Pi Mu Epsilon Induction Ceremony

"HP, or not 2HP,
that is the question"

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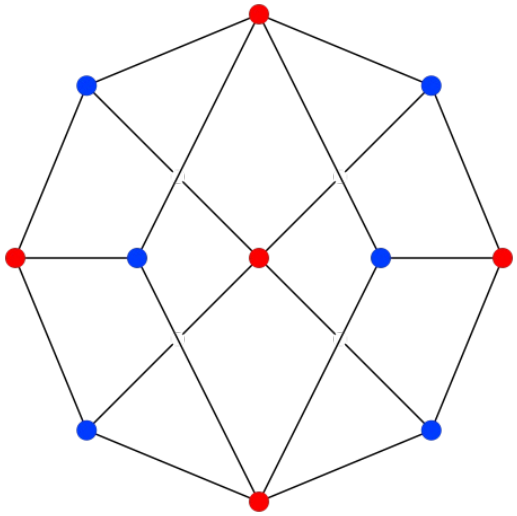
5-7, Williams 320



The Hamiltonian path problem is a well-known NP-complete graph theory problem which asks whether or not it is possible to find a path through all the vertices of a graph, visiting each vertex exactly once. We can think of this problem as the problem of whether or not we can visit cities all over the country, taking only direct flights, and visiting each city exactly once. Here we don't care about the order in which we visit the cities, but we will be restricted by the availability of direct flights. It is also likely that it will be most convenient to leave from a specific city, like Ithaca, and/or finish our journey at a specific city, like our hometown. These restrictions would give us two variations of the Hamiltonian path problem, 1HP and 2HP. Both problems are also NP-complete for graphs in general, though like the Hamiltonian path problem, they are polynomially solvable on certain types of graphs. 2-trees are a specific type of graph for which all three problems are polynomially solvable. Rather than running an algorithm on a computer to determine the answers to the HP, 1HP, and 2HP problems, I will discuss structural qualities of 2-trees that will determine whether such paths exist.