Suggested problems

Special transformations

P1: Write the matrix that represents the transformation:

(a) Counterclockwise rotation through an angle of $\frac{2\pi}{3}$.
(b) Clockwise rotation through an angle of $\frac{3\pi}{4}$.
(c) Dilation by a factor of 5.
(d) Contraction by a factor of 5.

P2: While you’re at it, jot down the matrices for reflection about the x-axis, the y-axis, and the origin, just so you have them in front of you.

P3: Take the unit square and (1) reflect is across the x-axis, (2) rotate it clockwise through an angle of $\frac{3\pi}{4}$, and (3) dilate by a factor of 5. Give the matrix for the composite transformation, the transformed vertices, and sketch the new shape.

P4: Take the polygon shown below, and (1) rotate counterclockwise through an angle of $\frac{2\pi}{3}$, and (2) reflect across the origin. Give the matrix for the composite transformation, the transformed vertices, and sketch the new shape.