Seminar on Combinatorial Computing
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Some encouraging new negative results for graceful graphs

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Abstract

Since graceful graphs were defined in the early 1970's many results of the type: "Graph class X is graceful" have been published and their proofs have exhibited calculations showing how to number class X gracefully. These have been somewhat interesting, but have yielded very little insight into what properties determine if any other classes of graphs have graceful labelings.

Rarely are these facts as interesting as the following two results taken from the very earliest papers: "for more than 4 nodes, no complete graph is graceful", and "cycles are graceful if and only if the number of nodes is congruent to 0 or 3 (mod 4).

In the tradition of these negative results, we have recently found some others that might be useful in chipping away at what is and isn't graceful: 1. In considering one family of trees, it has been determined when the central vertex can be labeled with zero ...a potentially useful result in considering the long-unresolved question of whether all trees are graceful. 2. Necessary conditions on the number of nodes in a k-regular graceful graph have been determine that depend on k. Perhaps this will lead to conditions on more non-regular graphs.

So, in the usual manner of such things, these two limited results found in this-work-in-progress have suggested many more questions than they answer and raise hopes of discovering that mathematical holy grail: something profound and fundamental.

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or visit our website: http://math.gc.cuny.edu/Seminars/Combinatorics.html