Pair of Linear Equations in Two varibles Ex 3.3 Q23

Answer :

The given equations are:

$$\frac{6}{x+y}=\frac{7}{x-y}+3$$

$$\frac{1}{2(x+y)}=\frac{1}{3(x-y)}$$

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

$6u=7v+3 \ldots (i)$

$\frac{u}{2}=\frac{v}{3} \ldots (ii)$

Multiply equation (ii) by 12 and subtract (ii) from (i), we get

$$\begin{array}{l} 6u=7v+3 \\ \underline{6u=4v} \\ 0=3v+3 \end{array}$$

$\Rightarrow v=-1$

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

$\Rightarrow 6u=7\times -1+3$

$\Rightarrow 6u=-4$

$\Rightarrow u=-\frac{2}{3}$

Then

$$\frac{1}{x+y}=-\frac{2}{3}$$

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

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

$$\Rightarrow x-y=-1$$

Add both equations, we get

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

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

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

$$\Rightarrow x=-\frac{5}{4}$$

Put the value of x in second equation, we get

$$6\times 2+6y=5\times 2y$$

$$\Rightarrow 12=4y$$

$$\Rightarrow y=3$$

Hence the value of $\boxed{x=-\frac{5}{4}}$ and $\boxed{y=-\frac{1}{4}}$.

Pair of Linear Equations in Two varibles Ex 3.3 Q24

Answer :

The given equations are:

$$\frac{xy}{x+y}=\frac{6}{5}$$

$$6x+6y=5xy \quad ...(i)$$

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

$$6y-6x=xy \quad ...(ii)$$

Add both equations, we get

$$6x+6y=5xy$$

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

$$12y=6xy$$

$$\Rightarrow x=2$$

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

$$22\times-\frac{1}{11}+15v=5$$

$$\Rightarrow 15v=3$$

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

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

Answer :

The given equations are:

$$\frac{22}{x+y}+\frac{15}{x-y}=5$$

$$\frac{55}{x+y}+\frac{45}{x-y}=14$$

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

$22u+15v=5 \ldots (i)$

$55u+45v=14 \ldots (ii)$

Multiply equation (i) by 3 and subtracting (ii) from (i), we get

$$66u+45v=15$$

$$\underline{55u+45v=14}$$

$$11u=1$$

$$\Rightarrow u=\frac{1}{11}$$

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

$$22\times-\frac{1}{11}+15v=5$$

$$\Rightarrow 15v=3$$

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

Then

$$\frac{1}{x+y}=\frac{1}{11}$$

$$\Rightarrow x+y=11$$

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

$$\Rightarrow x-y=5$$

Add both equations, we get

$$x+y=11$$

$$\underline{x-y=5}$$

$$2x=16$$

$$\Rightarrow x=8$$

Put the value of x in second equation, we get

$$8-y=5$$

$$\Rightarrow -y=-3$$

$$\Rightarrow y=3$$

Hence the value of $\boxed{x=8}$ and $\boxed{y=3}$.

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