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A ranking is a vertex coloring where if two vertices have the same label any path connecting them contains a vertex with a larger label. The rank number of a graph is smallest number of colors that can be used in a ranking. Given a graph G we consider the maximum number of edges that may be added to G without changing the rank number. Here we investigate the problem for paths, cycles, complete multipartite graphs, and the union of two complete graphs joined by a single edge. For these families of graphs we provide an explicit characterization of which edges change the rank number when added to G , and which edges do not. (Received September 22, 2011)