Zero Forcing Polynomial for Cycles and Singly-Chorded Cycles

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Zero forcing in a graph is an iterative process where, at each step, any colored vertex with a single uncolored neighbor forces its neighbor to become colored. We define the zero forcing polynomial of a graph G of order n by $Z(G,x) = \sum_{i=1}^{n} z(G,i)x^i$, where $z(G,i)$ is the number of zero forcing sets of G of size i. Many different graphs can have the same zero forcing polynomial; however, certain families of graphs can be recognized by their zero forcing polynomial. In this talk, we consider one such family. In particular, we show that cycles, singly-chorded cycles, for $n = 4$ the graph $2K_2$, and for $n = 6$ a graph $\mathcal{G}$ consisting of a doubly-chorded cycle with one pendant vertex share the same zero forcing polynomial and no other graphs have this same polynomial.

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