

M 383: Assignment 10

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Exercises 5.3.4 — Problem 1

Problem. Define

$$x_+ = \begin{cases} x & \text{if } x \leq 0 \\ 0 & \text{if } x < 0 \end{cases}$$

Prove that $f(x) = x_+^k$ is continuously differentiable if k is an integer greater than one.

Proof.

Exercises 5.2.4 — Problem 1

Problem. Suppose $f'(x_0) = 0, f''(x_0) = 0, \dots, f^{(n-1)}(x_0) = 0$ and $f^{(n)}(x_0) > 0$ for a C^n function f . Prove that f has a local minimum at x_0 if n is even and that x_0 is neither a local maximum nor a local minimum if n is odd.

Proof.