

1155-05-606

Wayne Goddard* (goddard@clemsn.edu), Mathematical and Statistical Sciences, Clemson University, Clemson, SC. *Fractional Versions of the Total Domatic and Idomatic Numbers of a Graph.*

The total domatic and idomatic numbers of a graph are the maximum numbers of disjoint total dominating and independent dominating sets. A fractional version of these parameters is introduced. The results focus on planar graphs. For example, every triangular disc (a planar graph with at most one region not a triangle) has fractional total domatic number at least $3/2$ and this is best possible. A planar graph has at most 4 disjoint total dominating sets, which is best possible, but its fractional total domatic number can exceed 4. A planar graph of minimum degree at least 2 has fractional idomatic number at least 2 (though there need not be 2 disjoint independent dominating sets) and so its independent domination number is at most half its order, which is sharp. We conclude with some conjectures related to the Four Color Theorem. Joint work with Michael A. Henning. (Received January 21, 2020)