MATH 579: Combinatorics
Homework 11: Due Dec.11

For all of the below coloring problems, there are m colors to choose from. Your answers should all be polynomials in m.

1. Count the number of edge colorings of a square, up to rotation. Give them all explicitly for $m = 2$.

2. Count the number of edge colorings of a square, up to rotation and reflection. Give them all explicitly for $m = 2$.

3. Count the number of vertex colorings of a tetrahedron, up to rotation and reflection.

4. Count the number of face colorings of a tetrahedron, up to rotation and reflection.

5. Count the number of vertex colorings of a tetrahedron, up to rotation.

6. Count the number of face colorings of a tetrahedron, up to rotation.

7. Count the number of vertex colorings of the three graphs in problem 7 of the previous homework set (3 parts), up to graph automorphism.

8. Count the number of edge colorings of the three graphs in problem 7 of the previous homework set (3 parts), up to graph automorphism.

9. Count the number of edge colorings of a tetrahedron, up to rotation.

10. Count the number of edge colorings of a tetrahedron, up to rotation and reflection.

11. Count the number of vertex colorings of a cube, up to rotation.

12. Count the number of face colorings of a cube, up to rotation.

13. Count the number of edge colorings of a cube, up to rotation.