Graph Theory 1, MATH 5340, Fall 2024

Homework 1, 1.1. Graphs and Their Representations

Due Saturday, August 31, 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. 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.

1.1.1. Let G be a simple graph. Prove that $m \leq \binom{n}{2}$, and determine when equality holds. Use the incidence function ψ_G and its properties in your proof.

1.1.3. Prove the following.

(b) A cycle of length $n \geq 3$ is bipartite if and only if its length is even.