

Playing with Numbers

Ex 5A

Q1

Answer :

Let the tens place digit be x .

The units place digit is 3.

$$\therefore \text{Number} = (10x + 3) \quad \dots (1)$$

Given:

$$7(x + 3) = (10x + 3)$$

$$7x + 21 = 10x + 3$$

$$\therefore 10x - 7x = 21 - 3$$

$$\Rightarrow 3x = 18$$

$$\text{or } x = 6$$

Using $x = 6$ in equation (1):

The number is 63.

Q2

Let the tens digit be x .

The digit in the units place is $2x$.

$$\text{Number} = 10x + 2x$$

Given:

$$(x + 2x) + 18 = (10x + 2x)$$

$$\therefore 3x + 18 = 12x$$

$$12x - 3x = 18$$

$$9x = 18$$

$$x = 18 \div 9 = 2$$

The digit in the tens place is 2.

The digit in the units place is twice the digit in the tens place.

The digit in the units place is 4.

Therefore, the number is 24.

Q3

Answer :

Let the tens place digit be a and the units place digit be b .

Then, number is $(10a + b)$.

According to the question:

$$4(a + b) + 3 = (10a + b)$$

$$4a + 4b + 3 = 10a + b$$

$$6a - 3b = 3$$

$$3(2a - b) = 3$$

$$2a - b = 1 \quad \dots (1)$$

Given:

If 18 is added to the number, its digits are reversed.

The reverse of the number is $(10b + a)$.

$$\therefore (10a + b) + 18 = 10b + a$$

$$10a - a + b - 10b = -18$$

$$9a - 9b = -18$$

$$9(a - b) = -18$$

$$a - b = -2 \quad \dots (2)$$

Subtracting equation (2) from equation (1):

$$\begin{array}{r} 2a - b = 1 \\ a - b = -2 \\ \hline - \quad + \quad + \\ a \quad \quad = 3 \end{array}$$

Using $a = 3$ in equation (1):

$$2(3) - b = 1$$

$$6 - b = 1$$

$$\therefore b = 5$$

$$\text{Number} = 10a + b = 10 \times 3 + 5 = 35$$

Q4

Answer :

Let the tens place digit be a and the units place digit be b .
Then, the number is $(10a + b)$.

Given:

$$a + b = 15 \quad \dots (1)$$

When the digits are interchanged the number will be $(10b + a)$.

Given:

$$10a + b + 9 = 10b + a$$

$$\therefore 10a - a + b - 10b = -9$$

$$9a - 9b = -9$$

$$a - b = -1 \quad \dots (2)$$

Adding equations (1) and (2):

$$\begin{array}{r} a + b = 15 \\ a - b = -1 \\ \hline 2a \quad = 14 \\ \therefore a = 7 \end{array}$$

Using $a = 7$ in equation (2):

$$7 - b = -1$$

$$\therefore b = 8$$

$$\text{Original number} = 10a + b = 10 \times 7 + 8 = 78$$

Q5

Answer :

Let the tens place digit be ' x ' and the units place digit be ' y '.
 \therefore Number = $(10x + y)$

Number obtained by interchanging the digits = $(10y + x)$

$$\text{Given: } (10x + y) - (10y + x) = 63$$

$$\therefore 10x - x + y - 10y = 63$$

$$9x - 9y = 63$$

$$9(x - y) = 63$$

$$x - y = 7$$

Therefore, the difference between the digits of the number is 7.

Q6

Answer :

Let the units place digit be x .

Then, the tens place digit will be $3x$ and the hundreds place digit will be $4x$.

Given:

$$4x + 3x + x = 16$$

$$\text{or } 8x = 16$$

$$\text{or } x = 2$$

$$\text{Units place digit} = 2$$

$$\text{Tens place digit} = 3 \times 2 = 6$$

$$\text{Hundreds place digit} = 4 \times 2 = 8$$

Therefore, the number is 862.