Jendrol, Stanislav; **Owens, Peter J.**

On light graphs in 3-connected plane graphs without triangular or quadrangular faces. (English) Zbl 0988.05031

Graphs Comb. 17, No. 4, 659-680 (2001).

A graph H is called light in a class $\mathcal{H}$ of graphs if (i) at least one member of $\mathcal{H}$ has a subgraph isomorphic to H and (ii) there is a number $\phi = \phi(H, \mathcal{H})$ such that if $G \in \mathcal{H}$ has any subgraph isomorphic to H, then it has one whose vertices all have degree $\leq \phi$. (Thus, the statement that every three-connected planar graph has a vertex of degree ≤ 5 means that the graph consisting of a single vertex is light, with $\phi = 5$, in the class of three-connected planar graphs.)

The authors prove several results concerning graphs which are light in the classes $\mathcal{P}(3, 5)$ and $\mathcal{P}(3, = 5)$ of three-connected planar graphs in which each vertex has degree ≥ 3 and each face has size ≥ 5, respectively $= 5$. For example: (i) For each $k \geq 3$, the k-path P_k is light in $\mathcal{P}(3, 5)$, with $\phi \leq \frac{5}{3}k$. (ii) An r-cycle is light in $\mathcal{P}(3, = 5)$ if and only if r is one of 5, 8, 11 or 14.

Reviewer: Carl Droms (Harrisonburg)

MSC:

05C10	Planar graphs; geometric and topological aspects of graph theory	Cited in **1** Review
52B10	Three-dimensional polytopes	Cited in **7** Documents
05C75	Structural characterization of families of graphs	

Keywords:

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