MAT 360: HOMEWORK 7
DUE WED, OCT 28

In all the problems that ask you to describe an isomoetry, you need to specify what kind of isometry it is and give a full descripiton (if rotation, with what center and by what angle? if reflection, across which line?)

1. Let R be rotation by angle α around point A.
    (a) Describe SRS, where S is the reflection across a line l containing A
    (b) Describe TRT^{-1}, where T is a translation.

2. Let C_A be the central symmetry (i.e. $180°$ rotation) around point A. Describe the composition $C_A C_B$, where A, B are two distinct points.

3. Consider the square $ABCD$ (vertices are labeled clockwise).
    (a) What is the composition $CAC_B C_C C_D$?
    (b) What is the composition $R_A R_B R_C R_D$, where R_A is $90°$ counterclockwise rotation around A, and similarly for B, C, D.

4. A symmetry of a figure X is an isometry f such that $f(X) = X$.
    Describe all symmetries of a regular n-gon.

5. Describe all symmetries of the pattern on the next page (asuuming it is continued infinitely, filling the whole plane). Symmetries must respect colors.
    For translations, draw the translation vectors on the pattern.
    For rotations, mark the rotation centers and indicate the rotation angles.
    For reflections/glide reflections, draw the reflection and vector on the pattern.
    If you prefer, you can print several copies of the pattern and mark different kinds of symmetries on different copies.