

Application of the Combinatorial Nullstellensatz to Integer-magic Graph Labelings

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A graph is \mathbb{Z}_n -magic if there exists an edge labeling f using elements of $\mathbb{Z}_n \setminus \{0\}$ which induces a constant vertex labeling of the graph. In this talk, we use the Combinatorial Nullstellensatz to show (nonconstructively) the existence of \mathbb{Z}_p -magic labelings (prime $p \geq 3$) for various graphs. Through various examples, we illustrate the usefulness and limitations in applying the Combinatorial Nullstellensatz to the integer-magic graph labeling problem. Finally, we focus on \mathbb{Z}_3 -magic labelings and give some additional results for various classes of graphs.

This is joint work with Dan Roberts.

Key words: Integer-magic graphs, Combinatorial Nullstellensatz.