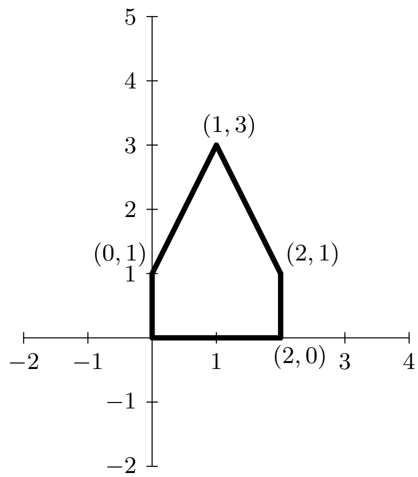
Additional Suggested HW for Section 3.2

1. (a) In the additional homework for Section 3.1, you came up with a sequence of matrix transformations that when applied to the homogeneous coordinates of the vertices scaled the shape below by a factor of 4 in the horizontal direction and a factor of 2 in the vertical direction and then translated the shape so that the lower left corner was at the point $(1, 3)$. Now find a single matrix C such that the transformation $T : \mathbb{R}^3 \to \mathbb{R}^3$ defined by $T(X) = CX$ computes the final homogeneous coordinates from the initial homogeneous coordinates (i.e. do all your transforming with one matrix multiplication instead of 2).



   (b) Notice that if you put the homogenous coordinates of the vertices as columns in a matrix D, then the columns of CD give you the homogenous coordinates of the vertices under the transformation $T : \mathbb{R}^3 \to \mathbb{R}^3$ defined by $T(X) = CX$ since $C[D_1, D_2, \ldots, D_p] = [CD_1, CD_2, \ldots, CD_p]$. Use this fact to compute the homogenous coordinates of the vertices of the shape after the transformation all at once and sketch the final image.