Pair of Linear Equations in Two varibles 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

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

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

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

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

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

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

Let

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

Pair of Linear Equations in Two varibles Ex 3.4 Q6

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

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

By cross multiplication method we get

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

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

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

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

$$u=-2$$

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

$v=4$

We know that

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

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

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

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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

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

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

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

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

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 varibles 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

$$\frac{x}{((a\times(-c)))-((-b)\times(-b))}=\frac{-y}{(1\times(-c))-(a\times(-b))}=\frac{1}{(1\times(-b))-(a\times a)}$$

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

$$x=\frac{(-ac-b^2)}{(-b-a^2)}$$

$x=\dfrac{(ac+b^2)}{(b+a^2)}$, and $y=\dfrac{-(-c+ab)}{(-b-a^2)}$ $y=\dfrac{(ab-c)}{(a^2+b)}$

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

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