Assignment No.

Your Name

Download all python codes from

https://github.com/Vallidevibolla/Assignment−4/new/main

and latex-tikz codes from

https://github.com/Vallidevibolla/Assignment−4/new/main

Question taken from

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

1 Question No.2.1

Check which of the following are solutions of the equation

$$\begin{pmatrix}1 & -2\end{pmatrix} x = 4 \tag{1.0.1}$$

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

2 Solution

Given $\begin{pmatrix}1 & -2\end{pmatrix}$x=4
let 'y' be the solution then equation be

$$\boxed{y = \begin{pmatrix}1 & -2\end{pmatrix} x} \tag{2.0.1}$$

$$(a)Substitute x = \begin{pmatrix}0\\2\end{pmatrix} in (2.0.1) \tag{2.0.2}$$

$$y = \begin{pmatrix}1 & -2\end{pmatrix}\begin{pmatrix}0\\2\end{pmatrix} \tag{2.0.3}$$

$$\boxed{y = -4} \tag{2.0.4}$$

$$(b)Substitute x = \begin{pmatrix}4\\0\end{pmatrix} in (2.0.1) \tag{2.0.5}$$

$$y = \begin{pmatrix}1 & -2\end{pmatrix}\begin{pmatrix}4\\0\end{pmatrix} \tag{2.0.6}$$

$$\boxed{y = 4} \tag{2.0.7}$$

$$(c)Substitute x = \begin{pmatrix}2\\0\end{pmatrix} in (2.0.1) \tag{2.0.8}$$

$$y = \begin{pmatrix}1 & -2\end{pmatrix}\begin{pmatrix}2\\0\end{pmatrix} \tag{2.0.9}$$

$$\boxed{y = 2} \tag{2.0.10}$$

$$(d)Substitute x = \begin{pmatrix}\sqrt{2}\\4\sqrt{2}\end{pmatrix} in (2.0.1) \tag{2.0.11}$$

$$y = \begin{pmatrix}1 & -2\end{pmatrix}\begin{pmatrix}\sqrt{2}\\4\sqrt{2}\end{pmatrix} \tag{2.0.12}$$

$$\boxed{y = -7\sqrt{2}} \tag{2.0.13}$$

$$(e)Substitute x = \begin{pmatrix}1\\1\end{pmatrix} in (2.0.1) \tag{2.0.14}$$

$$y = \begin{pmatrix}1 & -2\end{pmatrix}\begin{pmatrix}1\\1\end{pmatrix} \tag{2.0.15}$$

$$\boxed{y = -1} \tag{2.0.16}$$

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