Real Analysis II Homework 4

Due Date: May 15

Solve the following problems.

Problem 1 Prove that $L^\infty(E)$ is not separable for any E with $|E| > 0$.

Problem 2 Let $1 \leq p < \infty$ and $f \in L^p(\mathbb{R}^n)$. Show that

$$g(h) = \|f(x+h) - f(x)\|_p$$

is a uniformly continuous function. Is the same true when $0 < p < 1$?