



UDDAAN



2026

~~Pair of Linear Equation in
Two Variables~~

MATHS

LECTURE-4

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Topics *to be covered*



Questions on Conditions of Solvability



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Conditions for Solvability (or Consistency)

$$\begin{aligned} 2x - 3y + 2 &= 0 \\ 3x - ky + 3 &= 0 \end{aligned}$$

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



#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:

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

$$kx - 6y - 8 = 0$$

$$k \neq -4$$

Ans: All real values of k except -4.

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

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

$$-12 \neq 3k$$

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

#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) $2x + ky = 1$

$$5x - 7y = 5$$

A $k \neq -7/5$

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

B $k \neq -14/5$

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

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.

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

$$10x + 4y = 3$$

For infinite many solutions,

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

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

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

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

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

$$\left\{ \begin{array}{l} k=2 \\ \begin{array}{rcc} 5 & 2 & -2 \\ 10 & 4 & 3 \\ \hline -2 & 2 & 2 \end{array} \end{array} \right.$$

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) $kx + 3y = k - 3$

$$12x + ky = k$$

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

A

3

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

B

4

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

C

5



D

6

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

$$k^2 = 36$$

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

$$k = +6, -6$$

$$k = -6$$

check:

$$k = 6$$

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

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

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

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

no solution.

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

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

$$kx + 3y - 5 = 0$$

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

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

$$9 = -4k$$

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

check:

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

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

nosolution

#Q. For what value of k, will the system of equations $x + 2y = 5$
 $3x + ky - 15 = 0$ 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:~~

$$\begin{array}{ccc} \frac{1}{3} & \frac{2}{6} & \frac{-5}{-15} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \end{array} \rightarrow \text{Infinite many solutions.}$$

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

~~HAPPY~~

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

~~CLOSE~~



What

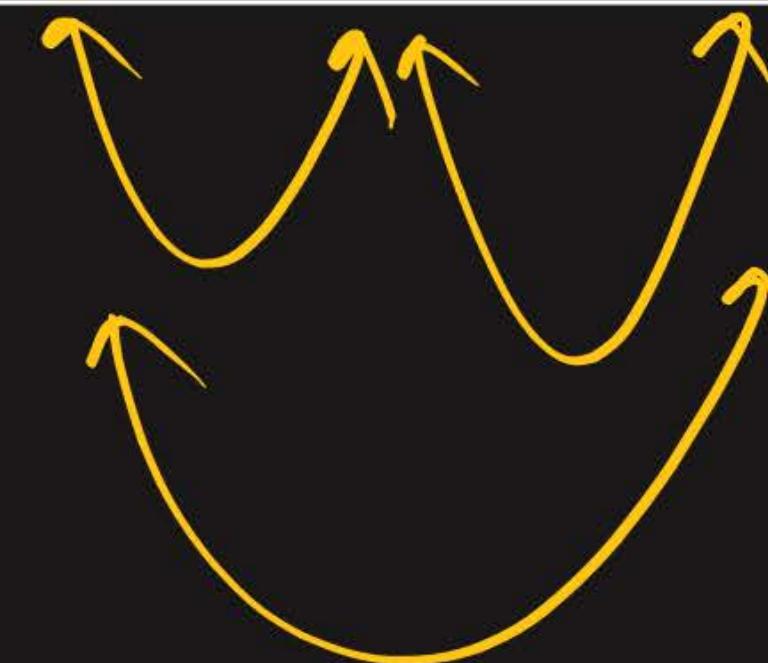
#Q. For ~~the~~ value of α and β for which the following system of linear equations has

$$2x + 3y = 7$$

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

(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



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

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

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

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

$$2\beta \neq 6x - 2x$$

$$2\beta \neq 4x$$

$$\beta \neq 2x$$

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

CBSE 2001, 23

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

~~HOT~~

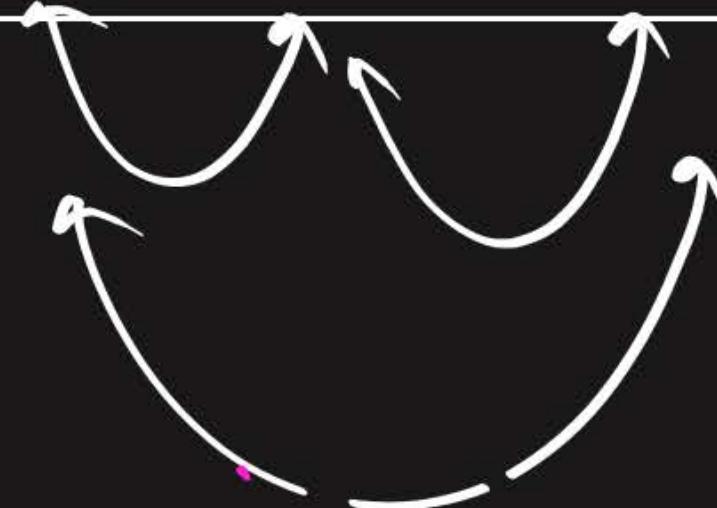
#Q. For the value of α and β for which the following system of linear equations has

$$2x + 3y = 7$$

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

(iii) no solution

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



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

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

$$2\beta = 6x - 2x$$

$$2\beta = 4x$$

$$\beta = 2x$$

CBSE 2001, 23

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

$$8 \neq 2x$$

$$4 \neq x$$

$$8 \neq \beta$$

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

#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 $k = 4$

$$\begin{aligned}kx - y - 2 &= 0 \\6x - 2y - 3 &= 0\end{aligned}$$

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

k hi jagah leuch bhi daalhe,
infinik wala answer nahie ayega.

#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.

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

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

am \neq bl

$$\rightarrow 2x+3y-3=0 \quad \text{---} \quad 12x+18y-15$$

(1) $10x+15y-15=0$ (2) $\frac{1}{6} = \frac{1}{6} \neq \frac{1}{5}$

u

$$10x+9y-3=0$$

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

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

The second equation is:

A

$$10x + 14y + 4 = 0 \quad \times$$

B

$$-10x - 14y + 4 = 0 \quad \times$$

C

$$-10x + 14y + 4 = 0 \quad \times$$

D

$$10x - 14y = -4$$

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

$$\begin{array}{r} -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} \\ \hline -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} \\ \hline \end{array}$$

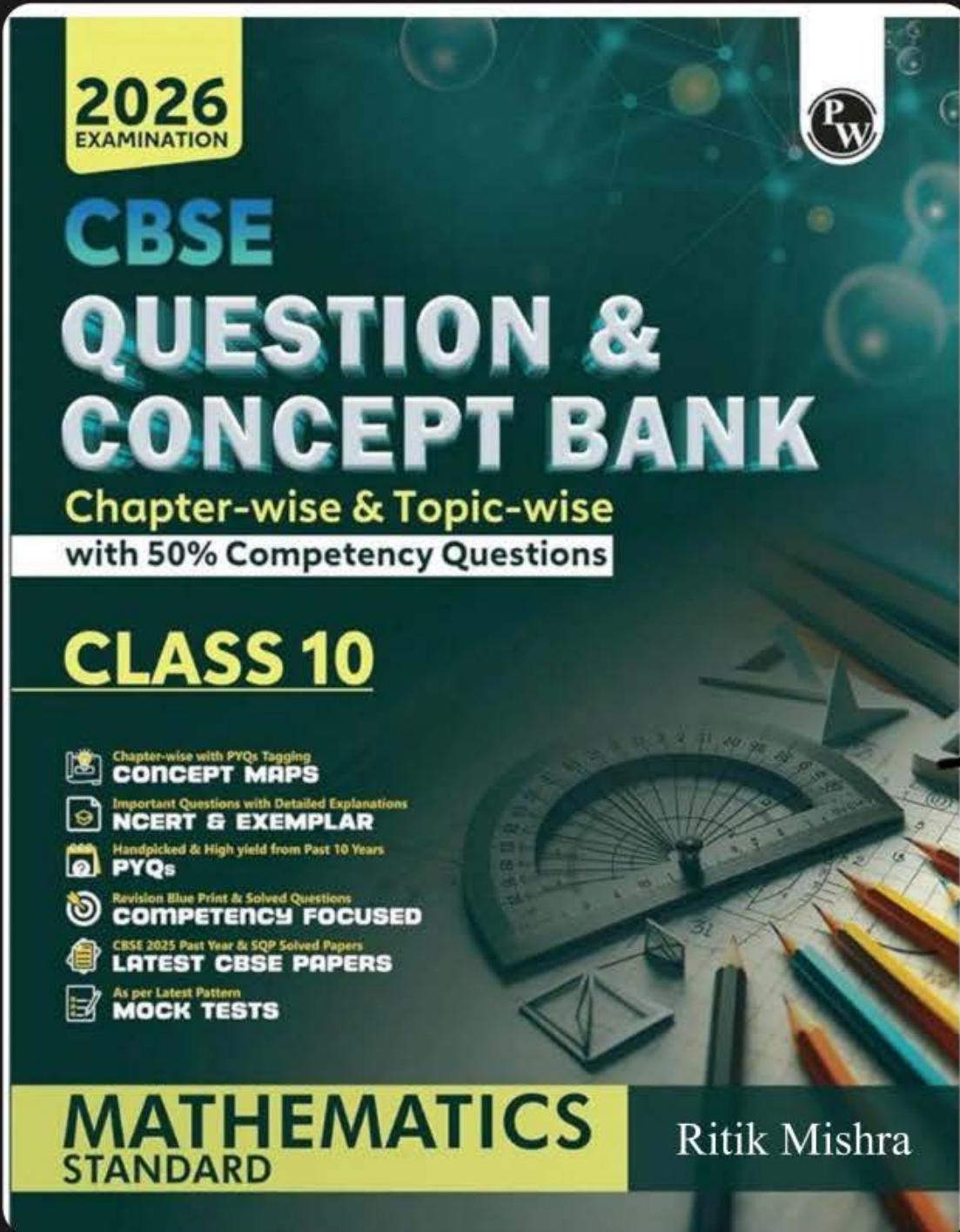
$$\begin{array}{r} -5 & 7 & -2 \\ \hline 10 & -14 & 4 \\ \hline \end{array}$$

$\times -2$

$$\begin{array}{r} 10 & -14 & 4 \\ \hline -10 & 14 & -8 \\ \hline \end{array}$$

$\times -1$

$$\begin{array}{r} 10 & -14 & 4 \\ \hline 0 & 0 & -4 \\ \hline \end{array}$$



CLASS 10 (2025-26)



MATHEMATICS MADE EASY

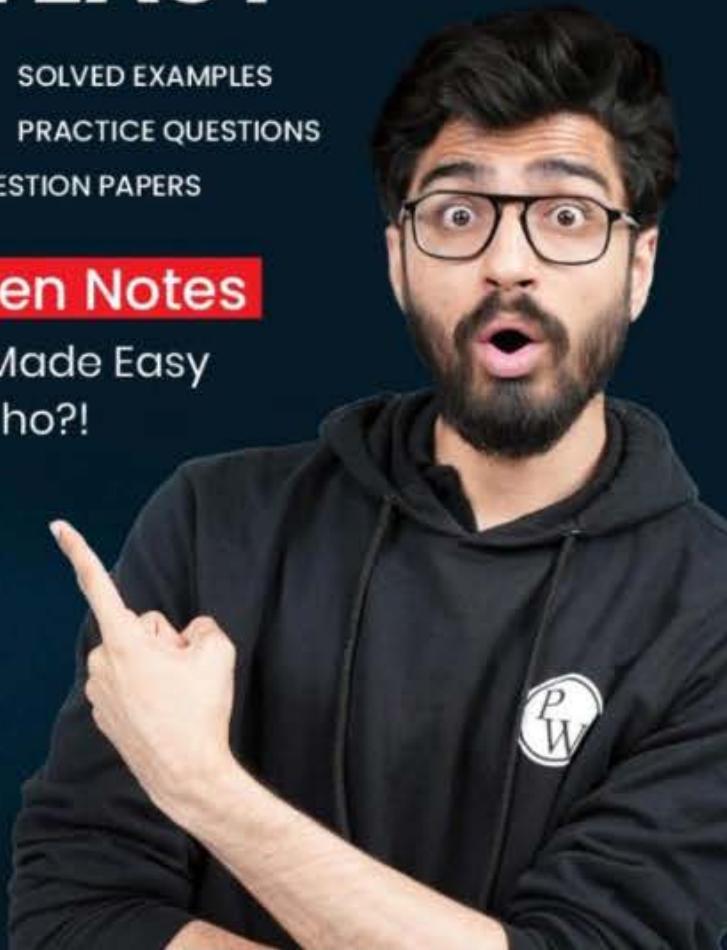
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Ritik Mishra



**WORK HARD
DREAM BIG
NEVER GIVE UP**





Thank
You