Assignment No.4

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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

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

Substitute

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

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

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

Substitute

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

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

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

Substitute

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

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

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

Substitute

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

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

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

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