



Pair of Linear Equations in Two variables 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

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

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

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

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

$$\Rightarrow x = a^2$$

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 variables 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

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

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

By cross multiplication method we get

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

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

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

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

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

$$\Rightarrow x = a$$

And

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

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

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

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

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