Pair of Linear Equations in Two varibles Ex 3.8 Q9

Answer :

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

The sum of the numerator and denominator of the fraction is 4 more than twice the numerator. Thus, we have

$x + y = 2x + 4$

$\Rightarrow 2x + 4 - x - y = 0$

$\Rightarrow x - y + 4 = 0$

If the numerator and denominator are increased by 3, they are in the ratio 2:3. Thus, we have

$x + 3 : y + 3 = 2 : 3$

$\Rightarrow \dfrac{x+3}{y+3} = \dfrac{2}{3}$

$\Rightarrow 3(x+3) = 2(y+3)$

$\Rightarrow 3x + 9 = 2y + 6$

$\Rightarrow 3x - 2y + 3 = 0$

So, we have two equations

$x - y + 4 = 0$

$3x - 2y + 3 = 0$

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

By using cross-multiplication, we have

$$\dfrac{x}{(-1)\times 3 - (-2)\times 4} = \dfrac{-y}{1\times 3 - 3\times 4} = \dfrac{1}{1\times(-2) - 3\times(-1)}$$

$$\Rightarrow \dfrac{x}{-3+8} = \dfrac{-y}{3-12} = \dfrac{1}{-2+3}$$

$$\Rightarrow \dfrac{x}{5} = \dfrac{-y}{-9} = \dfrac{1}{1}$$

$$\Rightarrow \dfrac{x}{5} = \dfrac{y}{9} = 1$$

$$\Rightarrow x = 5, y = 9$$

Hence, the fraction is $\boxed{\dfrac{5}{9}}$.

Pair of Linear Equations in Two varibles Ex 3.8 Q10

Answer :

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

The sum of the numerator and denominator of the fraction is 3 less than twice the denominator.
Thus, we have

$x + y = 2y - 3$

$\Rightarrow x + y - 2y + 3 = 0$

$\Rightarrow x - y + 3 = 0$

If the numerator and denominator are decreased by 1, the numerator becomes half the denominator.
Thus, we have

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

$\Rightarrow \dfrac{x-1}{y-1} = \dfrac{1}{2}$

$\Rightarrow 2(x - 1) = y - 1$

$\Rightarrow 2x - 2 = y - 1$

$\Rightarrow 2x - y - 1 = 0$

So, we have two equations

$x - y + 3 = 0$

$2x - y - 5 = 0$

Here x and y are unknowns. We have to solve the above equations for x and y.
By using cross-multiplication, we have

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

$$\Rightarrow \frac{x}{1+3}=\frac{-y}{-1-6}=\frac{1}{-1+2}$$

$$\Rightarrow \frac{x}{4}=\frac{-y}{-7}=\frac{1}{1}$$

$$\Rightarrow \frac{x}{4}=\frac{y}{7}=1$$

$$\Rightarrow x=4,\ y=7$$

Hence, the fraction is $\boxed{\dfrac{4}{7}}$.

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

Here x and y are unknowns. We have to solve the above equations for x and y.
By using cross-multiplication, we have

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

$$\Rightarrow \frac{x}{1+3}=\frac{-y}{-1-6}=\frac{1}{-1+2}$$

$$\Rightarrow \frac{x}{4}=\frac{-y}{-7}=\frac{1}{1}$$

$$\Rightarrow \frac{x}{4}=\frac{y}{7}=1$$

$$\Rightarrow x=4,\ y=7$$