Anti-reciprocal Eigenvalue Property of Graphs

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Spectral graph theory studies the relationship between the eigenvalues of matrices associated to graphs and structure of a graph. An adjacency matrix of a simple graph G is called singular if |A(G)| = 0 and non-singular otherwise and its spectrum is the collection of all of its eigenvalues. A graph G is said to satisfy property (-R)(anti-reciprocal eigenvalue property) if the negative reciprocal of each eigenvalue of A(G) is also an eigenvalue of A(G). Furthermore, if the multiplicities of each eigenvalue and its negative reciprocal are equal than the graph is said to satisfy property (-SR)(strong anti-reciprocal eigenvalue property). In this research work, different families of graphs are constructed which satisfy property (-R)or property (-SR).

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