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Maneka Puligandla, Bayla Weick and Ruobing Zhang. *Puzzling Graphs I*. Preliminary
report.

Let G be a graph with chromatic number $\chi(G)$. A **puzzle** P on G is a partition of G into connected subgraphs. A **solution** to P is a coloring of the vertices of G using $1, 2, \dots, \chi(X)$, the chromatic number of G , such that adjacent vertices are assigned different numbers and so that the sum of the numbers assigned to each piece of the partition is the same. We say G is **puzzling** if there is a puzzle on G with a unique solution.

We investigate the concept of puzzling graphs, detailing classes of graphs that are puzzling and classes of graphs that aren't. (Received September 24, 2012)