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### On the coloring of $k$ -distance graphs

Omid Khormali

[ok232700@umconnect.umt.edu](mailto:ok232700@umconnect.umt.edu)

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# On the coloring of $k$ – distance graphs

Omid Khormali

Department of Mathematical Sciences,  
University of Montana, Missoula MT, USA  
omid.khormali@umontana.edu

Graph theory is the study of the points and lines. Graphs involve the ways in which sets of points, called vertices, can be connected by lines, called edges. Many problems in different branches of science can be modeled by graphs and using the graph properties can solve them. One of these properties is coloring of graphs and different types of them are defined for graphs due to their applications. In this paper, we study the vertex coloring of particular graphs. Vertex coloring is coloring of vertices of graph such that the adjacent vertices take different colors. Suppose  $G$  is a graph with vertex set  $V(G)$  and edge set  $E(G)$ . For any  $k \in \mathbb{N}$ , the  $k$  – distance graph  $D^k G$  has the same vertex set as  $G$ , and two vertices of  $D^k G$  are adjacent if they are at distance  $k$  in the original graph  $G$ . The distance between two vertices is the number of edges between them on the shortest path. We consider the vertex coloring of  $D^k G$  and state the results for vertex chromatic number of  $D^k G$ .