ASSIGNMENT-4

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1 QUESTION No-2.35 (b) (Linear forms)

Find the equation of the planes that passes through the point $\mathbf{A} = \begin{pmatrix} 1 \\ 4 \\ 6 \end{pmatrix}$ and the normal to the plane is $\mathbf{n} = \begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}$.

2 Solution

Given point $\mathbf{A} = \begin{pmatrix} 1 \\ 4 \\ 6 \end{pmatrix}$ and the normal vector to the plane is $\mathbf{n} = \begin{pmatrix} 1 \\ -2 \\ 1 \end{pmatrix}$.

Equation of the plane is given by

$$\mathbf{n}^T (\mathbf{x} - \mathbf{A}) = 0 \tag{2.0.1}$$

$$\begin{pmatrix} 1 & -2 & 1 \end{pmatrix} \mathbf{x} = \begin{pmatrix} 1 & -2 & 1 \end{pmatrix} \begin{pmatrix} 1 \\ 4 \\ 6 \end{pmatrix} \tag{2.0.2}$$

$$\begin{pmatrix} 1 & -2 & 1 \end{pmatrix} \mathbf{x} = -1 \tag{2.0.3}$$

Plot of the plane

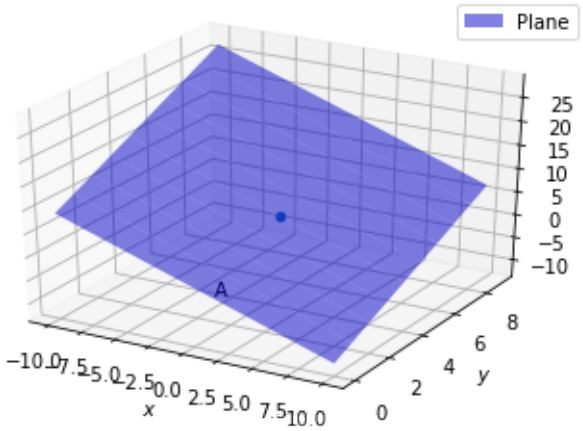

Fig. 2.1: Plot of the plane