



Multiplying eq. (2) by 2 and subtracting eq. (1) from eq. 2

$$2a = 10$$

$$a = 5$$

Substituting the value of 'a' in eq. (2) we get

$$15 - 12b = 3$$

$$-12b = -12$$

$$b = 1$$

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

(v) GIVEN:

$$2x + 3y = 7$$

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

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

$$\frac{2}{(a-b)} = \frac{3}{(a+b)} = \frac{7}{3a+b-2}$$

Consider the following

$$\frac{3}{(a+b)} = \frac{7}{3a+b-2}$$

$$9a + 3b - 6 = 7a + 7b$$

$$2a - 4b = 6 \dots\dots (1)$$

Again consider the following

$$\frac{2}{(a-b)} = \frac{7}{3a+b-2}$$

$$6a + 2b - 4 = 7a - 7b$$

$$a - 9b = -4 \dots\dots (2)$$

Multiplying eq. (2) by 2 and subtracting eq. (1) from eq. (2)

$$-14b = -14$$

$$b = 1$$

Substituting the value of b in eq. (2) we get

$$a - 9 = -4$$

$$a = 5$$

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

(vi) GIVEN:

$$2x + 3y - 7 = 0$$

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

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

Rewrite the given equations

$$2x + 3y - 7 = 0$$

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

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

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

Consider the following

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

$$9a-3 = 7a+7$$

$$2a = 10$$

$$a = 5$$

Hence for $\boxed{a=5}$ the system of equation have infinitely many solutions.

(vii) GIVEN :

$$2x + 3y = 7$$

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

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

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

Consider the following

$$\frac{3}{(a+2)} = \frac{7}{3a}$$

$$9a = 7a + 14$$

$$2a = 14$$

$$a = 7$$

Hence for $\boxed{a=7}$ the system of equation have infinitely many solutions.

***** END *****