

# Assignment - 4

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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](https://github.com/gadepall/ncert/blob/main/linalg/linear_forms/gvv_ncert_linear_forms.pdf-2.3%20a,c)

## 1 QUESTION

1.1. Draw the graphs of the following equations

a)

$$(1 \ 1)\mathbf{x} = 4 \quad (1.1.1)$$

b)

$$(3 \ -1)\mathbf{x} = 0 \quad (1.1.2)$$

**Solution:**

a)

$$(1 \ 1)\mathbf{x} = 4 \quad (1.1.3)$$

let  $\mathbf{x} = \begin{pmatrix} a \\ 0 \end{pmatrix}$  substitute in (1.1.3)

$$(1 \ 1)\begin{pmatrix} a \\ 0 \end{pmatrix} = 4 \quad (1.1.4)$$

$$a = 4 \quad (1.1.5)$$

similarly let  $\mathbf{x} = \begin{pmatrix} 0 \\ b \end{pmatrix}$  substitute in (1.1.3)

$$(1 \ 1)\begin{pmatrix} 0 \\ b \end{pmatrix} = 4 \quad (1.1.6)$$

$$b = 4 \quad (1.1.7)$$

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)

$$(3 \ -1)\mathbf{x} = 0 \quad (1.1.8)$$

In equation (1.1.8) there is no constant thus line passes through origin, so

$$\mathbf{P} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (1.1.9)$$

for  $\mathbf{Q}$  point,

let  $\mathbf{x} = \begin{pmatrix} x \\ y \end{pmatrix}$  substitute in (1.1.8)

$$(3 \ -1)\begin{pmatrix} x \\ y \end{pmatrix} = 0 \quad (1.1.10)$$

$$x = 1 \quad (1.1.11)$$

$$\Rightarrow y = 3 \quad (1.1.12)$$

$$\mathbf{Q} = \begin{pmatrix} 1 \\ 3 \end{pmatrix} \quad (1.1.13)$$

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

Graphs of the both equations constructed by using python as

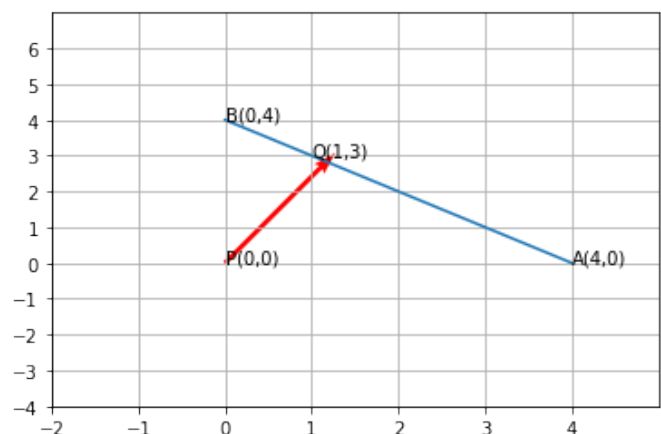


Fig. 1.1. Graph 4