

Valparaiso University
ValpoScholar

Symposium on Undergraduate Research and
Creative Expression (SOURCE)

Office of Sponsored and Undergraduate Research

Spring 2012

Equitable Labelings of Caterpillar Graphs

Mark Burek
Valparaiso University

William Olson
Valparaiso University

Brock Taulbee
Valparaiso University

Follow this and additional works at: <https://scholar.valpo.edu/cus>



Part of the [Computer Sciences Commons](#), and the [Mathematics Commons](#)

Recommended Citation

Burek, Mark; Olson, William; and Taulbee, Brock, "Equitable Labelings of Caterpillar Graphs" (2012). *Symposium on Undergraduate Research and Creative Expression (SOURCE)*. 132.
<https://scholar.valpo.edu/cus/132>

This Poster Presentation is brought to you for free and open access by the Office of Sponsored and Undergraduate Research at ValpoScholar. It has been accepted for inclusion in Symposium on Undergraduate Research and Creative Expression (SOURCE) by an authorized administrator of ValpoScholar. For more information, please contact a ValpoScholar staff member at scholar@valpo.edu.

Equitable Labelings of Caterpillar Graphs

Mark Burek, William Olson, Brock Taulbee

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

The Graceful Tree Conjecture in graph theory has been open for almost half a century. The conjecture states that the vertices of any tree can be labeled with distinct integers between 0 and the number of edges of the tree in a way that the edges can be uniquely identified by the absolute value of the difference between their vertex labels. One possible approach to prove the conjecture is to prove the more general k -equitable tree conjecture. In a k -equitable labeling we assign integers from the set $\{0, 1, 2, \dots, k-1\}$ to the vertices. Each edge will receive a label that is the absolute value of the difference of its vertex labels. We want to distribute the labels as equally as possible both for the edges and for the vertices. The conjecture states that this kind of labeling is possible for every tree and every k . This conjecture is equivalent to the graceful tree conjecture when k is the number of vertices of the tree. It has already been proven that every tree is 2-equitable and 3-equitable. We attempt to show a part of the k -equitable tree conjecture by choosing a large collection of trees called caterpillars, and examining different values of k .

Information about the Authors:

Mark Burek has a degree in psychology and is now pursuing a degree in mathematics with the goal of becoming a mathematician. William Olson is a freshman mathematics major from Sarasota, FL, who enjoys being involved on the Valpo campus. He hopes to continue doing research with the mathematics department in the upcoming semesters. Brock Taulbee is a freshman who plays on the men's soccer team. He enjoys working with numbers, and mathematics has been his favorite subject since elementary school. He is an actuarial science major who hopes to become a sports actuary.

Faculty Sponsor: Dr. Zsuzsanna Szaniszló

Student Contact: william.olson@valpo.edu