Pair of Linear Equations in Two varibles Ex 3.8 Q3

Answer :

Let the numerator and denominator of the fraction be x and y respectively. Then the fraction is $\frac{x}{y}$

If 1 is subtracted from both numerator and the denominator, the fraction becomes $\frac{1}{3}$. Thus, we have

$$\frac{x-1}{y-1}=\frac{1}{3}$$
$$\Rightarrow 3(x-1)=y-1$$
$$\Rightarrow 3x-3=y-1$$
$$\Rightarrow 3x-y-2=0$$

If 1 is added to both numerator and the denominator, the fraction becomes $\frac{1}{2}$. Thus, we have

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

So, we have two equations

$$3x-y-2=0$$
$$2x-y+1=0$$

Here x and y are unknowns. We have to solve the above equations for x and y.

By using cross-multiplication, we have

$$\frac{x}{(-1)\times 1-(-1)\times(-2)}=\frac{-y}{3\times 1-2\times(-2)}=\frac{1}{3\times(-1)-2\times(-1)}$$
$$\Rightarrow \frac{x}{-1-2}=\frac{-y}{3+4}=\frac{1}{-3+2}$$
$$\Rightarrow \frac{x}{-3}=\frac{-y}{7}=\frac{1}{-1}$$
$$\Rightarrow \frac{x}{3}=\frac{y}{7}=1$$
$$\Rightarrow x=3, y=7$$

Hence, the fraction is $\boxed{\frac{3}{7}}$.

Pair of Linear Equations in Two varibles Ex 3.8 Q4

Answer :

Let the numerator and denominator of the fraction be x and y respectively. Then the fraction is $\frac{x}{y}$

If 1 is added to the numerator and 1 is subtracted from the denominator, the fraction becomes 1. Thus, we have

$$\frac{x+1}{y-1}=1$$
$$\Rightarrow x+1=y-1$$
$$\Rightarrow x+1-y+1=0$$
$$\Rightarrow x-y+2=0$$

If 1 is added to the denominator, the fraction becomes $\frac{1}{2}$. Thus, we have

$$\frac{x}{y+1}=\frac{1}{2}$$
$$\Rightarrow 2x=y+1$$
$$\Rightarrow 2x-y-1=0$$

So, we have two equations

$$x-y+2=0$$
$$2x-y-1=0$$

Here x and y are unknowns. We have to solve the above equations for x and y.

By using cross-multiplication, we have

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

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

$$\Rightarrow \frac{x}{3}=\frac{-y}{-5}=\frac{1}{1}$$

$$\Rightarrow \frac{x}{3}=\frac{y}{5}=1$$

$$\Rightarrow x=3, y=5$$

Hence, the fraction is $\boxed{\frac{3}{5}}$.

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