Pair of Linear Equations in Two varibles Ex 3.4 Q10

Answer :

GIVEN:

$$\frac{x}{a}+\frac{y}{b}=a+b$$

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

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

Here we have the pair of simultaneous equation

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

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

By cross multiplication method we get

$$\frac{x}{\left(\left(\frac{1}{b}\times(-2)\right)\right)-\left(\left(\frac{1}{b^2}\times(-(a+b))\right)\right)}=\frac{-y}{\left(\left(\frac{1}{a}\times(-2)\right)\right)-\left(\left(\frac{1}{a^2}\times(-(a+b))\right)\right)}=\frac{1}{\left(\frac{1}{a}\times\frac{1}{b^2}\right)-\left(\frac{1}{b}\times\frac{1}{a^2}\right)}$$

$$\frac{x}{\frac{-2}{b}+\frac{a+b}{b^2}}=\frac{-y}{\left(\frac{-2}{a}\right)+\frac{a+b}{a^2}}=\frac{1}{\left(\frac{1}{ab^2}\right)-\left(\frac{1}{a^2b}\right)}$$

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

$$\Rightarrow \frac{x}{\frac{a-b}{b^2}}=\frac{1}{\left(\frac{a-b}{a^2b^2}\right)}$$

$$\Rightarrow x=a^2$$

And

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

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

$$\Rightarrow \frac{y}{\frac{a-b}{a^2}}=\frac{1}{\left(\frac{a-b}{a^2b^2}\right)}$$

$$\Rightarrow y=b^2$$

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 Q11

Answer :

GIVEN:

$$\frac{x}{a}=\frac{y}{b}$$

$$ax + by = a^2+b^2$$

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

Here we have the pair of simultaneous equation

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

$$ax + by-\left(a^2+b^2\right)=0$$

By cross multiplication method we get

$$\frac{x}{\left(\left(-\frac{1}{b}\times-\left(a^2+b^2\right)\right)\right)-\left(0\times(-b)\right)}=\frac{-y}{\left(\left(\frac{1}{a}\times-\left(a^2+b^2\right)\right)\right)-\left(0\times(a)\right)}=\frac{1}{\left(\frac{1}{a}\times(b)\right)-\left(-\frac{1}{b}\times(a)\right)}$$

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

$$\frac{x}{\frac{\left(a^2+b^2\right)}{b}}=\frac{-y}{\left(\frac{-\left(a^2+b^2\right)}{a}\right)}=\frac{1}{\frac{a^2+b^2}{ab}}$$

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

$$\Rightarrow x = \frac{\frac{\left(a^2+b^2\right)}{b}}{\frac{a^2+b^2}{ab}}$$

$$\Rightarrow x = a$$

And

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

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

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

$$\Rightarrow y = \frac{\frac{\left(a^2+b^2\right)}{a}}{\frac{a^2+b^2}{ab}}$$

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