

Assignment - 4

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MD/2020/712

Download all and latex-tikz codes from
svn co <https://github.com/Ganeshyadav712/Assignment-4.git>

Question taken from

https://github.com/gadepall/ncert/blob/main/linalg/linear_forms/gvv_ncert_linear_forms.pdf-2.3 a,c

In this equation there is no constant thus line passes through origin,
so

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (9)$$

for \mathbf{Q} point,
let $\mathbf{x} = \begin{pmatrix} x \\ y \end{pmatrix}$ substitute in (8)

$$\begin{pmatrix} 3 & -1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = 0 \quad (10)$$

$$x = 1 \quad (11)$$

$$\Rightarrow y = 3 \quad (12)$$

$$\mathbf{Q} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} \quad (13)$$

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{Q} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$$

1 QUESTION

Draw the graphs of the following equations

$$a) \begin{pmatrix} 1 & 1 \end{pmatrix} \mathbf{x} = 4 \quad (1)$$

$$b) \begin{pmatrix} 3 & -1 \end{pmatrix} \mathbf{x} = 0 \quad (2)$$

2 SOLUTION

$$\begin{pmatrix} 1 & 1 \end{pmatrix} \mathbf{x} = 4$$

let $\mathbf{x} = \begin{pmatrix} a \\ 0 \end{pmatrix}$ substitute in (3)

$$\begin{pmatrix} 1 & 1 \end{pmatrix} \begin{pmatrix} a \\ 0 \end{pmatrix} = 4$$

$$a = 4$$

similarly let $\mathbf{x} = \begin{pmatrix} 0 \\ b \end{pmatrix}$ substitute in (3)

$$\begin{pmatrix} 1 & 1 \end{pmatrix} \begin{pmatrix} 0 \\ b \end{pmatrix} = 4$$

$$b = 4$$

intercept on X and Y axis for equation 1 can be

$$\mathbf{A} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ 4 \end{pmatrix}$$

$$b) \begin{pmatrix} 3 & -1 \end{pmatrix} \mathbf{x} = 0 \quad (8)$$

(3) Graphs of the both equations constructed by using python as

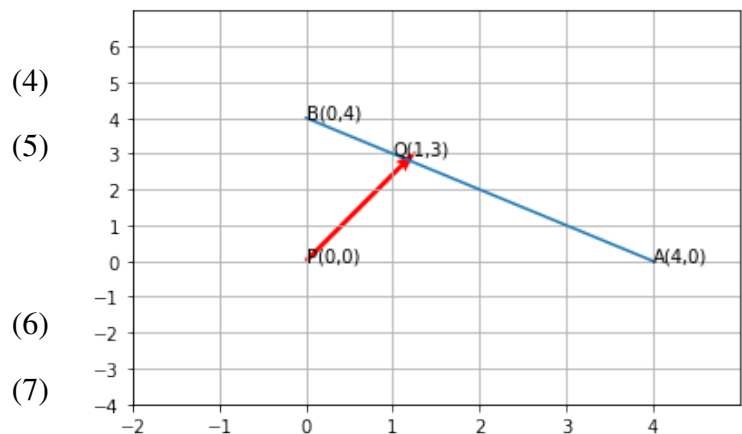


Fig. 2.1. Graph 4