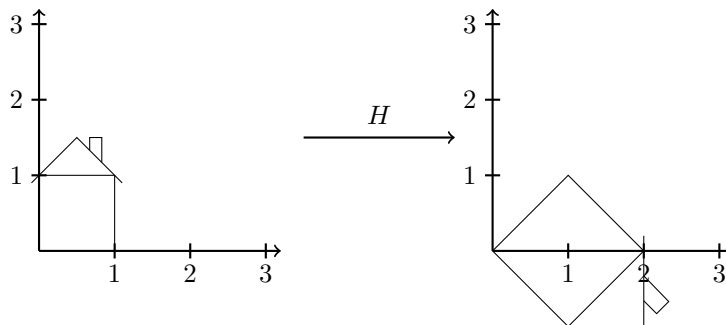
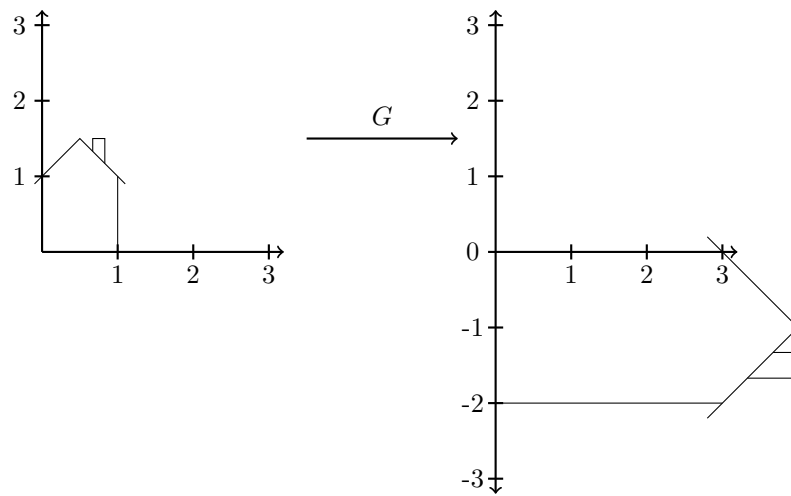
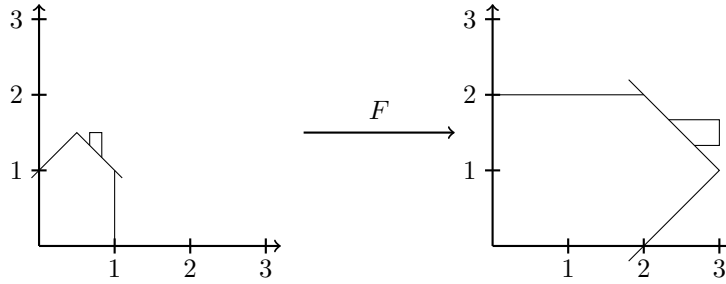


MTH 309 - Activity 5
Linear Transformations

1. For each of the following, describe in words what the effect of the linear transformation is.



2. For each of the above, where does the transformation send each of the following?

- i. $(1,0)$
- ii. $(0,1)$
- iii. $(2,3)$
- iv. $(-5,7)$
- v. (x,y)

3. Describe algebraically (with an equation) what the above transformations do to an input vector.
4. Which of the following are linear transformations?
 - (a) $R(x, y, z) = (3x - 2y, x + y + z, y - z, x)$
 - (b) $S(x, y, z) = (x - 1, y + 2, z - 6)$
 - (c) $T(x, y, z) = xyz$
 - (d) $U(x, y, z) = (x, x, x, y, y, y, z, z, z)$
5. Find the matrix representation for all the linear transformations in this activity. For F , G , and H , what is the relationship between your calculated matrix representations and the pictures of the transformed houses?