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On 2-factors with long cycles in cubic graphs

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Abstract

Every 2-connected cubic graph G has a 2-factor, and much effort has gone into studying conditions that guarantee G to be Hamiltonian. We show that if G is not Hamiltonian, then G is either the Petersen graph or contains a 2-factor with a cycle of length at least 7. We also give infinite families of, respectively, 2- and 3-connected cubic graphs in which every 2-factor consists of cycles of length at most, respectively, 10 and 16.

Keywords: Cubic graph, 2-factor, long cycle, snark, infinite graph.

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O 2-faktorjih z dolgimi cikli v kubičnih grafih

Povzetek

Vsak 2-povezan kubičen graf G ima 2-faktor. Veliko truda je bilo vloženega v odkrivanje zadostnih pogojev za to, kdaj je G Hamiltonov. V članku pokažemo, da če G ni Hamiltonov, potem je G bodisi Petersenov graf bodisi vsebuje 2-faktor s ciklom dolžine vsaj 7. Poleg tega podamo neskončne družine 2-oz. 3-povezanih kubičnih grafov, v katerih vsak 2-faktor sestoji iz ciklov dolžin kvečjemu 10 oz. 16.

Ključne besede: Kubičen graf, 2-faktor, dolg cikel, snark, neskončen graf.