ASSIGNMENT 9

ATLA KEERTHANA

1 QUESTION No 2.40

solve $Y+8 \leq 2x$

2 SOLUTION

Let $-2X+Y \geq -8$

$\begin{pmatrix} 3 & 4 \end{pmatrix} \mathbf{x} = 12$ intersects the x-axis and y-axis at $\mathbf{A}$ and $\mathbf{B}$ respectively.

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

   Put $\mathbf{A}$ in equation

$$\begin{pmatrix} -2 & 1 \end{pmatrix}\begin{pmatrix} x \\ 0 \end{pmatrix} = -8 \qquad (2.0.1)$$

$$\implies x = 4 \qquad (2.0.2)$$

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

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

   Put $\mathbf{B}$ in equation

$$\begin{pmatrix} -2 & 1 \end{pmatrix}\begin{pmatrix} 0 \\ y \end{pmatrix} = -8 \qquad (2.0.4)$$

$$\implies y = -8 \qquad (2.0.5)$$

$$\therefore \mathbf{B} = \begin{pmatrix} 0 \\ -8 \end{pmatrix} \qquad (2.0.6)$$

3) Origin $= \begin{pmatrix} 0 \\ 0 \end{pmatrix}$ satisfy the equation $\begin{pmatrix} -2 & 1 \end{pmatrix}\mathbf{x}{-}8$

   $\implies$ The solution is the right side of the line $\begin{pmatrix} -2 & 1 \end{pmatrix}\mathbf{x} = $ -8

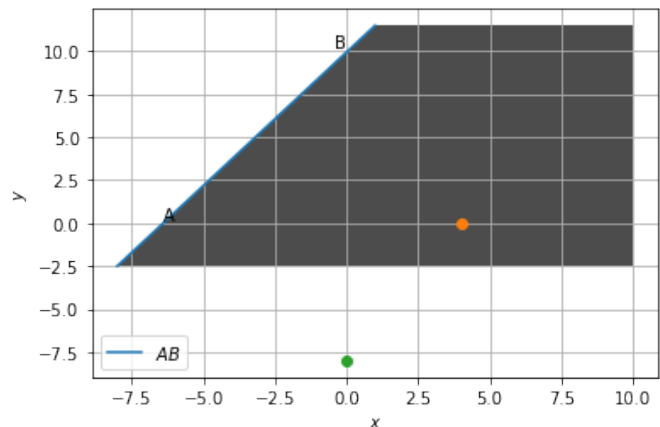4) The following python code is the diagrammatic representation of the solution in Fig. 2.1

Solution of $-2x+Y \geq -8$

Fig. 2.1: Graphical Solution