

TOTALLY MAGIC INJECTIONS

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Abstract. A labelling is a mapping whose domain is some set of graph elements — the set of vertices, for example, or the set of all vertices and edges — and whose range is a set of positive integers. In particular, if the labels associated with any edge — the label on the edge itself, and those on its endpoints — always add to the same sum, the labeling, and the graph possessing it, is called *magic*. A related concept, a *vertex-magic total labeling*, is one in which the sum of the label on any vertex with the labels on the edges containing it is always constant. A labeling which has both the vertex-magic and edge-magic properties (usually with two different constants) is called *totally magic*, as is a graph possessing such a labeling. In this paper we survey what is known about totally magic graphs and an important generalization.

Key words: Magic, vertex-magic total labeling, totally magic.