## MATH 173, FALL 2022, HOMEWORK \#12

## ALEX IOSEVICH

## 1. Problems not from the book

Problem $\# 1$ : Let $a_{1}, a_{2}, \ldots, a_{N}$ be a sequence of positive real numbers. Let

$$
\mu=\frac{1}{N} \sum_{i=1}^{N} a_{i}
$$

Let $\lambda$ be a positive real number. Prove that

$$
\#\left\{i: a_{i}>\lambda\right\} \leq N \cdot \frac{\mu}{\lambda}
$$

Give some examples where this inequalities is pretty close to best possible, and examples where it is not. I am aware of the fact that I am not making the notion of "pretty close" precise.
2. PROBLEMS FROM THE BOOK

Section 5.2, problems 1, 2, 3, 4, 5, 8, 12
Section 5.3, problems 1, 2, 5, 6

