CS 13: Mathematical Foundations of Computing　　　　　　　　Fall 2023

Lecturcises 00 (due Friday, September 29 @ 11:30pm)

Directions: *These problems were presented within the last week as "exercises" in lecture. During lecture, you were able to collaborate with students, TAs, and Prof. Blank. Your task now is to write up solutions to these problems* **without discussing them with anyone**. *You should submit* **exactly ONE** *of the lecturcises below on Gradescope. Note that your submissions will be graded on* correctness, *not effort.*

Wed, Sept 27

The following are the lecturcises presented in lecture on Wednesday.

Functions

Prove that if $f : A \to B$ is strictly monotone, then it is injective.

Fri, Sept 29

The following are the lecturcises presented in lecture on Friday.

Induction

Prove that $3^n \geq n^2$ for all $n \geq 3$.

Strong induction (slide variant)

Prove that every $n \geq 2$ can be expressed as a product of primes.

Strong induction (handout variant)

Prove that every $n \geq 2$ has a prime divisor.