Assignment 5

Sujal - AI20BTECH11020

Download all latex codes from

https://github.com/https://github.com/sujal100/EE3900/blob/main/Assignment5/Assignment5.tex

Download all python codes from

https://github.com/https://github.com/sujal100/EE3900/blob/main/Assignment5/codes/code.py

1 Problem

(Quadratic forms Q-2.21) Solve $x^2 + 2 = 0$

2 Solution

To solve the equation - $x^2 + 2 = 0$

The given equation can be represented as follows in the vector form

$$\mathbf{x}^T \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix} \mathbf{x} + \begin{pmatrix} 0 & 0 \end{pmatrix} \mathbf{x} + 2 = 0 \tag{2.0.1}$$

where,

$$\mathbf{x} = \begin{pmatrix} x \\ 0 \end{pmatrix} \tag{2.0.2}$$

$$x^2 + 2 = 0 \tag{2.0.3}$$

The discriminant is

$$D = b^2 - 4ac \tag{2.0.4}$$

$$= -8 \quad < 0 \tag{2.0.5}$$

Thus the equation has no real roots as can be seen from Fig. 0

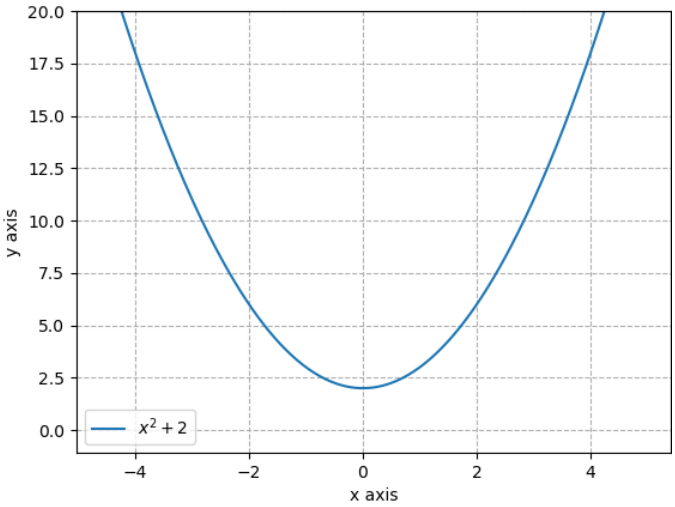

Fig. 0: $x^2 + 2$ generated using python