Graph Theory 1, MATH 5340, Fall 2024

Homework 10, 3.2. Cut Edges, 3.3. Euler Tours

Due Saturday, November 23, 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.

3.2.3. Let G be a connected even graph. Prove that:

(a) G has no cut edge.

3.3.1. Which of the pictures in Figure 3.6 can be drawn without lifting one's pen from the paper and without tracing a line more than once? Use Theorem 3.3.A.

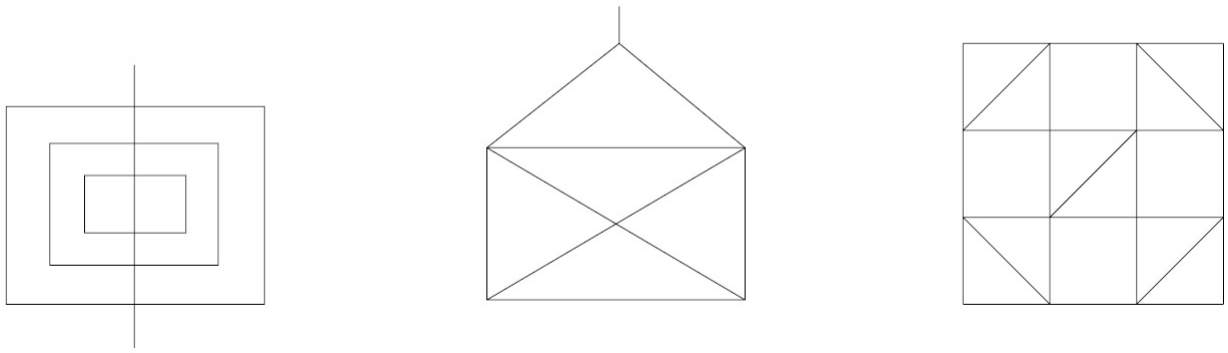

Figure 3.6. Tracing pictures.

3.3.4. Let G be a graph with two distinct specified vertices x and y, and let $G + e$ be the graph obtained from G by the addition of a new edge e joining x and y.

(a) Prove that G has an Euler trail connecting x and y if and only if $G + e$ has an Euler tour.