

MATH 1200 (SECTION E): HOMEWORK 4

DUE DATE: NOVEMBER 22 AT THE BEGINNING OF THE LECTURE

1. Use Mathematical Induction to prove that for all integers n ,

$$1 + \frac{1}{4} + \frac{1}{9} + \cdots + \frac{1}{n^2} \leq 2 - \frac{1}{n}.$$

2. How many subsets does $\{1\}$ have? How many subsets does $\{1, 2\}$ have? Find a formula for the number of subsets of $\{1, 2, \dots, n\}$, and use mathematical induction to prove your formula.