Graph Theory 1, MATH 5340, Fall 2024

Homework 5, 2.1. Subgraphs and Supergraphs

Due Saturday, October 12, at 11:59 p.m.

Write in complete sentences!!! *Explain* what you are doing and convince me that you understand what you are doing and why. Justify all steps by quoting relevant results from the textbook, class notes, or hypotheses. Use the notation and techniques described in the in-class hints. Do not discuss homework problems with others. If you have any questions, then contact me (gardnerr@etsu.edu). Use the same notation and terminology we used in class and given in the in-class hints.

2.1.1. Prove that the maximal connected subgraphs of a graph are its components.

2.1.2. **(a)** Prove that every acyclic graph G with at least one edge has at least two vertices of degree less than two.

2.1.4. **(a)** Prove that every simple graph G contains a path of length δ.