



Exercise 3E

Question 24:

Let the numerator and denominator be x and y respectively.

Then the fraction is $\frac{x}{y}$.

$$\therefore \frac{x+2}{y} = \frac{1}{2} \Rightarrow 2x+4 = y \Rightarrow 2x-y = -4 \text{ --- (1)}$$

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

Subtracting (1) from (2), we get

$$x = 3$$

Putting $x = 3$ in (1), we get

$$2 \times 3 - 4$$

$$-y = -4 - 6$$

$$y = 10$$

$$x = 3 \text{ and } y = 10$$

Hence the fraction is $\frac{3}{10}$

Question 25:

Let the fraction be x/y .

When 2 is added to both the numerator and the denominator, the fraction becomes:

$$\frac{x+2}{y+2} = \frac{1}{3} \quad \text{or} \quad 3x+6 = y+2$$

$$3x - y = -4 \text{ --- (1)}$$

When 3 is added both to the numerator and the denominator, the fraction becomes:

$$\frac{x+3}{y+3} = \frac{2}{5} \quad \text{or} \quad 5x + 15 = 2y + 6$$

$$5x - 2y = -9 \quad \text{---(2)}$$

Multiplying (1) by 2 and (2) by 1, we get

$$6x - 2y = -8 \quad \text{---(3)}$$

$$5x - 2y = -9 \quad \text{---(4)}$$

Subtracting (4) from (3), we get

$$x = 1$$

Putting $x = 1$ in (1),

$$3 \times 1 - y = 4$$

$$y = 7$$

Question 26:

Let the two numbers be x and y respectively.

According to the given question:

$$x + y = 16 \quad \text{---(1)}$$

And

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

From (2),

$$\frac{x+y}{xy} = \frac{1}{3} \quad \text{or} \quad \frac{16}{xy} = \frac{1}{3} \quad [x+y=16]$$

$$xy = 48$$

We know,

$$\begin{aligned} (x-y)^2 &= (x+y)^2 - 4xy \\ &= 16^2 - 4 \times 48 = 256 - 192 = 64 \end{aligned}$$

$$\therefore x - y = 8 \quad \text{--- (3)}$$

Adding (1) and (3), we get

$$2x = 24$$

$$x = 12$$

Putting $x = 12$ in (1),

$$y = 16 - x$$

$$= 16 - 12$$

$$= 4$$

The required numbers are 12 and 4.

***** END *****

