

Zagreb Indices on Directed Graphs

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Zagreb indices for undirected graphs were introduced over 40 years ago. Their original development was related to uses in chemistry, but over time mathematicians have also found them to be an interesting area of study. The most known Zagreb indices are defined as follows: for a given graph G with vertex set $V(G)$ and edge set $E(G)$, define

$$M_1(G) = \sum_{v \in V(G)} (d(v))^2$$

and

$$M_2(G) = \sum_{(u,v) \in E(G)} d(u)d(v)$$

where $d(v)$ is the degree of vertex v . This talk defines and introduces Zagreb indices for directed graphs and begins to explore relationships between these various indices. In particular, we give results that parallel many of the conjectures and theorems that exist for the original Zagreb indices and produce results specific to the directed graph case.

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