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
or x - y = -3 ---(1)
When 1 is decreased from numerator and denominator, the fraction becomes:

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

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

or $2x - 2 = y - 1$

or $2x - y = 1$ —(2)

Subtracting (1) from (2), we get

$x = 1 + 3 = 4$

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

$y = x + 3$

$= 4 + 3$

$= 7$

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 $\frac{x}{y}$

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

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 × 15 − y = 4

30 − y = 4

y = 26

x = 15 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 —(1)

and

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

-3y + 4x = -8 —(2)

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

4y − 4x = 44 —(3)

-3y + 4x = -8 —(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 $\frac{25}{36}$

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