



Pair of Linear Equations in Two variables Ex 3.8 Q1

Answer :

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

The numerator of the fraction is 4 less the denominator. Thus, we have

$$x = y - 4$$

$$\Rightarrow x - y = -4$$

If the numerator is decreased by 2 and denominator is increased by 1, then the denominator is 8 times the numerator. Thus, we have

$$y + 1 = 8(x - 2)$$

$$\Rightarrow y + 1 = 8x - 16$$

$$\Rightarrow 8x - y = 1 + 16$$

$$\Rightarrow 8x - y = 17$$

So, we have two equations

$$x - y = -4$$

$$8x - y = 17$$

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

Subtracting the second equation from the first equation, we get

$$(x - y) - (8x - y) = -4 - 17$$

$$\Rightarrow x - y - 8x + y = -21$$

$$\Rightarrow -7x = -21$$

$$\Rightarrow 7x = 21$$

$$\Rightarrow x = \frac{21}{7}$$

$$\Rightarrow x = 3$$

Substituting the value of x in the first equation, we have

$$3 - y = -4$$

$$\Rightarrow y = 3 + 4$$

$$\Rightarrow y = 7$$

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

Pair of Linear Equations in Two variables Ex 3.8 Q2

Answer :

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

If 2 is added to both numerator and the denominator, the fraction becomes $\frac{9}{11}$. Thus, we have

$$\frac{x+2}{y+2} = \frac{9}{11}$$

$$\Rightarrow 11(x+2) = 9(y+2)$$

$$\Rightarrow 11x + 22 = 9y + 18$$

$$\Rightarrow 11x - 9y = 18 - 22$$

$$\Rightarrow 11x - 9y + 4 = 0$$

If 3 is added to both numerator and the denominator, the fraction becomes $\frac{5}{6}$. Thus, we have

$$\frac{x+3}{y+3} = \frac{5}{6}$$

$$\Rightarrow 6(x+3) = 5(y+3)$$

$$\Rightarrow 6x + 18 = 5y + 15$$

$$\Rightarrow 6x - 5y = 15 - 18$$

$$\Rightarrow 6x - 5y + 3 = 0$$

So, we have two equations

$$11x - 9y + 4 = 0$$

$$6x - 5y + 3 = 0$$

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

By using cross-multiplication, we have

$$\frac{x}{-9 \times 3 - (-5) \times 4} = \frac{-y}{11 \times 3 - 6 \times 4} = \frac{1}{11 \times (-5) - 6 \times (-9)}$$

$$\Rightarrow \frac{x}{-27 + 20} = \frac{-y}{33 - 24} = \frac{1}{-55 + 54}$$

$$\Rightarrow \frac{x}{-7} = \frac{-y}{9} = \frac{1}{-1}$$

$$\Rightarrow \frac{x}{7} = \frac{y}{9} = 1$$

$$\Rightarrow x = 7, y = 9$$

Hence, the fraction is $\boxed{\frac{7}{9}}$.

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