



UDAAN



2026

Pair of Linear Equation in
Two Variables

MATHS

LECTURE-4

BY-RITIK SIR



Topics

to be covered



Questions on Conditions of Solvability



RITIK SIR

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Conditions for Solvability (or Consistency)



$$\begin{array}{l} 2x - 3y + 2 = 0 \\ 3x - ky + 3 = 0 \end{array}$$

$$\frac{2}{3} \quad \frac{-3}{-k} \quad \frac{2}{3}$$



#Q. For each of the following systems of equations determine the value of k for which the given system of equations has a unique solution:

(i) $2x + 3y - 5 = 0$

$kx - 6y - 8 = 0$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

$$\frac{2}{k} \neq \frac{3}{-6}$$

$$-12 \neq 3k$$

$$-\frac{12}{3} \neq k$$

$$k \neq -4$$

Ans: All real values of k except -4 .

#Q. For each of the following systems of equations determine the value of k for which the given system of equations has a unique solution:

$$(ii) \quad 2x + ky = 1$$

$$5x - 7y = 5$$

A $k \neq -7/5$

$$\frac{2}{5} \neq \frac{k}{-7}$$

B $k \neq -14/5$

$$\boxed{-\frac{14}{5} \neq k}$$

C $k = -14/5$

All real values of k except $-\frac{14}{5}$

D $k \neq 14/5$

#Q. For each of the following systems of equations determine the value of k for which the given system of equations has infinitely many solutions.

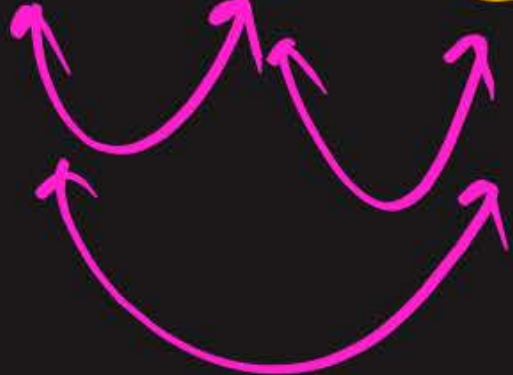
(i) $5x + 2y = k$

$10x + 4y = 3$

For infinite many solutions,

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

$$\frac{5}{10} = \frac{2}{4} = \frac{-k}{-3}$$



$$\frac{2}{4} = \frac{k}{-3}$$

$$\frac{6}{4} = k$$

$$\frac{3}{2} = k$$

$k=2$

$$\frac{5}{10} = \frac{2}{4} = \frac{-2}{-3}$$

$$\frac{1}{2} = \frac{1}{2} \neq \frac{2}{3}$$

no solution

#Q. For each of the following systems of equations determine the value of k for which the given system of equations has infinitely many solutions.

(ii) $kx + 3y = k - 3$

$12x + ky = k$

$$\begin{aligned} a_1 &= k & b_1 &= 3 & c_1 &= -k + 3 \\ a_2 &= 12 & b_2 &= k & c_2 &= -k \end{aligned}$$

$$\frac{k}{12} = \frac{3}{k}$$

$$k^2 = 36$$

$$k = \pm \sqrt{36}$$

$$k = +6, -6$$

$$k = -6$$

$$\frac{-6}{12} = \frac{3}{-6} = \frac{-(-6+3)}{-6}$$

$$\frac{-1}{2} = -\frac{1}{2} \neq \frac{3}{2} \rightarrow \text{no solution.}$$

check:

$$k = 6$$

$$\frac{6}{12} = \frac{3}{6} = \frac{-6+3}{-6}$$

$$\frac{1}{2} = \frac{1}{2} = \frac{1}{2}$$

A

3

B

4

C

5

D

6

#Q. For each of the following systems of equations determine the value of k for which the given system has no solutions.

(i) $3x - 4y + 7 = 0$

$kx + 3y - 5 = 0$

$$\frac{3}{k} = -\frac{4}{3} \neq \frac{7}{-5}$$

$$\frac{3}{k} = -\frac{4}{3}$$

$$9 = -4k$$

$$\boxed{-\frac{9}{4} = k}$$

check:

$$\frac{\frac{3}{k}}{-\frac{4}{3}} = -\frac{4}{3} \neq \frac{7}{-5}$$

$$\boxed{-\frac{9}{4} = -\frac{4}{3} \neq \frac{7}{-5}}$$

no solution.

#Q. For what value of k , will the system of equations $x + 2y = 5$ and $3x + ky - 15 = 0$ has no solution?

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$$

$$\frac{1}{3} = \frac{2}{k} \neq \frac{-5}{-15}$$

$$\frac{1}{3} = \frac{2}{k}$$

$$k = 6$$

check:

$$\frac{1}{3} \quad \frac{2}{6} \quad \frac{-5}{-15}$$

$$\frac{1}{3} = \frac{1}{3} = \frac{1}{3}$$

Infinitely many solution.

Ans: there is no value of 'k' for which the system will have a no solution.

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#GPM

#Q. For c if the system of equations $cx + 3y + 3 - c = 0$, $12x + cy - c = 0$ has infinitely many solutions?

COSE

What

#Q. For ~~value~~ value of α and β for which the following system of linear equations has

$$2x + 3y = 7$$

$$2\alpha x + (\alpha + \beta)y = 28$$

(i) infinite number of solutions

$$\frac{2}{2\alpha} = \frac{3}{\alpha + \beta} = \frac{-7}{-28}$$

$$\frac{2}{2\alpha} = \frac{-7}{-28}$$

$$\frac{1}{\alpha} = \frac{1}{4}$$

$$4 = \alpha$$

$$\frac{3}{\alpha + \beta} = \frac{-7}{-28}$$

$$\frac{3}{4 + \beta} = \frac{1}{4}$$

CBSE 2001, 23

$$12 = 4 + \beta$$

$$8 = \beta$$

#Q. For the value of α and β for which the following system of linear equations has

$$2x + 3y = 7$$

$$2\alpha x + (\alpha + \beta)y = 28$$

(ii) a unique solution

$$\downarrow$$

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

$$\frac{2}{2\alpha} \neq \frac{3}{\alpha + \beta}$$

$$2(\alpha + \beta) \neq 6\alpha$$

$$2\alpha + 2\beta \neq 6\alpha$$

$$2\beta \neq 6\alpha - 2\alpha$$

$$2\beta \neq 4\alpha$$

$$\boxed{\beta \neq 2\alpha}$$

When $\beta \neq 2\alpha$, then system will have a unique solution.

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#HOT



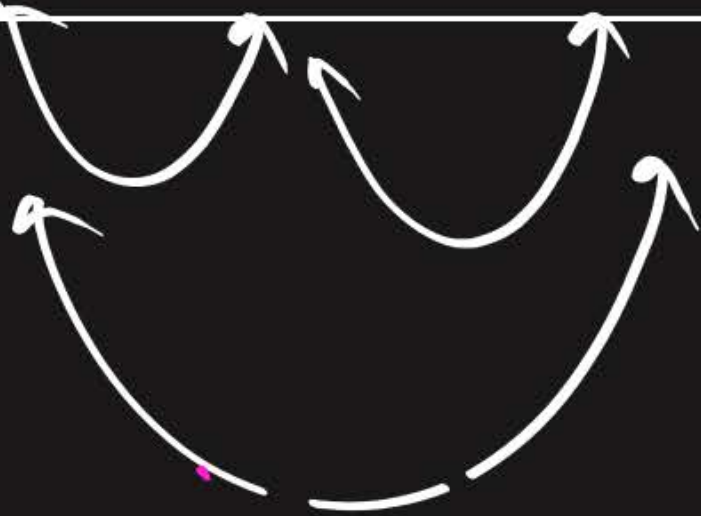
#Q. For the value of α and β for which the following system of linear equations has

$$2x + 3y = 7$$

$$2\alpha x + (\alpha + \beta)y = 28$$

(iii) no solution

$$\frac{2}{2\alpha} = \frac{3}{\alpha + \beta} \neq \frac{-7}{-28}$$



$$\frac{2}{2\alpha} = \frac{3}{\alpha + \beta}$$

$$2\alpha + 2\beta = 6\alpha$$

$$2\beta = 6\alpha - 2\alpha$$

$$2\beta = 4\alpha$$

$$\beta = 2\alpha$$

CBSE 2001, 23

$$\frac{2}{2\alpha} \neq \frac{1}{4}$$

$$8 \neq 2\alpha$$

$$4 \neq \alpha$$

$$8 \neq \beta$$

Ans: $\beta = 2\alpha$, but $\alpha \neq 4$, $\beta \neq 8$

#Q. The value of k for which the pair of equations $kx = y + 2$ and $6x = 2y + 3$ has infinitely many solutions, is

A $k = 3$

B does not exist

C $k = -3$

D $k = 4$

$$kx - y - 2 = 0$$

$$6x - 2y - 3 = 0$$

$$\frac{k}{6} = \frac{-1}{-2} = \frac{-2}{-3}$$

k ki jagah kuch bhi salah, infinite wala answer nahi aayega.

#Q. If $am \neq bl$, then the system of equations $ax + by = c$ and $lx + my = n$



A has a unique solution

B has no solution

C has infinitely many solutions

D may or may not have a solution.

$$\begin{array}{ll} a_1 = a & a_2 = l \\ b_1 = b & b_2 = m \\ c_1 = -c & c_2 = -n \end{array}$$

$$\frac{a}{l} \neq \frac{b}{m} \quad \frac{-c}{-n}$$

$$\frac{a}{l} \neq \frac{b}{m}$$

$am \neq bl$

$$\rightarrow 2x + 3y - 3 = 0$$

$$12x + 18y = 15$$

① $10x + 15y - 15 = 0$

② $\frac{1}{6} = \frac{1}{6} \neq \frac{1}{5}$

→ u $10x + 9y - 1 = 0$

$$\frac{1}{2} \neq \frac{1}{2}$$

#Q. One equation of a pair of dependent linear equations is $-5x + 7y = 2$.

The second equation is:

A $10x + 14y + 4 = 0$ ✗

B $-10x - 14y + 4 = 0$ ✗

C $-10x + 14y + 4 = 0$ ✗

D $10x - 14y = -4$ ✓

$$\begin{array}{ccc} -5 & 7 & -2 \\ \hline 10 & -14 & 4 \end{array}$$

$$\frac{-5}{10} = \frac{7}{-14} = \frac{-2}{4} = -\frac{1}{2}$$

$$\begin{array}{ccc} -\frac{1}{2} & -\frac{1}{2} & -\frac{2}{4} \end{array}$$

$$-\frac{1}{2} = -\frac{1}{2} = -\frac{1}{2}$$







2026
EXAMINATION



CBSE QUESTION & CONCEPT BANK

Chapter-wise & Topic-wise
with 50% Competency Questions

CLASS 10

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-  As per Latest Pattern
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STANDARD

Ritik Mishra

CLASS 10 (2025-26)



MATHEMATICS

MADE EASY

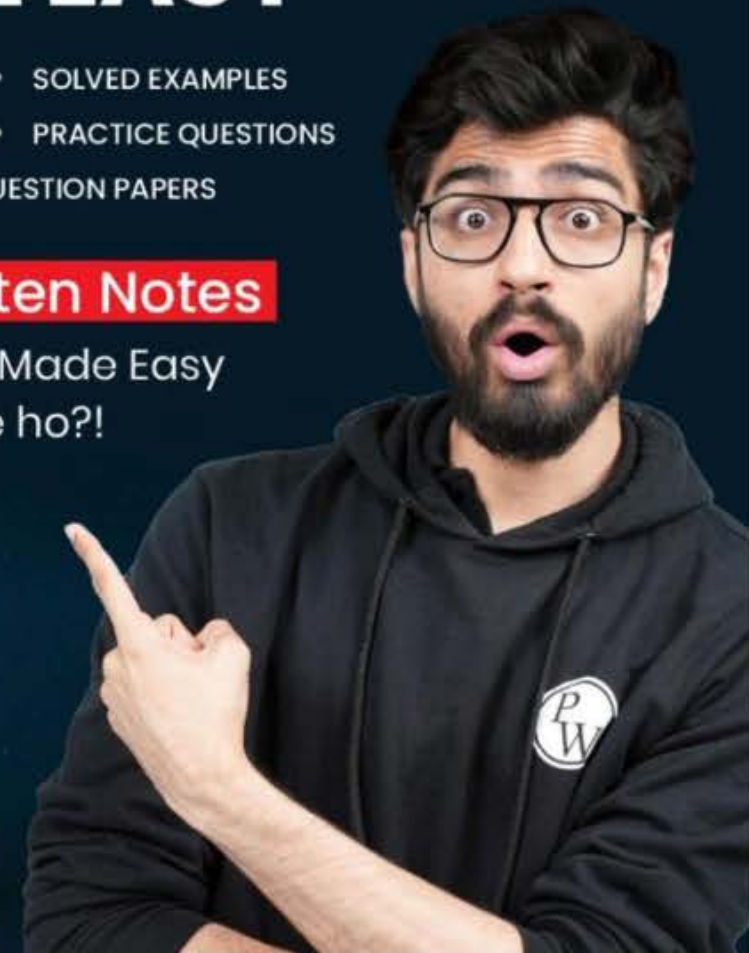
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Ritik Mishra





WORK HARD

DREAM BIG

NEVER GIVE UP



Thank
You