



Pair of Linear Equations in Two variables 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 $x = -\frac{1}{2}$ and $y = 2$

Pair of Linear Equations in Two variables 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 $x = \frac{1}{2}$ and $y = \frac{1}{3}$

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