Pair of Linear Equations in Two varibles Ex 3.5 Q31

Answer :

GIVEN:

$x + 2y + 7 = 0$

$2x + ky + 14 = 0$

To find: To determine for what value of k the system of equation will represents coincident lines

We know that the system of equations

$a_1x + b_1y = c_1$

$a_2x + b_2y = c_2$

For the system of equation to represent coincident lines we have the following relation

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

Here,

$\dfrac{1}{2} = \dfrac{2}{k} = \dfrac{7}{14}$

$\dfrac{1}{2} = \dfrac{2}{k}$ and $\dfrac{2}{k} = \dfrac{7}{14}$

$k = 4$ and $k = 4$

Hence for $\boxed{k = 4}$ the system of equation represents coincident lines

Pair of Linear Equations in Two varibles Ex 3.5 Q32

Answer :

GIVEN:

$ax + by = c$

$lx + my = n$

To find: To determine the condition for the system of equation to have a unique equation

We know that the system of equations

$a_1x + b_1y = c_1$

$a_2x + b_2y = c_2$

For unique solution

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

Here

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

$am \neq bl$

Hence for $\boxed{am \neq bl}$ the system of equation have unique solution.

Pair of Linear Equations in Two varibles Ex 3.5 Q33

Answer :

GIVEN:

$(2a-1)x + 3y - 5 = 0$

$3x + (b-1)y - 2 = 0$

To find: To determine for what value of k the system of equation has infinitely many solutions

We know that the system of equations

$a_1 x + b_1 y = c_1$

$a_2 x + b_2 y = c_2$

For infinitely many solution

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

Here

$\dfrac{(2a-1)}{3} = \dfrac{3}{(b-1)} = \dfrac{5}{2}$

$\dfrac{3}{(b-1)} = \dfrac{5}{2}$

$6 = 5(b-1)$

$6 = 5b - 5$

$b = \dfrac{11}{5}$

Again consider

$\dfrac{(2a-1)}{3} = \dfrac{3}{(b-1)}$

$(2a-1)(b-1) = 9$

$(2a-1)\left(\dfrac{11}{5} - 1\right) = 9$ [subsituting the value of b]

$(2a-1)\left(\dfrac{11-5}{5}\right) = 9$

$(2a-1)\left(\dfrac{6}{5}\right) = 9$

$(2a-1) = 9\left(\dfrac{5}{6}\right)$

$(2a-1) = \left(\dfrac{15}{2}\right)$

$2a = \dfrac{15}{2} + 1$

$2a = \dfrac{15+2}{2}$

$2a = \dfrac{17}{2}$

$a = \dfrac{17}{4}$

Hence for $\boxed{a = \dfrac{17}{4}}$ and $\boxed{b = \dfrac{11}{5}}$ the system of equation has infinitely many solution.

********** END *********