Due: 2011/11/30 before class

Homework 9

Problem 1. *Let $g = 2k > 2$ be an even number. Prove that, if a graph G has minimum degree $d > 2$ and girth g, there it has at least $2((d-1)^k - 1)/(d-2)$ vertices. (Hint: Start from two adjacent vertices.)*

Problem 2. *Find a graph with minimum degree 3, girth 6, and exactly 14 vertices. Briefly justify your answer. (Hint: Construct a graph from the Fano configuration.)*

Problem 3. *If G is a graph on n vertices and does not contain C_4, then G has at most $n(1 + \sqrt{4n-3})/4$ edges. (Hint: Count the number of (a, b, c) such that $a \sim b$ and $b \sim c$.)*