

MTH 548 Graph Theory Final Exam Fall 2003

This is a take home exam. Due date: **Dec 17**. Do not work with anyone else on this exam. Don't get the solutions from any written source. You can ask me for hints if you need to. You are to solve each problem from basic definitions and techniques. The topics are taken from those given in the student presentations. You can get notes from the presenters and/or read up on the basic definitions in one of the text books.

1. If G is Eulerian, show that $L(G)$, the line graph of G , is both Hamiltonian and Eulerian.
2. Prove that $R(3, 4) = 9$.
3. (a) Name a graph with $\chi = 4$ and no K_3 subgraph.
(b) Find a graph G such that $\chi(G) = \omega(G)$ but G is not perfect.
4. Find the exact crossing number of K_6 .
5. Figure out minimum n such that K_n is not embeddable on the torus.
6. Find the characteristic polynomial for the adjacency matrix of $K_{n,m}$. What are the eigenvalues of $K_{n,m}$?