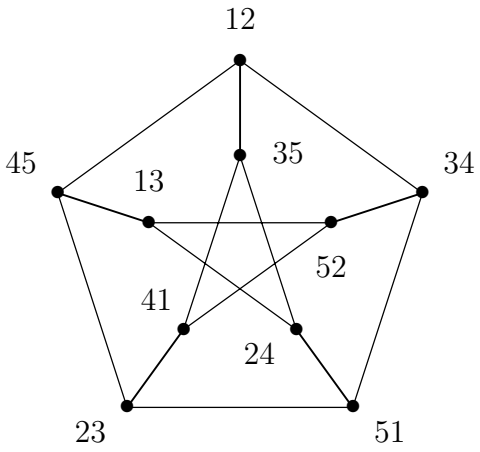
Math 485 Homework 1
Fall 2007
Due: Friday, September 7

In all the problems, indicate how you arrived at your answer. The answer alone will get only partial credit.

1. In class we discussed the Petersen graph:



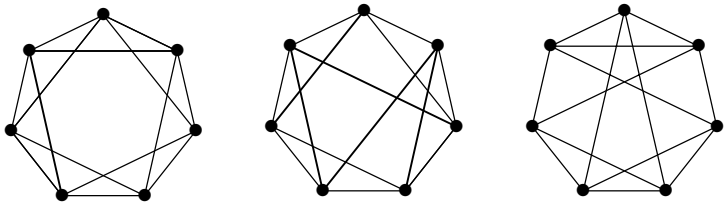
   (a) Find the largest size of a clique in the Petersen graph.
   (b) Find the largest size of an independent set in the Petersen graph.
   (c) What is the chromatic number of the Petersen graph?

2. Prove that the Petersen graph has no cycle of length 7.

3. Show that a simple graph with at least two vertices has two vertices of the same degree.

4. Prove that every group of exactly six people contains (at least) three mutual acquaintances or three mutual strangers.

5. Determine which of the following graphs are isomorphic.



6. Prove that if a graph contains exactly two vertices of odd degree, then it contains a path joining those two vertices.