

Assignment No.4

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Download all python codes from

<https://github.com/Vallidevibolla/Assignment-4/blob/main/code.py>

and latex-tikz codes from

<https://github.com/Vallidevibolla/Assignment-4/blob/main/main.tex>

Question taken from

https://github.com/gadepall/ncert/blob/main/linalg/linear_forms/gvv_ncert_linear_forms.pdf-Q.no.2.1

Substitute

$$\mathbf{x} = \begin{pmatrix} 2 \\ 0 \end{pmatrix} \text{ in (2.0.1)} \quad (2.0.8)$$

$$\mathbf{y} = \begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} 2 \\ 0 \end{pmatrix} \quad (2.0.9)$$

$$\boxed{\mathbf{y} = 2} \quad (2.0.10)$$

Substitute

$$\mathbf{x} = \begin{pmatrix} \sqrt{2} \\ 4\sqrt{2} \end{pmatrix} \text{ in (2.0.1)} \quad (2.0.11)$$

$$\mathbf{y} = \begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} \sqrt{2} \\ 4\sqrt{2} \end{pmatrix} \quad (2.0.12)$$

$$\boxed{\mathbf{y} = -7\sqrt{2}} \quad (2.0.13)$$

1 QUESTION No.2.1

Check which of the following are solutions of the equation

$$\begin{pmatrix} 1 & -2 \end{pmatrix} \mathbf{x} = 4 \quad (1.0.1)$$

$$(a) \begin{pmatrix} 0 \\ 2 \end{pmatrix} (b) \begin{pmatrix} 4 \\ 0 \end{pmatrix} (c) \begin{pmatrix} 2 \\ 0 \end{pmatrix} (d) \begin{pmatrix} \sqrt{2} \\ 4\sqrt{2} \end{pmatrix} (e) \begin{pmatrix} 1 \\ 1 \end{pmatrix} \quad (1.0.2)$$

2 SOLUTION

Given $\begin{pmatrix} 1 & -2 \end{pmatrix} \mathbf{x} = 4$

Let 'y' be the solution then equation be

$$\boxed{\mathbf{y} = \begin{pmatrix} 1 & -2 \end{pmatrix} \mathbf{x}} \quad (2.0.1)$$

Substitute

$$\mathbf{x} = \begin{pmatrix} 0 \\ 2 \end{pmatrix} \text{ in (2.0.1)} \quad (2.0.2)$$

$$\mathbf{y} = \begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} 0 \\ 2 \end{pmatrix} \quad (2.0.3)$$

$$\boxed{\mathbf{y} = -4} \quad (2.0.4)$$

Substitute

$$\mathbf{x} = \begin{pmatrix} 4 \\ 0 \end{pmatrix} \text{ in (2.0.1)} \quad (2.0.5)$$

$$\mathbf{y} = \begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} 4 \\ 0 \end{pmatrix} \quad (2.0.6)$$

$$\boxed{\mathbf{y} = 4} \quad (2.0.7)$$

Substitute

$$\mathbf{x} = \begin{pmatrix} 1 \\ 1 \end{pmatrix} \text{ in (2.0.1)} \quad (2.0.14)$$

$$\mathbf{y} = \begin{pmatrix} 1 & -2 \end{pmatrix} \begin{pmatrix} 1 \\ 1 \end{pmatrix} \quad (2.0.15)$$

$$\boxed{\mathbf{y} = -1} \quad (2.0.16)$$

$\therefore \mathbf{x} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$ is the solution of the equation $\begin{pmatrix} 1 & -2 \end{pmatrix} \mathbf{x} = 4$

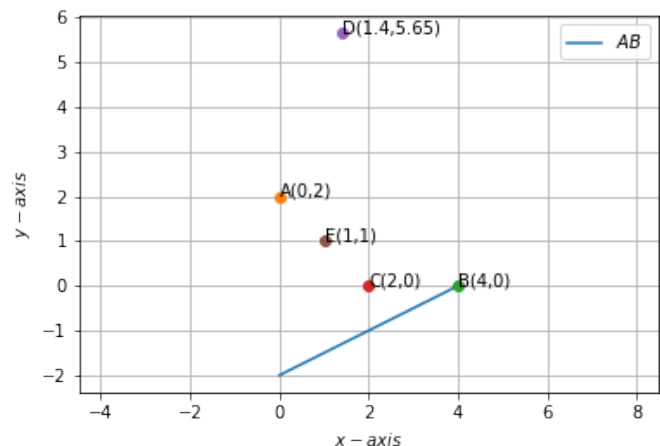


Fig. 2.1: Solution