



### Pair of Linear Equations in Two variables Ex 3.8 Q5

**Answer :**

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

If the numerator is multiplied by 2 and the denominator is reduced by 5, the fraction becomes  $\frac{6}{5}$ .

Thus, we have

$$\frac{2x}{y-5} = \frac{6}{5}$$

$$\Rightarrow 10x = 6(y-5)$$

$$\Rightarrow 10x = 6y - 30$$

$$\Rightarrow 10x - 6y + 30 = 0$$

$$\Rightarrow 2(5x - 3y + 15) = 0$$

$$\Rightarrow 5x - 3y + 15 = 0$$

If the denominator is doubled and the numerator is increased by 8, the fraction becomes  $\frac{2}{5}$ . Thus, we

have

$$\frac{x+8}{2y} = \frac{2}{5}$$

$$\Rightarrow 5(x+8) = 4y$$

$$\Rightarrow 5x + 40 = 4y$$

$$\Rightarrow 5x - 4y + 40 = 0$$

So, we have two equations

$$5x - 3y + 15 = 0$$

$$5x - 4y + 40 = 0$$

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

By using cross-multiplication, we have

$$\frac{x}{(-3) \times 40 - (-4) \times 15} = \frac{-y}{5 \times 40 - 5 \times 15} = \frac{1}{5 \times (-4) - 5 \times (-3)}$$

$$\Rightarrow \frac{x}{-120 + 60} = \frac{-y}{200 - 75} = \frac{1}{-20 + 15}$$

$$\Rightarrow \frac{x}{-60} = \frac{-y}{125} = \frac{1}{-5}$$

$$\Rightarrow \frac{x}{60} = \frac{y}{125} = \frac{1}{5}$$

$$\Rightarrow x = \frac{60}{5}, y = \frac{125}{5}$$

$$\Rightarrow x = 12, y = 25$$

Hence, the fraction is  $\frac{12}{25}$ .

### Pair of Linear Equations in Two variables Ex 3.8 Q6

**Answer :**

Let the numerator and denominator of the fraction be  $x$  and  $y$  respectively. Then the fraction is  $\frac{x}{y}$ .  
If 3 is added to the denominator and 2 is subtracted from the numerator, the fraction becomes  $\frac{1}{4}$ .

Thus, we have

$$\frac{x-2}{y+3} = \frac{1}{4}$$

$$\Rightarrow 4(x-2) = y+3$$

$$\Rightarrow 4x-8 = y+3$$

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

If 6 is added to the numerator and the denominator is multiplied by 3, the fraction becomes  $\frac{2}{3}$ . Thus,

we have

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

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

$$\Rightarrow 3x+18 = 6y$$

$$\Rightarrow 3x-6y+18=0$$

$$\Rightarrow 3(x-2y+6)=0$$

$$\Rightarrow x-2y+6=0$$

So, we have two equations

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

$$x-2y+6=0$$

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

By using cross-multiplication, we have

$$\frac{x}{(-1) \times 6 - (-2) \times (-11)} = \frac{-y}{4 \times 6 - 1 \times (-11)} = \frac{1}{4 \times (-2) - 1 \times (-1)}$$

$$\Rightarrow \frac{x}{-6-22} = \frac{-y}{24+11} = \frac{1}{-8+1}$$

$$\Rightarrow \frac{x}{-28} = \frac{-y}{35} = \frac{1}{-7}$$

$$\Rightarrow \frac{x}{28} = \frac{y}{35} = \frac{1}{7}$$

$$\Rightarrow x = \frac{28}{7}, y = \frac{35}{7}$$

$$\Rightarrow x=4, y=5$$

Hence, the fraction is  $\boxed{\frac{4}{5}}$ .

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