EQUITABLE COLORING AND EQUITABLE CHOOSABILITY OF GRAPHS WITH SMALL MAXIMUM AVERAGE DEGREE

AIJUN DONG

School of Science
Shandong Jiaotong University
Jinan, 250023, P.R. China

e-mail: dongaijun@mail.sdu.edu.cn

AND

XIN ZHANG

School of Mathematics and Statistics
Xidian University
Xi’an, 710071, P.R. China

e-mail: xzhang@xidian.edu.cn

Abstract

A graph is said to be equitably k-colorable if the vertex set $V(G)$ can be partitioned into $k$ independent subsets $V_1, V_2, \ldots, V_k$ such that $||V_i|−|V_j|| ≤ 1$ ($1 ≤ i, j ≤ k$). A graph $G$ is equitably k-choosable if, for any given $k$-uniform list assignment $L$, $G$ is $L$-colorable and each color appears on at most $\lceil \frac{|V(G)|}{k} \rceil$ vertices. In this paper, we prove that if $G$ is a graph such that $mad(G) < 3$, then $G$ is equitably $k$-colorable and equitably $k$-choosable where $k ≥ \max\{\Delta(G), 4\}$. Moreover, if $G$ is a graph such that $mad(G) < \frac{12}{5}$, then $G$ is equitably $k$-colorable and equitably $k$-choosable where $k ≥ \max\{\Delta(G), 3\}$.

Keywords: graph coloring, equitable choosability, maximum average degree.

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