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Subject: - Mathematics

Solution of a Pair of Linear Equations in Two Variables

Q. Find the value of K for which the given system of equations has a unique solution.

$$\begin{aligned}x - 2y &= 3 \\ 3x + ky &= 1\end{aligned}$$

Solⁿ For a unique solution, we must have

$$\begin{aligned}\frac{a_1}{a_2} &\neq \frac{b_1}{b_2} \\ \therefore \frac{1}{3} &\neq \frac{-2}{K} \\ \Rightarrow K &\neq -6\end{aligned}$$

Hence, the given system of equations will have a unique solution for all real values of K , other than -6 .

Do your self

Find the value of K for which the given system of equations has a unique solution.

$$\begin{aligned}(1) \quad 2x + 3y - 5 &= 0 & (2) \quad x - ky &= 2 & (3) \quad 4x + ky &= -8 \\ Kx - 6y - 8 &= 0 & 3x + 2y &= -5 & x + y &= -1\end{aligned}$$

Q. Find the values of K for which the pair of linear equations has no solution.

$$\begin{aligned}Kx + 3y &= K - 2 \\ 12x + ky &= K\end{aligned}$$

The given system of equations have no solution

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

$$\Rightarrow \frac{K}{12} = \frac{3}{K} \neq \frac{K-2}{K}$$

$$\Rightarrow \frac{K}{12} = \frac{3}{K} \text{ and } \frac{3}{K} \neq \frac{K-2}{K}$$

$$\Rightarrow K^2 = 36 \text{ and } K-2 \neq 3$$

$$\Rightarrow K = \pm 6 \text{ and } K \neq 5$$

When $K = -6$ and 6 then eqns has no solution.

Do your self

Show that the equations has no solution.

$$\begin{aligned}(1) \quad Kx + 2y &= 5 & (2) \quad x + 2y &= 5 & (3) \quad x + 2y &= 3 \\ 3x - 4y &= 10 & 3x + ky &= -15 & 5x + ky &= -7\end{aligned}$$