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21851. *A Sharp Upper Bound on the k -Color Connection Number of a Graph.* Preliminary report.

How much security is needed to optimally harden a network against cyberattack? How many types of cargo need exist between a freight carrier and its destination in order to guarantee it has the most possible supplies? These problems can be phrased in terms of rainbow Ramsey theory: how many edge colors does a graph need to contain a path with k distinct colors between every pair of vertices? Equivalently, what is the k -color connection number of a graph? Denoting the k -color connection number of G as $cc_k(G)$, Coll et al. conjectured $cc_k(G) \leq 2k - 1$ and, for a sharp condition, observed that $cc_k(C_{2k-1}) = 2k - 1$. We prove $cc_k(G) \leq 2k - 1$ by analyzing the k -color connection number of chorded cycles. Additionally, we display our Mathematica package that determines the k -color connection number of chorded cycles. (Received September 21, 2016)