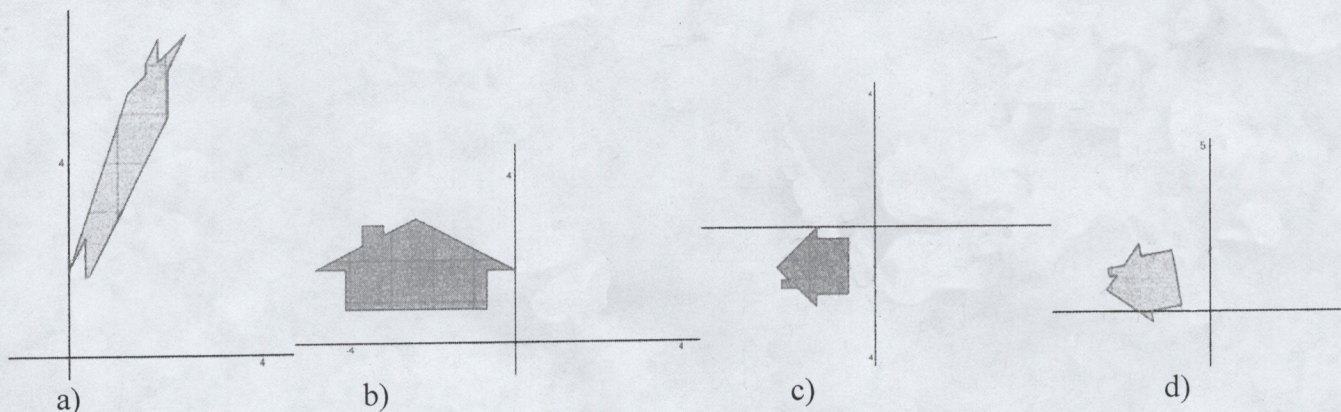


1. Write a matrix that would turn the original house in the 1st quadrant into its new image. In some cases you might have to make some approximations which is fine. As long as you're close you'll get full credit. [3 each]



a) _____ b) _____ c) _____ d) _____

- e. Write a matrix that would map every point on the house to a point on the line that passes through the origin and (4, -3) [3]

2. Perform the operation $(2 + 5i)(3 - 2i)$ using matrices. Show how your answer can be converted back into $a + bi$ form. [3]

4. Below are generators for two different groups. For each, state i) the transformation(s) represented by the matrix (or matrices); ii) the order (size) of the group and iii) a different group that it is isomorphic to. [12 total] [4 each]

a) $\begin{bmatrix} \cos 20^\circ & -\sin 20^\circ \\ \sin 20^\circ & \cos 20^\circ \end{bmatrix}$ i) _____ ii) _____
iii) _____

b) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ and $\begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$

i) _____ and _____ ii) _____

iii) _____

5. Express the following as a composition of 2 common matrix transformations. (make sure your order is correct) [4]

$$M = \begin{bmatrix} -\cos 50^\circ & -\sin 50^\circ \\ -\sin 50^\circ & \cos 50^\circ \end{bmatrix}$$

$$M = \underline{\hspace{10em}}$$