Graph-Theoretic Parameters Related to Partial Domination

Benjamin M. Case, Todd Fenstermacher, Soumendra Ganguly*, Renu Laskar, Clemson University

For a given proportion $p \in [0, 1]$, a set $S \subseteq V$ is a $p$-dominating set if $|N[S]| \geq p|V|$. The $p$-domination number $\gamma_p(G)$ equals the minimum cardinality of a $p$-dominating set in $G$. The study of $p$-domination was introduced by Case et al. in 2017, and an open problem was presented about the relationship of $\gamma_p$ to other independence and irredundance numbers. In this paper we study the relationship of $\gamma_p$ to other graph parameters and investigate this earlier open question.

Keywords: partial domination, domination, independence, irredundance