

Exercise 3E

Question 18:

Let the ten's and unit's digits of the required number be x and y respectively.

Then, xy = 18

Required number = 10x + y

Number obtained on reversing its digits = 10y + x

$$(10x + y) - 63 = (10y + x)$$

$$9x - 9y = 63$$

$$x - y = 7 ---(1)$$

Now.

$$(x+y)^2 - (x-y)^2 = 4xy$$

$$\Rightarrow (x + y) = \sqrt{(x - y)^2 + 4xy}$$

$$x + y = \sqrt{(7)^2 + 4x \cdot 18} = \sqrt{49 + 72} = \sqrt{121}$$

$$x + y = 11 - - - (2)$$

Adding (1) and (2), we get

2x = 18

x = 18/2 = 9

Putting x = 9 in (1), we get

$$9 - y = 7$$

y = 9 - 7

y = 2

x = 9, y = 2

Hence, the required number = $9 \times 10 + 2$

= 92.

Question 19:

Let the ten's digit be x and the unit digit be y respectively.

Then, required number = 10x + y

According to the given question:

$$10x + y = 4(x + y)$$

$$6x - 3y = 0$$

$$2x - y = 0 ---(1)$$

And

10x + y = 2xy ---(2)

Putting y = 2x from (1) in (2), we get

$$10x + 2x = 4x^2 \Rightarrow 12x - 4x^2 = 0 \Rightarrow 4x(3-x) = 0 \Rightarrow x = 3$$

Putting x = 3 in (1), we get

$$2 \times 3 - y = 0$$

y = 6

Hence, the required number = $3 \times 10 + 6$

= 36.

Question 20:

Let the numerator and denominator of fraction be x and y respectively.

According to the question:

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

And

$$\frac{x+3}{y+3} = \frac{3}{4}$$

$$\Rightarrow 4x + 12 = 3y + 9$$

$$\Rightarrow 4x - 3y = -3 - --(2)$$
Multiplying (1) be 3 and (2) by 1
$$3x + 3y = 24 - --(3)$$

$$4x - 3y = -3 - --(4)$$
Add (3) and (4), we get
$$7x = 21$$

$$x = 21/7 = 3$$
Putting $x = 3$ in (1), we get
$$3 + y = 8$$

$$y = 8 - 3$$

$$y = 5$$

$$x = 3, y = 5$$

Hence, the fraction is x/y = 3/5

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