CS552: Computer Graphics
Home Assignment (2D Transformation)

1. Perform 45^o rotation of a triangle $A(0,0)$, $B(1,1)$, and $C(5,2)$ (a) about the origin and (b) about $P(-1,-1)$.

2. Magnify a triangle with vertices $A(0,0)$, $B(1,1)$, and $C(5,2)$ to twice its size while keeping $C(5,2)$ fixed.

3. Find the form of the matrix for reflection about a line L with slope m and y intercept $(0,b)$.

4. Show that the order in which the transformations are performed is important by the transformation of the triangle $A(1,0)$, $B(0,1)$, and $C(1,1)$, by (a) rotating 45^o about the origin and then translating the the direction of vector $\mathbf{I}$ and (b) translating and then rotating.

5. Prove that $2D$ rotation and scaling commute if $s_x = s_y$ or if $\theta = n\pi$ for integral n, and that otherwise not.