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Janet Fierson* (fierson@lasalle.edu), Dept. of Mathematics and Computer Science, La Salle University, 1900 W. Olney Ave., Philadelphia, PA 19141, and **Jackson Swindells**. *Variations on coloring graphs under rainbow connection.*

Given a graph G , positive integer k , and coloring method M , there are various ways to create a k -coloring graph of G . The first two steps in the process are always the same: Identify all proper colorings of G using up to k colors under method M . Then, for each such coloring, create a vertex in the k -coloring graph of G . Different rules are possible for placing edges in the coloring graph, but a common practice is to create an edge between two vertices if and only if their corresponding colorings of G differ in a single vertex or edge.

The concept of the coloring graph had previously been investigated under the methods of vertex coloring and edge coloring. We recently presented preliminary results for the coloring graph under rainbow connection using the common practice for specifying edges described above. In this talk, we provide a more comprehensive set of results for this case and highlight the results that are unique to rainbow connection. We also consider a method with more restrictive requirements for coloring the original graph G , as well as variations on the rules for creating edges in the coloring graph. (Received September 22, 2015)