



Pair of Linear Equations in Two variables Ex 3.5 Q19

Answer :

GIVEN:

$$2x + 3y = k$$

$$(k-1)x + (k+2)y = 3k$$

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

We know that the system of equations

$$a_1x + b_1y = c_1$$

$$a_2x + b_2y = c_2$$

For infinitely many solution

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

Here,

$$\frac{2}{(k-1)} = \frac{3}{(k+2)} = \frac{k}{3k}$$

Consider the following to find out k

$$\frac{2}{(k-1)} = \frac{3}{(k+2)}$$

$$2(k+2) = 3(k-1)$$

$$2k + 4 = 3k - 3$$

$$3k - 2k = 4 + 3$$

$$k = 7$$

Now again consider the following relation

$$\frac{3}{(k+2)} = \frac{k}{3k}$$

$$3(3k) = k(k+2)$$

$$9k = k^2 + 2k$$

$$k^2 - 7k = 0$$

$$k(k-7) = 0$$

$$k = 0 \text{ or } (k-7)$$

So the common solution is 7

Hence for $k = 7$ the system of equation have infinitely many solutions

Pair of Linear Equations in Two variables Ex 3.5 Q20

Answer :

GIVEN:

$$kx - 5y = 2$$

$$6x + 2y = 7$$

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,

$$\frac{k}{6} = \frac{-5}{2} \neq \frac{2}{7}$$

$$\frac{k}{6} = \frac{-5}{2}$$

$$2k = -30$$

$$k = -15$$

Hence for $k = -15$ the system of equation have infinitely many solutions.

Pair of Linear Equations in Two variables Ex 3.5 Q21

Answer :

GIVEN:

$$x + 2y = 0$$

$$2x + ky = 5$$

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,

$$\frac{1}{2} = \frac{2}{k} \neq \frac{0}{5}$$

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

$$k = 4$$

Hence for $k = 4$ the system of equation has no solution

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