

Contextualizing Dahlhaus’s Characterization of Strongly Chordal Graphs

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A lesser-known characterization of strongly chordal graphs by Dahlhaus, Manuel, and Miller (*Discrete Math.*, 1998) is that they are the chordal graphs in which each ≥ 5 -cycle has two chords that form a triangle with an edge of the cycle. I’ll incorporate this into a natural sequence of “chordal, strongly chordal, ..., s -strongly chordal, ...” graphs. Dahlhaus’s triangles generalize to the Beineke-Pippert “2-path subgraphs” (meaning K_2 , K_3 , and the 2-trees that have at most two degree-2 vertices—equivalently, the 2-connected outerplanar strongly chordal graphs). Moreover, G. A. Dirac’s well-known 1961 characterization of chordal graphs using simplicial vertices—and extended by Chvátal, Rusu, and Sritharan (*Discrete Math.*, 2002) to the natural sequence of weakly chordal graphs—can be generalized to the same sequence of s -strongly chordal graphs by a similar use of 2-paths.

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