Seminar on Combinatorial Computing
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Antimagic labelings of regular bipartite graphs

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Abstract

A labeling of a graph is a bijection from its edges to the set \{1, 2, \ldots, |E(G)|\}. A labeling is antimagic if for every pair of distinct vertices \(u\) and \(v\), the sum of the labels on edges incident to \(u\) is different from the sum of the labels on edges incident to \(v\). We say a graph is antimagic if it has an antimagic labeling. In 1990, Hartfield and Ringel conjectured that every connected graph other than \(K_2\) is antimagic. The most significant progress was made by Alon et al. (in 2004), who showed there exists a constant \(C\) such that if an \(n\)-vertex graph \(G\) has \(\delta(G) \geq C\log n\), then \(G\) is antimagic. In this paper, we show that every regular bipartite graph (with degree at least 2) is antimagic.

Our technique relies heavily on the Marriage Theorem.

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