CSCI 4250/5250 Fall 2011 Name _____
Homework 8 (Due: beginning of class, Monday Oct 24th)

1. Transformation applied to points
    a. Write out the following 4x4 matrices and label each with the following names:
    T0: Translate in x by 4 and in y by 3
    R: Rotate about the z axis by pi/4 (45 degrees)
    T1: Translate in x by -4 and in y by -3
    S: Scale in x by a factor of 2 and y by a factor of 4 (z is unchanged)

    b. Assume you have an object you want to rotate by pi/4 around a z-axis centered at (4, 3, 0). Using the symbols T0, R, and T1, show the correct order of composition of these matrices to perform the desired rotation.

    c. Find the composite matrix M by multiply out your answer from question 1.b.

    d. Apply the transformation matrix M to the 3D point P=(7, 5, 7) to find the transformed point Q by multiply it out.

2. Coordinate Transformation
    a. Assume you have an object you want to rotate by pi/4 around a z-axis centered at (4, 3, 0). How should the coordinate system be transformed? Compute the Current Transformation (CT) matrix as a result of that transformation.

    b. For a 3D point P'=(4, 3, 4) in the transformed coordinate system, what is its coordinates in the original coordinate system?

< you may use Matlab or other software for the matrix computations>

3. Read the handout on Display Lists