ON A 3-COLORING OF PLANE GRAPHS WITHOUT MONOCHROMATIC FACIAL 3-PATHS

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A facial path in a plane graph G is a subpath of the boundary walk of a face of G. The Four Color Theorem states that every plane graph contains a proper vertex 4-coloring in which each monochromatic path consists of exactly one vertex. Czap, Fabrici, and Jendroľ in 2021 conjectured that every plane graph G admits an improper vertex 3-coloring in which every monochromatic facial path in G has at most two vertices. We prove this conjecture. Our result is optimal.

References

[1] J. Czap, I. Fabrici and S. Jendroľ, *Colorings of plane graphs without long monochromatic facial paths*, Discuss. Math. Graph Theory **41** (2021) 801–808.