Pair of Linear Equations in Two varibles Ex 3.3 Q26

**Answer :**

The given equations are:

$$\frac{5}{x+y} - \frac{2}{x-y} = -1$$

$$\frac{15}{x+y} + \frac{7}{x-y} = 10$$

Let $\dfrac{1}{x+y} = u$ and $\dfrac{1}{x-y} = v$ then equations are

$$5u - 2v = -1 \quad \cdots \; (i)$$

$$15u + 7v = 10 \quad \cdots \; (ii)$$

Multiply equation $(i)$ by $7$ and equation $(ii)$ by $2$ and add both equations, we get

$$35u - 14v = -7$$

$$\underline{30u + 14v = 20}$$

$$65u = 13$$

$$\Rightarrow u = \frac{1}{5}$$

Put the value of $u$ in equation $(i)$, we get

$$5 \times \frac{1}{5} - 2v = -1$$

$$\Rightarrow -2v = -2$$

$$\Rightarrow v = 1$$

Then

$$\frac{1}{x+y} = \frac{1}{5}$$

$$\Rightarrow x + y = 5$$

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

$$\Rightarrow x - y = 1$$

Add both equations, we get

$$x + y = 5$$
$$\underline{x - y = 1}$$
$$2x = 6$$

$$\Rightarrow x = 3$$

Put the value of $x$ in first equation, we get

$$3 + y = 5$$

$$\Rightarrow y = 2$$

$$\Rightarrow y = 2$$

Hence the value of $\boxed{x = 3}$ and $\boxed{y = 2}$.

Pair of Linear Equations in Two varibles Ex 3.3 Q27

**Answer :**

The given equations are:

$$\frac{3}{x+y} + \frac{2}{x-y} = 2$$

$$\frac{9}{x+y} - \frac{4}{x-y} = 1$$

Let $\dfrac{1}{x+y} = u$ and $\dfrac{1}{x-y} = v$ then equations are

$$3u + 2v = 2 \quad \cdots (i)$$

$$9u - 4v = 1 \quad \cdots (ii)$$

Multiply equation $(i)$ by 2 and add both equations, we get

$$6u + 4v = 4$$

$$\underline{9u - 4v = 1}$$

$$15u = 5$$

$$\Rightarrow u = \frac{1}{3}$$

Put the value of $u$ in equation $(i)$, we get

$$3 \times \frac{1}{3} + 2v = 2$$

$$\Rightarrow 2v = 1$$

$$\Rightarrow v = \frac{1}{2}$$

Then

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

$$\Rightarrow x + y = 3$$

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

$$\Rightarrow x - y = 2$$

Add both equations, we get

$$x + y = 3$$

$$\underline{x - y = 2}$$

$$2x = 5$$

$$\Rightarrow x = \frac{5}{2}$$

Put the value of $x$ in first equation, we get

$$\frac{5}{2} + y = 3$$

$$\Rightarrow y = \frac{1}{2}$$

Hence the value of $\boxed{x = \frac{5}{2}}$ and $\boxed{y = \frac{1}{2}}$.

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