MATH 3790 - Assignment 4

Due Nov 27

November 19, 2003

1. Given a graph G with n vertices, prove that if $d(v) \geq \frac{n}{2}$ for all $v \in V(G)$ then G is connected.

2. Prove that K_5 is not planar.

3. A graph G is said to have an *Euler walk* from u to v if there is a walk from u to v which uses every edge of G exactly once. Characterize all graphs which contain an Euler walk.

4. The game of Clobber is played on a 6x7 checkerboard with alternating black and white pieces. On each player's turn they move a piece of their colour one space horizontally or vertically onto a space which must contain a piece of the opposite colour. This piece is 'clobbered' and removed from the board (being replaced by the one that moved). When a player cannot make a legal move, they lose. Find out as much as possible about this game. (This problem will be worth twice that of the others)

5. (Bonus) Given a graph G with n vertices, what is the maximum number of edges G can have if there are no three vertices which are mutually adjacent (ie no triangles)?