# MATH 173, FALL 2022, HOMEWORK \#5 

## ALEX IOSEVICH

## 1. Problems not from the book

Problem: Prove that if $a_{1}, a_{2}, \ldots, a_{n}$ are positive real numbers, then

$$
\left(\prod_{i=1}^{n} a_{i}\right)^{\frac{1}{n}} \leq \frac{1}{n} \sum_{i=1}^{n} a_{i} .
$$

Hint: First prove this when $n=2$. Then prove it for $n=2^{m}, m=1,2, \ldots$ by induction. Then prove it for all $n$ by arguing that if the inequality holds for $n+1$, then it holds for $n$.

## 2. Problems from the book

Section 2.3, problems 2, 3, 7, 10, 11, 12

