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Graphs with Rational Normalized Adjacency Eigenvalues

If A is the adjacency matrix of a graph G and D is the diagonal matrix of vertex degrees, then the *Laplacian matrix* of G is $L = D - A$. Longstanding problems include determining which graphs have only integral adjacency eigenvalues and which have only integral Laplacian eigenvalues. The *normalized adjacency matrix* of G is $N = D^{-1/2}AD^{-1/2}$. I will show that the graphs with only integral normalized adjacency eigenvalues are graphs whose components are complete bipartite graphs, show that the analogous problem is to determine which graphs have only rational normalized adjacency eigenvalues, and present some results on trees with only normalized rational eigenvalues.