WRITTEN ASSIGNMENT # 12
MATH 38
DUE: MONDAY, MAY 2, 2005

Read Section 3.1

1. Is it possible for a tree to have more than one perfect matching?

2. Is it true that every graph of order 4 has a perfect matching?

3. Define a vertex cover and illustrate this concept on the graphs on Exercise 3.1.1.

4. Determine the minimum size of a maximal matching in a cycle C_n for all n.

5. What is the minimum size of an edge cover in the cycle?

6. What can you say about matchings and vertex covers in a bipartite graph? Give an example that illustrates Theorem 3.1.16 different from the one in the book.

7. Give an outline of the proof of Theorem 3.1.16.

8. Write a table with column 1 containing: $\alpha(G)$, $\alpha'(G)$, $\beta(G)$ and $\beta'(G)$, column 2: containing the definition for each of these symbols. Compute $\alpha(G)$, $\alpha'(G)$, $\beta(G)$ and $\beta'(G)$ for the Petersen graph.

9. In Page 115 relations between $\alpha(G)$, $\alpha'(G)$, $\beta(G)$ and $\beta'(G)$ are described, state all of these relationships.

10. Is it true that every vertex cover contains a minimum vertex cover?