

(1, 2)-Domination in Graphs

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Abstract

Given a dominating set S in a graph G , place one guard at each vertex in S . Should there be a problem at a vertex v in $V - S$, we send a guard at a vertex $u \in S$ adjacent to v to handle the problem. If for some reason this guard needs assistance, a second guard is sent from S to v , with the requirement that this second guard is at most distance two from vertex v .

Thus, a (1, 2)-dominating set in a graph $G = (V, E)$ is a set S having the property that for every vertex v in $V - S$ there is at least one vertex in S at distance 1 from v and a second vertex in S at distance at most 2 from v .

We present preliminary results about this new type of domination, relating it to other types of domination, including an **NP**-completeness result for chordal graphs and a somewhat complex, but linear, algorithm for trees.