HOMEWORK 8 415G 001 COMBINATORICS AND GRAPH THEORY

DUE MONDAY 11/07

Exercises

- 1. A graph G is *critical planar* if G is not planar but any subgraph obtained by removing a vertex is planar.
 - (a) Are K_5 , $K_{3,3}$ and the Petersen graph P critical planar?.
 - (b) Prove that critical planar graphs must be connected and cannot have a vertex whose removal disconnects the graph.
- **2.** Exercise 3.14.
- 3. For what values of n can we visit all the squares of an $n \times n$ chessboard in a cycle (the only square that is repeated is the first-last square) if we are only allowed to move to adjacent squares (front, back, left and right moves)? For those possible values of n exhibit such a cycle.
- 4. For the following graphs exhibit a hamiltonian cycle if the graph is hamiltonian, otherwise prove that there cannot be such a cycle.



5. Exercise 4.7.

Suggested exercises

From the book. 3.13, 3.15, 3.16, 4.1, 4.2(a), 4.3(a), 4.6