

Uniquely Hamiltonian Characterizations of Distance-Hereditary and Parity Graphs

Terry McKee

Wright State University

Dayton, OH

THEOREM: A graph is *distance-hereditary* (meaning that all induced paths between the same endpoints have the same length) if and only if no induced subgraph of order ≥ 5 has a unique hamiltonian cycle; this is also equivalent to every induced subgraph of order ≥ 5 having an even number of hamiltonian cycles. Restricting the induced subgraphs to those of *odd* order ≥ 5 gives similar characterizations of *parity graphs* (meaning that all induced paths between the same endpoints have the same parity). The close relationship between distance-hereditary and parity graphs is totally unsurprising, but their connection with hamiltonicity is rather unexpected.