solution, then the value of α is equal to:

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

- (1) 13 (2) 4 (3) 19 (4) 23

Scan or tap for the full solution



- Q.10** Let the system of equations :
- $$\begin{aligned} 2x + 3y + 5z &= 9 \\ 7x + 3y - 2z &= 8 \\ 12x + 3y - (4 + \lambda)z &= 16 - \mu \end{aligned}$$
- have infinitely many solutions. Then the radius of the circle centred at (λ, μ) and touching the line $4x = 3y$ is :

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

- (1)
- $\frac{7}{5}$
- (2)
- $\frac{21}{5}$
- (3) 7 (4)
- $\frac{17}{5}$

Scan or tap for the full solution



- Q.11** Let the system of equations
- $$\begin{aligned} x + 5y - z &= 1 \\ 4x + 3y - 3z &= 7 \\ 24x + y + \lambda z &= \mu \end{aligned}$$
- $\lambda, \mu \in \mathbb{R}$, have infinitely many solutions. Then the number of the solutions of this system, if x, y, z are integers and satisfy $7 \leq x + y + z \leq 77$, is :

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

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

Scan or tap for the full solution



- Q.12** If the system of linear equations
- $$\begin{aligned} 3x + y + \beta z &= 3 \\ 2x + \alpha y - z &= -3 \\ x + 2y + z &= 4 \end{aligned}$$
- has infinitely many solutions, then the value of $22\beta - 9\alpha$ is :

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

- (1) 31 (2) 37 (3) 43 (4) 49

Scan or tap for the full solution



- Q.13** If the system of equations
- $$\begin{aligned} 2x + \lambda y + 3z &= 5 \\ 3x + 2y - z &= 7 \\ 4x + 5y + \mu z &= 9 \end{aligned}$$
- has infinitely many solutions, then $(\lambda^2 + \mu^2)$ is equal to :

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

- (1) 30 (2) 26 (3) 22 (4) 18

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	4	2	2	2	2	2	1	3	1	3
Ques.	12	13									
Ans.	1	2									