Math 10270 : Quiz 2

1. (5 points) Describe geometrically the symmetries of the equilateral triangle below represented by the permutations:

$$P = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{pmatrix}; \qquad Q = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix}.$$

Describe also the symmetries PQ and QP both algebraically and geometrically. (To describe a symmetry geometrically label an axis of reflection or give an angle of rotation.)

2. (5 points) Draw hexagons with symmetry groups of order 1, 2 and 4. Describe the symmetries.