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Summer 2011

Graph Theory: Test 7 (Monday, May 30, 2011)

Time: 20 Minutes

Name: _____

Exercise 1+2 (*total 8 points*)

Answer each of the following questions. If proofs are needed, a short sketch of the main argument is sufficient. If counterexamples are needed, it suffices to give the example (unless it is not obvious why this is a counterexample). All questions can be answered in about two lines. Each item is worth one point.

General notation: For a pair of positive integers i and j , we use $K_{i,j}$ to denote the complete bipartite graph with i vertices on one side and j vertices on the other, and K_i to denote the complete graph on i vertices.

- a) Draw a subdivision of K_5 that has 9 vertices.

- b) Write down the definition of an inflation of a graph X (an IX in Diestel's notation, MX in earlier versions).

- c) Write down the definition of a minor of a graph G .

- d) Is the following true: If G contains $K_{1,4}$ as a topological minor, then it also contains $K_{1,4}$ as a minor. If so informally explain why, otherwise give a counter example.
- e) Is the following true: If G contains $K_{1,4}$ as a minor, then it also contains $K_{1,4}$ as a topological minor. If so informally explain why, otherwise give a counter example.
- f) Give a graph H such that for any graph G the following holds: G is a forest iff H is not a minor of G .
- g) Give the statement of Kuratowski's Theorem.
- h) Explain where in the proof of Kuratowski's Theorem for 3-connected graphs (Lemma 4.4.3 in the Diestel) we use the assumption of 3-connectedness.

Feedback:

How many hours did you spend working on the assignment sheet?

The material covered last week was [] easy, [] fine, [] difficult, [] very difficult.

Comments?