New Methods for Magic Total Labelings of Graphs
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Abstract:
A vertex magic total (VMT) labeling of a graph $G = (V, E)$ is a bijection from the set of vertices and edges to the set of numbers defined by $\lambda: V \cup E \rightarrow \{1, 2, ..., |V| + |E|\}$ so that for every $x \in V$, $w(x) = \lambda(x) + \sum_{y:xy \in E} \lambda(xy) = k$, for some integer $k$. An edge magic total (EMT) labeling is a bijection from the set of vertices and edges to the set of numbers defined by $\lambda: V \cup E \rightarrow \{1, 2, ..., |V| + |E|\}$ so that for every $xy \in E$, $w(xy) = \lambda(x) + \lambda(y) + \lambda(xy) = k$, for some integer $k$. Numerous results on labelings of many families of graphs have been published. In this thesis, we include methods that expand known VMT/EMT labelings into VMT/EMT labelings of some new families of graphs, such as unions of cycles, unions of paths, cycles with chords, tadpole graphs, braid graphs, triangular belts, wheels, fans, friendships, and more.

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