

# Assignment 10

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Download all python codes from

<https://github.com/ooharapolu/Matrix-Theory/tree/main/Assignment10/Codes>

and latex-tikz codes from

<https://github.com/ooharapolu/Matrix-Theory/tree/main/Assignment10>

## 1 QUESTION No. 2.53

Solve  $x+y \leq 9, y > x, x \geq 0$

## 2 SOLUTION

Let  $x+y=9$  intersects the  $x$ -axis and  $y$ -axis at **A** and **B** respectively. Let,

$$\mathbf{A} = \begin{pmatrix} x \\ 0 \end{pmatrix} \Rightarrow x = 9 \Rightarrow \mathbf{A} = \begin{pmatrix} 9 \\ 0 \end{pmatrix} \quad (2.0.1)$$

$$\mathbf{B} = \begin{pmatrix} 0 \\ y \end{pmatrix} \Rightarrow y = 9 \Rightarrow \mathbf{B} = \begin{pmatrix} 0 \\ 9 \end{pmatrix} \quad (2.0.2)$$

Origin  $= \begin{pmatrix} 0 \\ 0 \end{pmatrix}$  does satisfy the equation  $x+y \leq 9$

The solution is the left side of the line  $x+y=9$ .

Now, let  $y=x$  intersects the  $x$ -axis and  $y$ -axis at **C** and **D** respectively. Let,

$$\mathbf{C} = \begin{pmatrix} 0 \\ y \end{pmatrix} \Rightarrow y = 0 \Rightarrow \mathbf{C} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (2.0.3)$$

$$\mathbf{D} = \begin{pmatrix} x \\ 2 \end{pmatrix} \Rightarrow x = 2 \Rightarrow \mathbf{D} = \begin{pmatrix} 2 \\ 2 \end{pmatrix} \quad (2.0.4)$$

Origin  $= \begin{pmatrix} 9 \\ 0 \end{pmatrix}$  does not satisfy the equation  $x > y$

The solution is the left side of the line  $x=y$

Also,  $x \geq 0$ . So, the solution is the right side of  $y$ -axis.

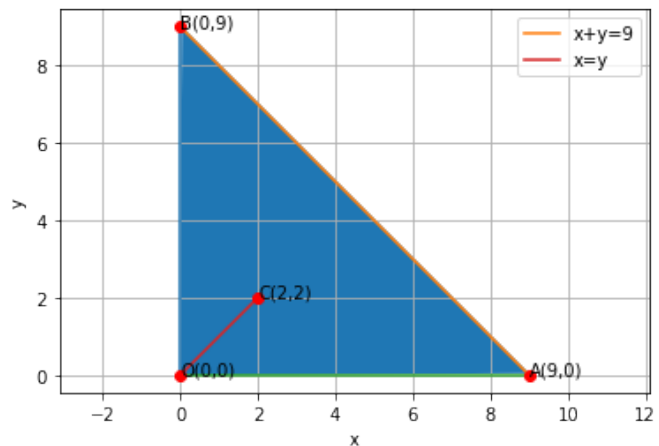


Fig. 2.1: fig:2.0