

Math 5405 - Fall 2007
Homework # 1
Due September 6, 2007

Directions: You are expected to do your own work, consulting with other students is acceptable, but the work turned in must be your own. Be sure to show all work!!

1. Let G be an r -regular graph with girth at least 4. Prove that G has at least $2r$ vertices. Determine all such graphs with exactly $2r$ vertices.
2. Decompose the Petersen graph into three connected subgraphs that are pairwise isomorphic. Also decompose the Petersen graph into copies of P_4 .
3. Prove that every graph with n vertices and at least n edges contains a cycle.

Do 2 out of the following 3 problems:

4. #1.1.38
5. #1.2.22
6. #1.2.26