Chen, Min; Yang, Jianmin; Zhang, Hao; Wang, Yiting
Weakly entire coloring of outerplanar graphs. (Chinese. English summary) Zbl 07404497

Summary: Let $G = (V, E, F)$ be a plane graph. If $e_1$ and $e_2$ are consecutively adjacent with the same face, then we say that $e_1$ and $e_2$ are facially adjacent. A plane graph $G$ is called weakly entire $k$-colorable if there is a mapping from $V \cup E \cup F$ to $\{1, \cdots, k\}$ such that any two facially adjacent edges, adjacent vertices, adjacent faces, and any two incident elements in $V \cup E \cup F$ receive distinct colors. The weakly entire chromatic number, denoted by $\bar{\chi}_{vef}(G)$ of $G$ is defined to be the least integer $k$ such that $G$ is weakly entire $k$-colorable. In 2016, it was conjectured that every connected, loopless, bridgeless plane graph is weakly entire 7-colorable. In this paper, we prove that the conjecture is true for outerplanar graphs. Namely, outerplanar graphs are weakly entire 7-colorable.

MSC:
05C15 Coloring of graphs and hypergraphs
05C10 Planar graphs; geometric and topological aspects of graph theory

Keywords:
fan graph; outerplanar graph; weakly entire coloring; weakly entire chromatic number; maximum degree

Full Text: DOI