

Assignment No.1

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Download all python codes from

https://github.com/Abhishek7008/Assignment_1.git

and latex-tikz codes from

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By multiplication of A^{-1} with 2.0.3 gives

$$\begin{aligned} \mathbf{A}^{-1}\mathbf{A}\begin{pmatrix} x \\ y \end{pmatrix} &= \mathbf{A}^{-1}\begin{pmatrix} 12 \\ 2 \end{pmatrix} \\ \begin{pmatrix} x \\ y \end{pmatrix} &= \begin{pmatrix} \frac{1}{2} & \frac{-1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix} \begin{pmatrix} 12 \\ 2 \end{pmatrix} \\ \begin{pmatrix} x \\ y \end{pmatrix} &= \begin{pmatrix} 5 \\ 7 \end{pmatrix} \end{aligned}$$

1 QUESTION No.1

The sum of the digits of a two-digit number is 12. The number obtained by interchanging the two digits exceeds the given number by 18. Find the number ?.

2 SOLUTION

Let the tens digit of the required number be x and the units digit be y . Then,

$$x + y = 12 \quad (2.0.1)$$

Required Number = $(10x + y)$

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

Therefore,

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

$$\Rightarrow 9y - 9x = 18$$

$$\Rightarrow y - x = 2 \quad (2.0.2)$$

Solving 2.0.1 and 2.0.2 , By Matrix method

$$\begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 12 \\ 2 \end{pmatrix} \quad (2.0.3)$$

Let

$$\mathbf{A} = \begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix}$$

We know that

$$\mathbf{A}^{-1} = \begin{pmatrix} \frac{1}{2} & \frac{-1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix}$$

As Required Number $(10x + y)$

$$\Rightarrow 10(5) + y = 57$$

Hence, the required number is 57.