

A Generalization of Tutte's Theorem on Hamiltonian Cycles in Planar Graphs

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In 1956, W.T. Tutte proved that a 4-connected planar graph is hamiltonian. Moreover, in 1997, D.P. Sanders extended this to the result that a 4-connected planar graph contains a hamiltonian cycle through any two of its edges. We prove that a planar graph G has a cycle containing a given subset X of its vertex set and any two prescribed edges of the subgraph of G induced by X if $|X| \geq 3$ and if X is 4-connected in G . If $X = V(G)$ then Sanders' result follows.

We also discuss the problem under which condition a 4-connected planar graph has a hamiltonian cycle through more than two specified edges.

(Joint work with F. Göring and S. Senitsch.)