

Changing and Unchanging in Roman Domination

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A Roman dominating function on a graph $G = (V, E)$ is a function $f : V(G) \rightarrow \{0, 1, 2\}$ 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 a Roman dominating function is the value $f(V(G)) = \sum_{u \in V} f(u)$. The Roman domination number, $\gamma_R(G)$, of G is the minimum weight of a Roman dominating function on G . We study the critical concept for Roman domination in graphs. In particular, we characterize:

- (1) Roman domination vertex critical trees, as well as unicyclic graphs,
- (2) Roman domination edge critical trees, as well as unicyclic graphs, and
- (3) Roman domination supper edge critical graphs. In addition, we study analogous questions of domination critical graphs for Roman domination.