

WRITTEN ASSIGNMENT # 18

MATH 38

DUE: MONDAY, MAY 21, 2005

Read 6.1, 6.2 and 6.3

1. What do we mean when we say that a graph G can be "embedded" on a surface?
2. Define a dual graph and illustrate this concept for C_n and a tree T with n vertices.
3. What is the difference between planar and outerplanar? Give an example to illustrate this difference.
4. What is Euler's formula? How is this identity proved in your book? What other method can we use to prove this identity?
5. In class we proved that for any planar graph we must have that $e(G) \leq n(G) - 6$. Prove that if you have the additional information that there are no triangles in the graph the bound must be $e(G) \leq 2n(G) - 4$.
6. State Kuratowski's characterization of planar graphs?
7. What are the parameters that we used to measure the unplanarity of a graph G ?
8. How is the chromatic number related to planar graphs?
9. What are bounds for the thickness and the crossing numbers of a graph?
10. How does Euler's formula generalize for surfaces of genus g ?