

Talk Math 2 Me

A New Interpretation of the Matrix Tree Theorem Using
Weak Walk Contributors and Cycle Activation: An
Undergraduate Thesis

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Abstract

We will examine what goes into writing an undergraduate thesis and the results that have come out of my research in graph theory. We begin by introducing the structures of oriented graphs and the matrices associated with them. By classifying elements called contributors according to similar circle structures, we develop a new interpretation of the matrix tree theorem using a known combinatorial interpretation of the entries of the Laplacian matrix of a graph. When we restrict our contributors to those corresponding to a given minor of the Laplacian matrix, the contributors that do not cancel are in one-to-one correspondence with the spanning trees of the graph.