Pair of Linear Equations in Two varibles Ex 3.4 Q23

Answer :

GIVEN:

$$2(ax - by) + a + 4b = 0$$
$$2(bx + ay) + b - 4a = 0$$

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

Here we have the pair of simultaneous equation

$$2(ax - by) + a + 4b = 0$$
$$2(bx + ay) + b - 4a = 0$$

After rewriting equations

$$2ax - 2by + (a + 4b) = 0$$
$$2bx + 2ay + (b - 4a) = 0$$

By cross multiplication method we get

$$\frac{x}{(b-4a)(-2b)-(a+4b)(2a)} = \frac{-y}{(b-4a)(2a)-(a+4b)(2b)} = \frac{1}{4a^2+4b^2}$$

$$\frac{x}{(-2b^2+8ab)-(2a^2+8ab)} = \frac{-y}{(2ab-8a^2)-(2ba+8b^2)} = \frac{1}{4a^2+4b^2}$$

$$\frac{x}{-2(b^2+a^2)} = \frac{y}{8(a^2+b^2)} = \frac{1}{4a^2+4b^2}$$

$$\frac{x}{-2(b^2+a^2)} = \frac{y}{8(a^2+b^2)} = \frac{1}{4a^2+4b^2}$$

$$\frac{x}{-2(b^2+a^2)} = \frac{1}{4a^2+4b^2}$$

$$\Rightarrow x = \frac{-1}{2}$$

For y consider the following

$$\frac{x}{-2(b^2+a^2)} = \frac{y}{8(a^2+b^2)} = \frac{1}{4a^2+4b^2}$$

$$\frac{y}{8(a^2+b^2)} = \frac{1}{4a^2+4b^2}$$

$$\Rightarrow y = 2$$

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

Pair of Linear Equations in Two varibles Ex 3.4 Q24

Answer :

GIVEN:

$6(ax+by)=3a+2b$

$6(bx-ay)=3b-2a$

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

Here we have the pair of simultaneous equation, after rewriting equations

$6ax+6by-(3a+2b)=0$

$6bx-6ay-(3b-2a)=0$

By cross multiplication method we get

$$\frac{x}{-(3b-2a)(6b)-((-6a)\times-(3a+2b))}=\frac{-y}{-(3b-2a)(6a)-((6b)\times-(3a+2b))}=\frac{1}{-36(a^2+b^2)}$$

$$\frac{x}{-18(b^2+a^2)}=\frac{-y}{12(a^2+b^2)}=\frac{1}{-36(a^2+b^2)}$$

$$\frac{x}{-18(b^2+a^2)}=\frac{1}{-36(a^2+b^2)}$$

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

Consider the following for y

$$\frac{x}{-18(b^2+a^2)}=\frac{-y}{12(a^2+b^2)}=\frac{1}{-36(a^2+b^2)}$$

$$\frac{-y}{12(a^2+b^2)}=\frac{1}{-36(a^2+b^2)}$$

$$y=\frac{1}{3}$$

Hence we get the value of $\boxed{x=\frac{1}{2}}$ and $\boxed{y=\frac{1}{3}}$

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