Name: _____ MA 466 A3

Homework 1 50 points Due: 16 Jan 09

INSTRUCTIONS: This is a graded assignment. Each person must submit their own solution. Document your assistance in accordance with (IAW) the Documentation of Written Work (DOWW). These problems are due at the beginning of class on 16 Jan.

1. Write down all the symmetries of a square. You should get 8 of them.
2. Write down the "multiplication table" for these symmetries.
3. What properties do these symmetries satisfy? Do they satisfy all of the properties discussed in class?
4. What is the "fundamental information" for these symmetries, i.e. the least you could know about it and still list all of the symmetries? Use the "generators-relates" format discussed in class.
5. List the symmetries of a regular pentagon and then of a regular hexagon. Could you predict the generators of these sets of symmetries?
6. Look closely at the generators and relations for the group of symmetries of the triangle. Could you predict what the groups of symmetries of a regular pentagon or hexagon will be? Write down your guess using generators and relations.
7. Consider the regular n-gon, i.e. a polygon having n sides of the same length, where n is a positive integer. What rotations are symmetries of the n-gon? What is the smallest rotation that yields a symmetry?
8. List all symmetries of the n-gon. Can you describe this group using generators and relations? (Make a guess based on the previous questions.)
9. How many symmetries are there of a cube?