

On the Metric Dimension of Infinite Graphs

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Abstract

A set of vertices S *resolves* a connected graph G if every vertex is uniquely determined by its vector of distances to the vertices in S . The *metric dimension* of a graph G is the minimum cardinality of a resolving set. In this paper we undertake the metric dimension of infinite locally finite graphs, i.e., those infinite graphs such that all its vertices have finite degree. We give some necessary conditions for an infinite graph to have finite metric dimension and characterize infinite trees with finite metric dimension. We also establish some general results about the metric dimension of the Cartesian product of finite and infinite graphs, and obtain the metric dimension of the Cartesian product of several families of graphs.

Keywords: Cartesian product, graph theory, infinite graph, locally finite graph, metric dimension, resolving set.

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