

HOMEWORK #1: MATH 265H, FALL 2022

ALEX IOSEVICH

1. PROBLEMS NOT IN THE BOOK

Problem #1: Prove from scratch (do not use any theorems from your previous classes or the internet) that if a, b, c, d are real numbers, then

$$abcd \leq \frac{a^4 + b^4 + c^4 + d^4}{4}.$$

Problem #2: Prove from scratch (do not use any theorems from your previous classes or the internet) that if

$$S_N = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \cdots + \frac{1}{N^2},$$

then

$$S_N \leq 2 \text{ for all } N \geq 1.$$

2. PROBLEMS FROM THE BOOK

Chapter 1, problems 1,2,4,5,7,8,10,12,15,17.