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Neighbor sum distinguishing total choosability of cubic graphs. (English) Zbl 07311129

Graphs Comb. 36, No. 5, 1545-1562 (2020).

Summary: Let $G=(V,E)$ be a graph and $\mathbb{R}$ be the set of real numbers. For a k-list total assignment L of G that assigns to each member $z\in V\cup E$ a set L_z of k real numbers, a neighbor sum distinguishing (NSD) total L-coloring of G is a mapping $\phi: V\cup E\to\mathbb{R}$ such that every member $z\in V\cup E$ receives a color of L_z, every pair of adjacent or incident members in $V\cup E$ receive different colors, and $\sum_{z\in E_G(u)\cup\{u\}}\phi(z)\neq\sum_{z\in E_G(v)\cup\{v\}}\phi(z)$ for each edge $uv\in E$, where $E_G(v)$ is the set of edges incident with v in G. *M. Pilśniak* and *M. Woźniak* [Graphs Comb. 31, No. 3, 771–782 (2015; Zbl 1312.05054)] posed the conjecture that every graph G with maximum degree Δ has an NSD total L-coloring with $L_z=\{1,2,\dots,\Delta+3\}$ for any $z\in V\cup E$, and confirmed the conjecture for all cubic graphs. In this paper, we extend their result by proving that every cubic graph has an NSD total L-coloring for any 6-list total assignment L.

MSC:

05C15 Coloring of graphs and hypergraphs

Keywords:

cubic graphs; neighbor sum distinguishing total choosability; combinatorial nullstellensatz

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