EE3900 Assignment-4

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Download all python codes from

https://github.com/vrahul02/EE3900/tree/main/Assignment−4/Codes

and latex-tikz codes from

https://github.com/vrahul02/EE3900/tree/main/Assignment−4/Assignment−4.tex

Problem Linear Forms Q2.25

Find the intercepts cut off by the plane $\begin{pmatrix}2 & 1 & 1\end{pmatrix}\mathbf{x} = 5$.

Solution

Let a, b and c be the x, y and z intercept respectively.

Then, the points $\begin{pmatrix}a\\0\\0\end{pmatrix}$, $\begin{pmatrix}0\\b\\0\end{pmatrix}$ and $\begin{pmatrix}0\\0\\c\end{pmatrix}$ lies on the plane

$$\begin{pmatrix}2 & 1 & 1\end{pmatrix}\begin{pmatrix}a\\0\\0\end{pmatrix} = 5 \tag{0.0.1}$$

$$2 \times a = 5 \tag{0.0.2}$$

$$a = 2.5 \tag{0.0.3}$$

$$\begin{pmatrix}2 & 1 & 1\end{pmatrix}\begin{pmatrix}0\\b\\0\end{pmatrix} = 5 \tag{0.0.4}$$

$$b = 5 \tag{0.0.5}$$

$$\begin{pmatrix}2 & 1 & 1\end{pmatrix}\begin{pmatrix}0\\0\\c\end{pmatrix} = 5 \tag{0.0.6}$$

$$c = 5 \tag{0.0.7}$$

Thus the intercept cut off by the given plane is 2.5, 5 and 5 on x, y and z axis respectively.

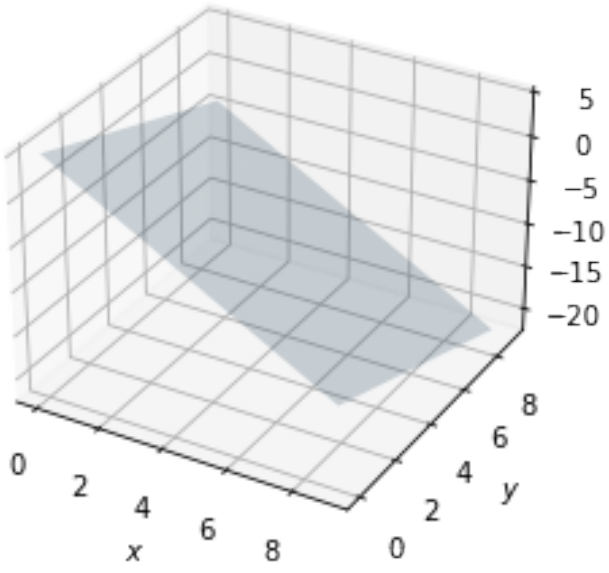

Fig. 0: 3D Plot