

Pair of Linear Equations in Two varibles Ex 3.5 Q36 Answer:

(i) GIVEN:

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

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

To find: To determine for what value of k the system of equation has infinitely many solutions. We know that the system of equations

$$a_1 x + b_1 y = c_1$$

$$a_2x + b_2y = c_2$$

For infinitely many solution

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

Here

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

Consider

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

$$-5b+10=9$$

$$-5b = -1$$

$$b = \frac{1}{5}$$

Again consider

$$\frac{2a-1}{3} = \frac{5}{3}$$

$$2a-1=5$$

$$2a = 6$$

$$a = 3$$

Hence for a=3 and $b=\frac{1}{5}$ the system of equation has infinitely many solution.

(ii) GIVEN:

$$2x - (2a + 5)y = 5$$

$$(2b+1)x-9y=15$$

To find: To determine for what value of k the system of equation has infinitely many solutions. We know that the system of equations

$$a_1 x + b_1 y = c_1$$

$$a_2x + b_2y = c_2$$

For infinitely many solution

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

Here

$$\frac{2}{2b+1} = \frac{2a+5}{9} = \frac{5}{15}$$

Consider the following

$$\frac{2a+5}{9} = \frac{5}{15}$$
$$30a+75 = 45$$
$$30a = -30$$
$$a = -1$$

Again consider

$$\frac{2}{2b+1} = \frac{5}{15}$$

10b + 5 = 30

$$10b = 25$$

$$b = \frac{5}{2}$$

Hence for a = -1 and $b = \frac{5}{2}$ the system of equation has infinitely many solution.

(iii) GIVEN:

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

$$6x + (1-2b)y = 6$$

To find: To determine for what value of k the system of equation has infinitely many solutions. We know that the system of equations

$$a_1 x + b_1 y = c_1$$

$$a_2x + b_2y = c_2$$

For infinitely many solution

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

Here

$$\frac{(a-1)}{6} = \frac{3}{(1-2b)} = \frac{2}{6}$$

Consider the following

$$\frac{3}{\left(1-2b\right)} = \frac{2}{6}$$

$$2 - 4b = 18$$

$$-4b = 16$$

$$b = -4$$

Again consider

$$\frac{\left(a-1\right)}{6} = \frac{2}{6}$$

$$6a - 6 = 12$$

$$6a = 18$$

$$a = 3$$

Hence for a = 3 and b = -4 the system of equation has infinitely many solution.

(iv) GIVEN:

$$3x + 4y = 12$$

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

To find: To determine for what value of k the system of equation has infinitely many solutions. We know that the system of equations

$$a_1 x + b_1 y = c_1$$

$$a_2x + b_2y = c_2$$

For infinitely many solution

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

Here

$$\frac{3}{(a+b)} = \frac{4}{2(a-b)} = \frac{12}{5a-1}$$

Consider the following

$$\frac{4}{2(a-b)} = \frac{12}{5a-1}$$

$$24a - 24b = 20a - 4$$

$$4a - 24b = -4 \dots (1)$$

Again consider

$$\frac{3}{\left(a+b\right)} = \frac{12}{5a-1}$$

$$12a+12b=15a-3$$

$$3a-12b=3$$
.....(2)