

MATH3404, Tutorial problem sheet 1(week 2)

Question 1*. Find the local and global minimum (when it exists) of the following function:

(i)
$$f(x) = \begin{cases} -x^3, & -\infty < x \leq 1 \\ x - 3, & 1 < x < \infty \end{cases}$$

Question 2. Find the local and global minimum (when it exists) of the following function:

(ii)
$$f(x) = 2x^3 - 9x^2 + 12, \quad -\infty < x < \infty$$

Question 3. Find the local maxima and minima of the function in \mathbb{R}^2 :

(iii)
$$f(x_1, x_2) = (x_1^2 - 4)^2 + x_2^2$$

Question 4. Find the local maxima and minima of the function in \mathbb{R}^2 :

(iv)
$$f(x_1, x_2) = x_1^3 + x_2^3 + 3x_1^2 - 3x_2^2 - 8$$