# Math 462 Homework 8

a lipson

June 03, 2025

**Problem** 1. Let $G$ be a simple graph, and let $v$ be a vertex of $G$. Let $G'$ be the graph obtained from $G$ by adding a new vertex $v'$ and drawing an edge from $v'$ to all the neighbors of $v$. Without using the strong perfect graph theorem, prove that $G$ is perfect iff $G'$ is perfect.

*Proof.*

□

**Problem** 2. Let $P$ be a poset such that the maximum size of an antichain is $a$ and the maximum size of a chain is $c$. Let $a'$ be the maximum size of an antichain of $P \times P$. Determine, as a function of $a$ and $c$, the maximum possible value of $a'$.

*Proof.*

□