



Pair of Linear Equations in Two variables Ex 3.5 Q27

Answer :

GIVEN:

$$\alpha x + 3y = \alpha - 3$$

$$12x + \alpha y = \alpha$$

To find: To determine for what value of k the system of equation has no solution

We know that the system of equations

$$a_1x + b_1y = c_1$$

$$a_2x + b_2y = c_2$$

For no solution

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

Here,

$$\frac{\alpha}{12} = \frac{3}{\alpha} \neq \frac{\alpha-3}{\alpha}$$

Consider the following for α

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

$$\alpha^2 = 12 \times 3$$

$$\alpha^2 = 36$$

$$\alpha = \pm 6$$

Now consider the following

$$\frac{3}{\alpha} \neq \frac{\alpha-3}{\alpha}$$

$$3\alpha \neq \alpha(\alpha - 3)$$

$$3\alpha \neq \alpha^2 - 3\alpha$$

$$6\alpha \neq \alpha^2$$

$$\alpha \neq 6$$

Hence the common value of α is -6

Hence for $\alpha = -6$ the system of equation has no solution

Pair of Linear Equations in Two variables Ex 3.5 Q28

Answer :

GIVEN:

$$kx + 2y = 5$$

$$3x + y = 1$$

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

(1) Unique solution

(2) No solution

We know that the system of equations

$$a_1x + b_1y = c_1$$

$$a_2x + b_2y = c_2$$

(1) For Unique solution

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

Here,

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

$$k \neq 6$$

Hence for $k \neq 6$ the system of equation has unique solution.

(2) For no solution

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

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

$$k = 6$$

Hence for $k = 6$ the system of equation has no solution

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