MATH 541, FALL 2023, HOMEWORK 12

Due Sunday, December 10, 2023 at 5pm Eastern time on Gradescope. Solve the following exercises:

Problem 1. Lawler, exercise 8.10.

Problem 2. Lawler, exercise 8.12.

Problem 3. Lawler, exercise 8.14.

Problem 4. Let $f : [0, \infty) \to \mathbb{R}$ be smooth and define, for $x \in \mathbb{R}^d$, the function
$$v(x) = f(|x|).$$
Using the chain rule, derive the expression for $\Delta v(x)$ $(x \neq 0)$ given in class.