Homework 5, Spring 2023:

Problem 5.1: Find an example showing that the product of two BMO functions may not be in BMO.

Problem 5.2: Prove that
$$\||f|^\alpha\|_{BMO} \leq 2\|f\|_{BMO}^\alpha$$
whenever $0 < \alpha \leq 1$.

Problem 5.3: Prove that $|\log|x||^p$ is not in $BMO(\mathbb{R})$ when $1 < p < \infty$.