

Homework4 Function Optimization

1. Find the (local/global) maxima/minima of the following functions on the prescribed interval.

a. $f(x) = x^3 + 2x^2 + 5$ $-1 \leq x \leq 1$

b. $f(x) = 2\sqrt{x^2 + 4} + 4 - x$ $0 \leq x \leq 2$

2. Find the model parameters (find all the unknowns) that best fit the data in [xydata1.dat](#). Plot the data points on top of the best fit curve (first column represents the x-coordinates and the second column represents the y-coordinates of the data).
3. Find the model parameters (find all the unknowns) that best fit the data in [xydata2.dat](#). Plot the data points on top of the best fit curve (first column represents the x-coordinates and the second column represents the y-coordinates of the data).
4. Maximizing a circuit output for given input conditions. Find the resistance R_2 that maximizes the power going through the resistor R_2 . Here $V_{in}=5V$, $R_1=10$; $R_3=5$;

Using circuit analysis, the power $P(R_2) = \frac{V^2}{R_2}$ where $V = \frac{5R_2}{15R_2 + 50}$

