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The Metric Dimension of The Subdivision Graph of The Windmill Graph K1+mK3

Metric dimension is an important concept in graph theory that measures the ability of a set of vertices to distinguish other vertices through distance. This research focuses on analyzing the metric dimension of the pinwheel subdivision graph K1+mK3, a graph consisting of one central vertex K1 connected to m copies of a triangular graph K3, where each edge of the pinwheel graph is subdivided. Subdivision is adding new vertices that enrich the graph structure and increase the complexity in calculating the metric dimension. The purpose of this study is to determine the smallest cardinality of the pinwheel subdivision graph K1+mK3 for 2≤m≤4. The type of research used is pure research involving combinatorial analysis of the distance between vertices in the graph. The results show that the metric dimension of the pinwheel subdivision graph K1+mK3 has decreased by one unit compared to the pinwheel graph that does not undergo subdivision. This finding can enrich the literature related to metric dimension in pinwheel subdivision graphs and can be applied in various problems related to robot navigation and sensor system design. Thus, this research makes an important contribution to the development of graph theory.

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