

Assignment No.1

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Download all python codes from

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

and latex-tikz codes from

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

$$\begin{pmatrix} 1 & 1 & 12 \\ -1 & 1 & 2 \end{pmatrix} \xrightarrow{R_2 \leftarrow R_2 + R_1} \begin{pmatrix} 1 & 1 & 12 \\ 0 & 2 & 14 \end{pmatrix} \quad (2.0.6)$$

$$\begin{pmatrix} 1 & 1 & 12 \\ 0 & 2 & 14 \end{pmatrix} \xrightarrow{R_2 \leftarrow \frac{1}{2}R_2} \begin{pmatrix} 1 & 1 & 12 \\ 0 & 1 & 7 \end{pmatrix} \quad (2.0.7)$$

$$\begin{pmatrix} 1 & 1 & 12 \\ 0 & 1 & 7 \end{pmatrix} \xrightarrow{R_1 \leftarrow R_1 - R_2} \begin{pmatrix} 1 & 0 & 5 \\ 0 & 1 & 7 \end{pmatrix} \quad (2.0.8)$$

$$\Rightarrow \mathbf{x} = \begin{pmatrix} 5 \\ 7 \end{pmatrix} \quad (2.0.9)$$

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 ?. [CBSE/MATH/10/2006 set2- Q1(b)]

Whereas

$$\mathbf{x} = \begin{pmatrix} x \\ y \end{pmatrix} \quad (2.0.10)$$

So,

$$\Rightarrow \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 7 \end{pmatrix} \quad (2.0.11)$$

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,

$$\Rightarrow (10y + x) - (10x + y) = 18 \quad (2.0.2)$$

$$\Rightarrow 9y - 9x = 18 \quad (2.0.3)$$

$$\Rightarrow y - x = 2 \quad (2.0.4)$$

Solving 2.0.1 and 2.0.4, can be expressed as a Matrix Equation

$$\begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix} \mathbf{x} = \begin{pmatrix} 12 \\ 2 \end{pmatrix} \quad (2.0.5)$$

The augmented matrix for the above equation is row reduced as follows

As Required Number $(10x + y)$

$$\Rightarrow 10(5) + y = 57 \quad (2.0.12)$$

Hence, the required number is 57.

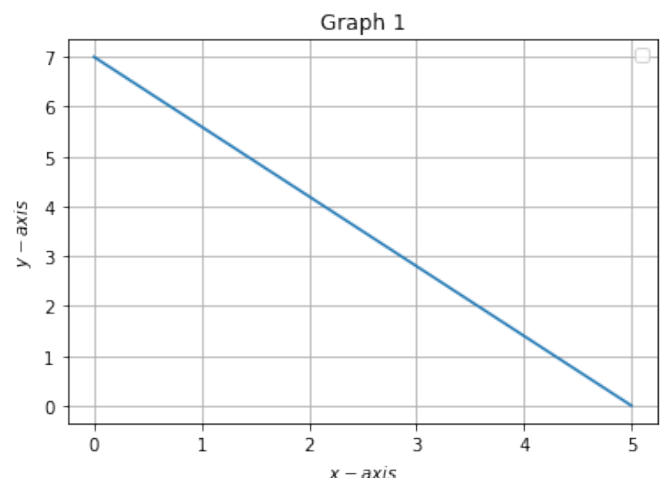


Fig. 0: Graphical Figure