Homework Assignment #1

Math 5520, Winter 2006

Due Friday January 13

1. Read the preface (pp. vii-x) and §1 (pp. 1-11) of the text.

2. Complete the classification of regular polyhedra begun in class as follows. For each possible value of

a = # edges per face, and
b = # edges per vertex

compute V, E, F and if Euler's formula $V-E+F=2$ is satisfied, find the name of the polyhedron in Fig. 1.9. Otherwise state that no such polyhedron exists.

	$a=3$	$a=4$	$a=5$	$a=6$
$b=3$	$\frac{1}{E}=\frac{1}{a}+\frac{1}{b}-\frac{1}{2}=\frac{1}{6}$ $E=6, V=4=F$ Tetrahedron			$\frac{1}{E}=\frac{1}{6}+\frac{1}{3}-\frac{1}{2}=0$ Impossible.
$b=4$				
$b=5$				
$b=6$				

3. Problem #10 on page 11. Can you see a geometric explanation of this duality.

4. Compote the Euler characteristics of the complexes in Fig. 1.3 (p. 4).