

1147-05-561

Zdeněk Dvořák (rakdver@iuuk.mff.cuni.cz), 11800 Prague, Czech Rep, and **Xiaolan Hu*** (xlhu@mail.ccnu.edu.cn), Wuhan, 430079, Peoples Rep of China. *Planar graphs without cycles of length 4 or 5 are $(11 : 3)$ -colorable.*

A graph G is $(a : b)$ -colorable if there exists an assignment of b -element subsets of $\{1, \dots, a\}$ to vertices of G such that sets assigned to adjacent vertices are disjoint. We show that every planar graph without cycles of length 4 or 5 is $(11 : 3)$ -colorable, a weakening of recently disproved Steinberg's conjecture. In particular, each such graph with n vertices has an independent set of size at least $\frac{3}{11}n$. (Received January 26, 2019)