

Magic Labelings

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This audience will be familiar with the concept of graph labeling.

Suppose G is a graph with v vertices and e edges. Consider a labeling in which the labels $1, 2, \dots, v + e$ are applied to the vertices and edges, in such a way that each number is applied exactly once. Suppose the sum of the labels on an edge and its two endpoints is the same, for every edge. Such a labeling is called *edge-magic*. Similarly, if the sum of the label on vertex x and the labels on all edges touching x equals a constant, the labeling is called *vertex-magic*. Graphs with edge-magic labelings are called edge-magic graphs, and graphs with vertex-magic labelings are called vertex-magic graphs.

In this talk we shall outline the properties of such labelings, discuss which graphs are edge-magic and which graphs are vertex-magic, and survey some related results.