



Pair of Linear Equations in Two variables Ex 3.4 Q5

Answer :

GIVEN:

$$\frac{x+y}{xy} = 2$$

$$\frac{x-y}{xy} = 6$$

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

Here we have the pair of simultaneous equation

$$\frac{x+y}{xy} = 2$$

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

$$\frac{1}{x} + \frac{1}{y} - 2 = 0 \quad \dots\dots(1)$$

$$\frac{x-y}{xy} = 6$$

$$\frac{1}{y} - \frac{1}{x} = 6$$

$$\frac{1}{y} - \frac{1}{x} - 6 = 0 \quad \dots\dots(2)$$

Let

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

Pair of Linear Equations in Two variables Ex 3.4 Q6

$$u + v - 2 = 0 \quad \dots\dots(3)$$

$$-u + v - 6 = 0 \quad \dots\dots(4)$$

By cross multiplication method we get

$$\frac{u}{((1) \times (-6)) - ((1) \times (-2))} = \frac{-v}{(1 \times (-6)) - ((-1) \times (-2))} = \frac{1}{(1 \times (1)) - (-1 \times (1))}$$

$$\frac{u}{-6+2} = \frac{-v}{-6-2} = \frac{1}{2}$$

$$\frac{u}{-4} = \frac{-v}{-8} = \frac{1}{2}$$

$$\frac{u}{4} = \frac{v}{8} = \frac{1}{2}$$

$$u = -2$$

$$\text{So } \frac{v}{8} = \frac{1}{2}$$

$$v = 4$$

We know that

$$-2 = \frac{1}{x} \text{ and } \frac{1}{y} = 4$$

$$\Rightarrow x = -\frac{1}{2} \text{ and } y = \frac{1}{4}$$

Hence we get the value of $x = -\frac{1}{2}$ and $y = \frac{1}{4}$

">

Answer :

GIVEN:

$$ax + by = a - b$$

$$bx - ay = a + b$$

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

Here we have the pair of simultaneous equation

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

$$bx - ay - (a + b) = 0$$

By cross multiplication method we get

$$\begin{aligned} \frac{x}{((b) \times (- (a + b))) - ((-a) \times (- (a - b)))} &= \frac{-y}{(a \times (- (a + b))) - (b \times (- (a - b)))} = \frac{1}{-a^2 - b^2} \\ \frac{x}{(-ab - b^2) - (a^2 - ab)} &= \frac{-y}{(-a^2 - ab) - (-ab + b^2)} = \frac{1}{(-a^2 - b^2)} \\ \frac{x}{(-a^2 - b^2 - ab + ab)} &= \frac{-y}{(-a^2 - b^2 - ab + ab)} = \frac{1}{(-a^2 - b^2)} \\ \frac{x}{(-a^2 - b^2)} &= \frac{-y}{(-a^2 - b^2)} = \frac{1}{(-a^2 - b^2)} \end{aligned} \quad T$$

Therefore $x = 1$ and $y = -1$

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

Pair of Linear Equations in Two variables Ex 3.4 Q7

Answer :

GIVEN:

$$x + ay = b$$

$$ax - by = c$$

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

Here we have the pair of simultaneous equation

$$x + ay - b = 0$$

$$ax - by - c = 0$$

By cross multiplication method we get

$$\begin{aligned} \frac{x}{((a \times (-c)) - ((-b) \times (-b)))} &= \frac{-y}{(1 \times (-c)) - (a \times (-b))} = \frac{1}{(1 \times (-b)) - (a \times a)} \\ \frac{x}{(-ac - b^2)} &= \frac{-y}{(-c + ab)} = \frac{1}{(-b - a^2)} \\ x &= \frac{(-ac - b^2)}{(-b - a^2)} \\ x &= \frac{(ac + b^2)}{(b + a^2)}, \text{ and } y = \frac{-(-c + ab)}{(-b - a^2)} = \frac{(ab - c)}{(a^2 + b)} \end{aligned}$$

Hence we get the value of $\boxed{x = \frac{(ac + b^2)}{(b + a^2)}}$ and $\boxed{y = \frac{(ab - c)}{(a^2 + b)}}$

***** END *****