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

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

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

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

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 × 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 × 3 - y = 0
y = 6
Hence, the required number = 3 × 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

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

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

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

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 **********