ISyE 6669 HW 4

Minimize each of the following functions using an appropriate routine from `scipy.optimize`. Provide a printout of your code, along with the solution.

1. $f(x_1, x_2, x_3) = |x_1^2 - 3x_3 + 4| + (x_2 - 3)^2$ starting from the point $(0, 0, 0)$
2. $f(x) = (x - 1)x(x + 3) + x^4$ over the interval $[-10, 10]$
3. Let $A = \begin{bmatrix} 2 & -3 \\ 4 & 1 \end{bmatrix}$ and $\mathbf{b} = \begin{bmatrix} 1 \\ 9 \end{bmatrix}$. Then $f(\mathbf{x}) = ||A\mathbf{x} - \mathbf{b}||$ where $\mathbf{x} \in \mathbb{R}^2$. Start from $(0, 0)$.