Pair of Linear Equations in Two varibles Ex 3.5 Q15

Answer :

GIVEN:

$$x+(k+1)y=4$$
$$(k+1)x+9y=5k+2$$

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,

$$\frac{1}{k+1}=\frac{(k+1)}{9}=\frac{4}{5k+2}$$
$$\frac{1}{k+1}=\frac{(k+1)}{9}$$
$$9=(k+1)^2$$
$$3^2=(k+1)^2$$
$$k+1=3$$
$$k=2$$

Hence for $\boxed{k=2}$ the system of equation have infinitely many solutions.

Pair of Linear Equations in Two varibles Ex 3.5 Q16

Answer :

GIVEN:

$$kx+3y=2k+1$$
$$2(k+1)x+9y=7k+1$$

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,

$$\frac{k}{2(k+1)}=\frac{3}{9}=\frac{2k+1}{7k+1}$$

Consider the following relation to find k

$$\frac{k}{2(k+1)}=\frac{3}{9}$$
$$9k=6(k+1)$$
$$9k-6k-6=0$$
$$3k=6$$
$$k=2$$

Now consider the following

$$\frac{3}{9}=\frac{2k+1}{7k+1}$$
$$3(7k+1)=9(2k+1)$$
$$21k+3=18k+9$$
$$21k-18k=9-3$$
$$3k=6$$
$$k=2$$

Hence for $\boxed{k=2}$ the system of equation have infinitely many solutions

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