Graph Theory 2, MATH 5450, Spring 2021

Homework 1, 4.1. Forests and Trees, Solutions

Due Wednesday, January 27, at 3:45

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 copy the work of others; **do your own work!!!**

4.1.1. (a) Show that every tree with maximum degree k has at least k leaves.

(b) Which such trees have exactly k leaves?

4.1.2. Prove that the following three statements are equivalent:

(a) G is connected and has $n - 1$ edges,

(b) G is a forest and has $n - 1$ edges, and

(c) G is a tree.

4.1.4. Let G be a graph and F a maximal forest of G. Prove that $e(F) = v(G) - c(G)$.