The Asymmetric Index of a Graph and Families of Asymmetric Graphs

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A graph G is asymmetric if its automorphism group of vertices or edges is trivial. Any graph can be made asymmetric by removing some number r of edges and/or adding some number s of edges. We define the *asymmetric index* of a graph G, denoted $ai(G)$, to be the minimum of $r + s$ needed to transform G into an asymmetric graph. We determine the asymmetric index for various families of graphs. In addition, we investigate k- regular asymmetric Hamiltonian graphs and determine infinite families for $k = 3$ and $k = 4$. Furthermore, we show the existence of k-regular asymmetric Hamiltonian graphs for each $k > 6$.

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