

Graph Theory 2, MATH 5450, Spring 2021

Homework 4, 5.1. Cut Vertices, 5.2. Separations and Blocks

Due Friday, February 19, at 1:40

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!!!**

5.1.3. Let G be a nontrivial connected graph without cut vertices, and let H be obtained from G by adding a new vertex v and joining it to two vertices of G . Prove that H has no cut vertices.

5.1.5. Prove that any two longest cycles in a loopless connected graph G without cut vertices have at least two vertices in common.

5.2.2. Let G be a graph and let e be an edge of G .

(a) If $G \setminus e$ is nonseparable and e is not a loop of G , then G is nonseparable.