# 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

