Graph Theory 1, MATH 5340, Fall 2020

Homework 8, 2.4. Decompositions and Coverings, Solutions

Due Sunday, October 25, at noon

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!!!**

2.4.1. Let e be an edge of an even graph G. Prove that G/e is even.

2.4.3. Find a decomposition of K_{13} into three copies of the circulant $CG(\mathbb{Z}_{13}, \{1, -1, 5, -5\})$. Recall (from Exercises 1.3.18 and 1.3.19) that a circulant is a Cayley graph $CG(\mathbf{Z}_n, S)$ where vertices $x, y \in \mathbb{Z}_n$ are adjacent if and only if $x - y \in S$.

2.4.5. Let $n \in \mathbb{N}$.

(a) Describe a decomposition of K_{2n+1} into Hamilton cycles.

(b) Prove that K_{2n} admits a decomposition into Hamilton paths.