



Pair of Linear Equations in Two variables Ex 3.5 Q13

**Answer :**

GIVEN:

$$2x - 3y = 7$$

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

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

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

Consider the following

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

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

$$4k+2 = 3k+6$$

$$4k-3k = 6-2$$

$$k = 4$$

Now consider the following

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

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

$$18k - 9 = 14k + 7$$

$$18k - 14k = 9 + 7$$

$$4k = 16$$

$$\Rightarrow k = 4$$

Hence for  $k = 4$  the system of equation have infinitely many solutions.

Pair of Linear Equations in Two variables Ex 3.5 Q14

**Answer :**

GIVEN:

$$2x + 3y = 2$$

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

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,

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

Consider the following for  $k$

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

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

$$4k + 2 = 3k + 6$$

$$4k - 3k = 6 - 2$$

$$\Rightarrow k = 4$$

Now consider the following

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

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

$$6k - 6 = 4k + 2$$

$$6k - 4k = 6 + 2$$

$$2k = 8$$

$$\Rightarrow k = 4$$

Hence for  $\boxed{k = 4}$  the system of equation have infinitely many solutions.

\*\*\*\*\* END \*\*\*\*\*