Mathematics > Combinatorics

Coloring, location and domination of corona graphs

I. González Yero, D. Kuziak, A. Rondón Aguilar

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A vertex coloring of a graph G is an assignment of colors to the vertices of G such that every two adjacent vertices of G have different colors. A coloring related property of a graphs is also an assignment of colors or labels to the vertices of a graph, in which the process of labeling is done according to an extra condition. A set S of vertices of a graph G is a dominating set in G if every vertex outside of S is adjacent to at least one vertex belonging to S. A domination parameter of G is related to those structures of a graph satisfying some domination property together with other conditions on the vertices of G. In this article we study several mathematical properties related to coloring, domination and location of corona graphs. We investigate the distance-k colorings of corona graphs. Particularly, we obtain tight bounds for the distance-2 chromatic number and distance-3 chromatic number of corona graphs, throughout some relationships between the distance-k chromatic number of corona graphs and the distance-k chromatic number of its factors. Moreover, we give the exact value of the distance-k chromatic number of the corona of a path and an arbitrary graph. On the other hand, we obtain bounds for the Roman dominating number and the locating-domination number of corona graphs. We give closed formulaes for the k-domination number, the distance-k domination number, the independence domination number, the domatic number and the idomatic number of corona graphs.

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