

Dominating Distances in Graphs

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Abstract

For any given type of a set of vertices in a connected graph $G = (V, E)$, we seek to determine the smallest integers $(x, y : z)$ such that for all minimal (or maximal) sets S of the given type, where $|V| > |S| \geq 2$, every vertex $v \in V - S$ is within shortest distance at most x to a vertex $u \in S$ (called *dominating distance*), and within distance at most y to a second vertex $w \in S$ (called *secondary distance*). We also seek to determine the smallest integer z such that every vertex $u \in S$ is within distance at most z to a closest neighbor $w \in S$ (called *internal distance*). In this seminar, we will show how to determine the secondary and internal distances $(x, y : z)$ for a few types of sets, whose dominating distances are at most 2.