UNIQUE STUDY POINT

PREPARED BY : SUMEET SAHU

QUESTIONS BASED ON TWO DIGITS NUMBERS

WWW.UNIQUESTUDYONLINE.COM

The sum of the digits of a two-digit number is 12. *The number obtained by interchanging its digits exceeds the given number by* 18. *Find the number.* [CBSE 2006]

Let the ten's digit of the required number be x and the unit's digit be y. Then,

$$x + y = 12. \qquad \ldots \text{(i)}$$

Required number = $(10x + y)$.

Number obtained on reversing the digits = $(10y + x)$.

$$\therefore \quad (10y + x) - (10x + y) = 18 \Rightarrow 9y - 9x = 18$$

$$\Rightarrow y - x = 2. \qquad \ldots \text{(ii)}$$

On adding (i) and (ii), we get

$$2y = 14 \Rightarrow y = 7.$$

Putting $y = 7$ in (i), we get

$$x + 7 = 12 \Rightarrow x = 12 - 7 = 5.$$

$$\therefore \quad x = 5 \text{ and } y = 7.$$

Hence, the required number is 57.

The sum of a two-digit number and the number obtained by reversing the order of its digits is 99. If the digits differ by 3, find the number.

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

Then, the number = $(10x + y)$.

The number obtained on reversing the digits = $(10y + x)$.

$\therefore \quad (10y + x) + (10x + y) = 99 \Rightarrow 11(x + y) = 99 \Rightarrow x + y = 9.$

Also, $(x - y) = \pm 3$.

Thus, we have

$$\left.\begin{aligned} x + y &= 9 \quad \ldots (i) \\ x - y &= 3 \quad \ldots (ii) \end{aligned}\right\} \quad \text{or} \quad \left\{\begin{aligned} x + y &= 9 \quad \ldots (iii) \\ x - y &= -3 \quad \ldots (iv) \end{aligned}\right.$$

From (i) and (ii), we get $x = 6, y = 3$.

From (iii) and (iv), we get $x = 3, y = 6$.

Hence, the required number is 63 or 36.

Seven times a two-digit number is equal to four times the number obtained by reversing the order of its digits. If the difference between the digits is 3, find the number.

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

Then, the number = $(10x + y)$.

The number obtained by reversing the digits = $(10y + x)$.

$\therefore \quad 7(10x + y) = 4(10y + x) \Rightarrow 33(2x - y) = 0$

$\Rightarrow \quad 2x - y = 0 \Rightarrow y = 2x$ … (i)

Thus, unit's digit = 2 times the ten's digit.

$\therefore$ (unit's digit) > (ten's digit) and so $y > x$.

$\therefore \quad y - x = 3.$ … (ii)

Using (i) in (ii), we get $(2x - x) = 3 \Rightarrow x = 3$.

On substituting $x = 3$ in (i), we get $y = 2 \times 3 = 6$.

Hence, the required number is 36.

A two-digit number is four times the sum of its digits and twice the product of its digits. Find the number. [CBSE 2005]

Let the ten's digit of the required number be x and its unit's digit be y.

Then, $10x + y = 4(x + y) \Rightarrow 6x - 3y = 0 \Rightarrow 2x - y = 0.$ ... (i)

Also, $10x + y = 2xy.$ ... (ii)

Putting $y = 2x$ from (i) in (ii), we get

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

$$\Rightarrow 4x(x - 3) = 0$$

$$\Rightarrow x - 3 = 0 \Rightarrow x = 3 \quad [\because \text{ten's digit}, x \neq 0].$$

Putting $x = 3$ in (i), we get $y = 6$.

Thus, ten's digit = 3 and unit's digit = 6.

Hence, the required number is 36.