

Pair of Linear Equations in Two varibles Ex 3.5 Q17 Answer:

GIVEN:

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

$$6x + (2k - 1)y = 2k + 5$$

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

$$\frac{a_{1}}{a_{2}} = \frac{b_{1}}{b_{1}} = \frac{c_{1}}{c_{2}}$$

Here,

$$\frac{2}{6} = \frac{(k-2)}{(2k-1)} = \frac{k}{2k+5}$$

Consider the following relation to find k

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

$$2(2k-1)=6(k-2)$$

$$4k - 2 = 6k - 12$$

$$6k - 4k = 12 - 2$$

$$2k = 10$$

$$k = 5$$

Now again consider the following

$$\frac{\left(k-2\right)}{\left(2k-1\right)} = \frac{k}{2k+5}$$

$$(2k+5)(k-2)=k(2k-1)$$

$$2k^2 - 4k + 5k - 10 = 2k^2 - k$$

$$2k^2 - 4k + 5k - 10 = 2k^2 - k$$

$$2k = 10$$

$$k = 5$$

Hence for k=5 the system of equation have infinitely many solutions

Pair of Linear Equations in Two varibles Ex 3.5 Q18

Answer:

GIVEN:

$$2x+3y = 7$$

$$(k+1)x+(2k-1)y = 4k+1$$

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

$$\frac{2}{(k+1)} = \frac{3}{2(k-1)} = \frac{7}{4k+1}$$
$$\frac{2}{(k+1)} = \frac{3}{2(k-1)}$$

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

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

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

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

$$k = 5$$

Now again consider the following to find k

$$\frac{3}{2(k-1)} = \frac{7}{4k+1}$$

$$3(4k+1) = 7 \times 2(k-1)$$

$$12k + 3 = 14k - 14$$

$$14 + 3 = 14k - 12k$$

$$k = 5$$

Hence for k = 5 the system of equation have infinitely many solutions

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