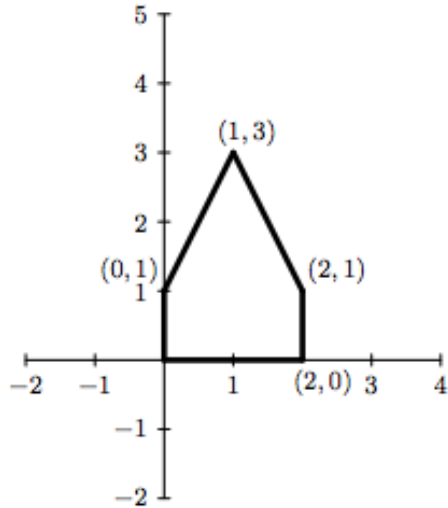# Math 300 Section 3.1 Additional Problems

1. Suppose you want to scale the shape below by a factor of 4 in the horizontal direction and a factor of 2 in the vertical direction and then translate the shape so that the lower left corner is at the point $(1,3)$. You want to do this using homogeneous coordinates and matrix transformations.

a) What are the homogeneous coordinates of each vertex? The edges of the shape connect which vertices?

b) What matrix do you need to use to compute the homogeneous coordinates of the vertices of the scaled shape using matrix multiplication? Compute these homogeneous coordinates.

c) What matrix do you need to use to now compute the homogeneous coordinates of these "scaled vertices after the translation using matrix multiplication? Compute these homogeneous coordinates.

d) Sketch the image of the shape at the end of this process.