Pair of Linear Equations in Two varibles Ex 3.4 Q12

$$\Rightarrow y = b$$

Hence we get the value of $\boxed{x = a}$ and $\boxed{y = b}$

Answer :

GIVEN:

$$\frac{5}{x+y} - \frac{2}{x-y} = -1$$

$$\frac{15}{x+y} + \frac{7}{x-y} = 10$$

To find: The solution of the systems of equation by the method of cross-multiplication:

Here we have the pair of simultaneous equation

Rewriting the equation again

$$\frac{5}{x+y} - \frac{2}{x-y} + 1 = 0$$

$$\frac{15}{x+y} + \frac{7}{x-y} - 10 = 0$$

Taking $u = \dfrac{1}{x+y}$ and $v = \dfrac{1}{x-y}$

$$5u - 2v + 1 = 0 \qquad ......(1)$$

$$15u + 7v - 10 = 0 \qquad ......(2)$$

By cross multiplication method we get

$$\frac{u}{(20)-(7)} = \frac{-v}{(-50)-(15)} = \frac{1}{(35)-(-30)}$$

$$\Rightarrow \frac{u}{13} = \frac{-v}{-65} = \frac{1}{65}$$

$$\Rightarrow \frac{u}{13} = \frac{v}{65} = \frac{1}{65}$$

$$\Rightarrow \frac{u}{13} = \frac{1}{65}$$

$$\Rightarrow u = \frac{1}{5}$$

And

$$\frac{v}{\quad} \qquad 1$$

$$\frac{}{65} = \frac{}{65}$$

$$v = 1$$

We know that

$$u = \frac{1}{x+y} \text{ and } v = \frac{1}{x-y}$$

$$\Rightarrow \frac{1}{5} = \frac{1}{x+y}$$

$$\Rightarrow x + y = 5 \qquad \text{.......(3)}$$

and

$$1 = \frac{1}{x-y}$$

$$\Rightarrow x - y = 1 \qquad \text{.......(4)}$$

Adding equation (3) and (4)

$$2x = 6$$

$$x = 3$$

Substituting value of x in equation (3) we get

$$y = 5 - 3$$

$$= 2$$

Hence we get the value of $\boxed{x = 3}$ and $\boxed{y = 2}$

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