Pair of Linear Equations in Two varibles Ex 3.4 Q13

Answer :

GIVEN:

$$\frac{2}{x} + \frac{3}{y} = 13$$

$$\frac{5}{x} - \frac{4}{y} = -2$$

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

$$\frac{2}{x} + \frac{3}{y} - 13 = 0$$

$$\frac{5}{x} - \frac{4}{y} + 2 = 0$$

Taking $u = \frac{1}{x}$ and $v = \frac{1}{y}$

$$2u + 3v - 13 = 0 \quad \ldots\ldots(1)$$

$$5u - 4v + 2 = 0 \quad \ldots\ldots(2)$$

By cross multiplication method we get from eq. (1) and eq. (2)

$$\frac{u}{(6)-(52)} = \frac{-v}{(4)-(-65)} = \frac{1}{(-8)-(15)}$$

$$\frac{u}{-46} = \frac{-v}{69} = \frac{1}{-23}$$

$$\Rightarrow \frac{u}{-46} = \frac{1}{-23}$$

$$\Rightarrow u = 2$$

And

$$\frac{-v}{69} = \frac{1}{-23}$$

$$-v = \frac{69}{-23}$$

$$\Rightarrow v = 3$$

We know that

Taking $u = \frac{1}{x}$ and $v = \frac{1}{y}$

$$2 = \frac{1}{x} \Rightarrow x = \frac{1}{2}$$

and

$$3 = \frac{1}{y} \Rightarrow y = \frac{1}{3}$$

Hence we get the value of $\boxed{x = \frac{1}{2}}$ and $\boxed{y = \frac{1}{3}}$

Pair of Linear Equations in Two varibles Ex 3.4 Q14

Answer :

GIVEN:

$$ax + by = \frac{a+b}{2}$$

$$3x + 5y = 4$$

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

Here we have the pair of simultaneous equation

$$ax + by - \frac{a+b}{2} = 0$$

$$3x + 5y - 4 = 0$$

By cross multiplication method we get

$$\frac{x}{(-4b) - \left(-\frac{5(a+b)}{2}\right)} = \frac{-y}{(-4a) - \left(-\frac{3(a+b)}{2}\right)} = \frac{1}{5a - 3b}$$

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

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

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

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

$$\Rightarrow x=\frac{1}{2}$$

And

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

$$\frac{-y}{\frac{-8a+3a+3b}{2}}=\frac{1}{5a-3b}$$

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

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

$$\Rightarrow y=\frac{1}{2}$$

Hence we get the value of $\boxed{x=\frac{1}{2}}$ and $\boxed{y=\frac{1}{2}}$

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