



### Exercise 3E

Question 21:

Let numerator and denominator be  $x$  and  $y$  respectively.

Sum of numerator and denominator =  $x + y$

3 less than 2 times  $y = 2y - 3$

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

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

When 1 is decreased from numerator and denominator, the fraction becomes:

$$= \frac{x-1}{y-1} = \frac{1}{2}$$

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

$$\text{or } 2x - 2 = y - 1$$

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

Subtracting (1) from (2), we get

$$x = 1 + 3 = 4$$

Putting  $x = 4$  in (1), we get

$$y = x + 3$$

$$= 4 + 3$$

$$= 7$$

$$\text{the fraction is } \frac{x}{y} = \frac{4}{7}$$

Question 22:

Let the numerator and denominator be  $x$  and  $y$  respectively.

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

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

$$\text{and } \therefore \frac{x-7}{y-2} = \frac{1}{3} \Rightarrow 3x-21 = y-2 \Rightarrow 3x-y = 19 \text{ --- (2)}$$

Subtracting (1) from (2), we get

$$x = 15$$

Putting  $x = 15$  in (1), we get

$$2 \times 15 - y = 4$$

$$30 - y = 4$$

$$y = 26$$

$$x = 15 \text{ and } y = 26$$

Hence the given fraction is  $\frac{15}{26}$

Question 23:

Let the numerator and denominator be  $x$  and  $y$  respectively.

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

According to the given question:

$$y = x + 11$$

$$y - x = 11 \text{ --- (1)}$$

and

$$\frac{x+8}{y+8} = \frac{3}{4} \Rightarrow 4x+32 = 3y+24 \Rightarrow 4x-3y = -8$$

$$-3y + 4x = -8 \text{ --- (2)}$$

Multiplying (1) by 4 and (2) by 1

$$4y - 4x = 44 \text{ --- (3)}$$

$$-3y + 4x = -8 \text{ --- (4)}$$

Adding (3) and (4), we get

$$y = 36$$

Putting  $y = 36$  in (1), we get

$$y - x = 11$$

$$36 - x = 11$$

$$x = 25$$

$$x = 25, y = 36$$

Hence the fraction is  $\frac{25}{36}$

