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ON THE ROMAN DOMINATION STABLE GRAPHS

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Abstract

A Roman dominating function (or just RDF) on a graph $G = (V, E)$ is a function $f : V \longrightarrow \{0, 1, 2\}$ satisfying the condition that every vertex u for which $f(u) = 0$ is adjacent to at least one vertex v for which $f(v) = 2$. The weight of an RDF f is the value $f(V(G)) = \sum_{u \in V(G)} f(u)$. The Roman domination number of a graph G, denoted by $\gamma_R(G)$, is the minimum weight of a Roman dominating function on G. A graph G is Roman domination stable if the Roman domination number of G remains unchanged under removal of any vertex. In this paper we present upper bounds for the Roman domination number in the class of Roman domination stable graphs, improving bounds posed in [V. Samodivkin, *Roman domination in graphs: the class* $\mathcal{R}_{UVR}$, Discrete Math. Algorithms Appl. **8** (2016) 1650049].

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