

# ASSIGNMENT 9

ATLA KEERTHANA

Download all python codes from

<https://github.com/Atlakeerthana/Assignment9/tree/main/Assignment9>

Latex-tikz codes from

<https://github.com/Atlakeerthana/Assignment9/tree/main/Assignment9>

## 1 QUESTION No 2.39

Solve  $3x+4y \leq 12$ .

## 2 SOLUTION

Let  $(3 \ 4)\mathbf{x} = 12$  intersects the x-axis and y-axis at **A** and **B** respectively.

1) Let  $\mathbf{A} = \begin{pmatrix} x \\ 0 \end{pmatrix}$

Put **A** in equation

$$(3 \ 4)\begin{pmatrix} x \\ 0 \end{pmatrix} = 12 \quad (2.0.1)$$

$$\Rightarrow x = 4 \quad (2.0.2)$$

$$\therefore \mathbf{A} = \begin{pmatrix} 4 \\ 0 \end{pmatrix} \quad (2.0.3)$$

2) Let  $\mathbf{B} = \begin{pmatrix} 0 \\ y \end{pmatrix}$

Put **B** in equation

$$(3 \ 4)\begin{pmatrix} 0 \\ y \end{pmatrix} = 12 \quad (2.0.4)$$

$$\Rightarrow y = 3 \quad (2.0.5)$$

$$\therefore \mathbf{B} = \begin{pmatrix} 0 \\ 3 \end{pmatrix} \quad (2.0.6)$$

3) Origin  $= \begin{pmatrix} 0 \\ 0 \end{pmatrix}$  satisfy the equation  $(3 \ 4)\mathbf{x} \leq 12$   
 $\Rightarrow$  The solution is the right side of the line  $(3 \ 4)\mathbf{x} = 12$

4) The following python code is the diagrammatic representation of the solution in Fig. 2.1

Solution of  $3x+4y = 12$

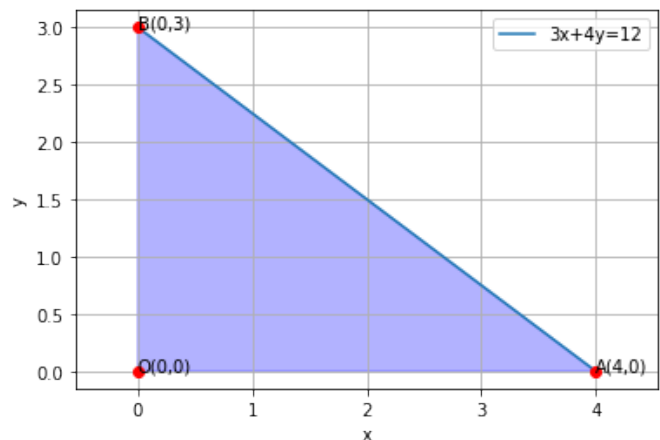


Fig. 2.1: Graphical Solution