Pair of Linear Equations in Two varibles Ex 3.4 Q25

Answer :

GIVEN:

$$\frac{a^2}{x} - \frac{b^2}{y} = 0$$

$$\frac{a^2b}{x} + \frac{ab^2}{y} = a+b$$

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

Here we have the pair of simultaneous equation

$$\frac{a^2}{x} - \frac{b^2}{y} = 0$$

$$\frac{a^2b}{x} + \frac{ab^2}{y} - (a+b) = 0$$

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

Rewriting equations

$$a^2u - b^2v = 0 \ldots\ldots(1)$$

$$a^2bu + ab^2v - (a+b) = 0 \ldots\ldots(2)$$

Now, by cross multiplication method we get

$$\frac{u}{\left(-(a+b)\left(-b^2\right)\right)-(0)} = \frac{-v}{\left(-(a+b)\left(a^2\right)\right)-(0)} = \frac{1}{\left(a^3b^2\right)+\left(a^2b^3\right)}$$

$$\frac{u}{\left(ab^2+b^3\right)} = \frac{v}{\left(a^3+ba^2\right)} = \frac{1}{\left(a^3b^2+a^2b^3\right)}$$

For u consider the following

$$\frac{u}{\left(ab^2+b^3\right)}=\frac{1}{\left(a^3b^2+a^2b^3\right)}$$

$$\frac{u}{\left(a+b\right)}=\frac{1}{a^2\left(a+b\right)}$$

$$u=\frac{1}{a^2}$$

For y consider

$$\frac{v}{\left(a^3+ba^2\right)}=\frac{1}{\left(a^3b^2+a^2b^3\right)}$$

$$\frac{v}{\left(a+b\right)}=\frac{1}{b^2\left(a+b\right)}$$

$$v=\frac{1}{b^2}$$

We know that

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

Now

$$\frac{1}{x}=\frac{1}{a^2} \text{ and } \frac{1}{b^2}=\frac{1}{y}$$

$$x=a^2 \text{ and } y=b^2$$

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

Pair of Linear Equations in Two varibles Ex 3.4 Q26

Answer :

GIVEN:

$$mx - ny = m^2+n^2$$
$$x + y = 2m$$

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

Here we have the pair of simultaneous equation

$$mx - ny-\left(m^2+n^2\right)=0$$
$$x + y-2m=0$$

By cross multiplication method we get

$$\frac{x}{(-2m)(-n)-\left(-\left(m^2+n^2\right)\right)}=\frac{-y}{(-2m)(m)-\left(-\left(m^2+n^2\right)\right)}=\frac{1}{m+n}$$

$$\frac{x}{(m+n)^2}=\frac{-y}{\left(-2m^2\right)+\left(m^2+n^2\right)}=\frac{1}{m+n}$$

$$\frac{x}{(m+n)^2}=\frac{1}{m+n}$$

$$x=m+n$$

Now for y

$$\frac{-y}{\left(-2m^2\right)+\left(m^2+n^2\right)}=\frac{1}{m+n}$$

$$\frac{y}{\left(m^2-n^2\right)}=\frac{1}{m+n}$$

$$\frac{y}{(m-n)(m+n)}=\frac{1}{m+n}$$

$$y=m-n$$

Hence we get the value of $\boxed{x=m+n}$ and $\boxed{y=m-n}$

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