1. Express the transformation that maps the “F” on the left to the “F” on the right, in the form $A(x) = M \vec{x} + \vec{u}$, where $M$ is a 2x2 matrix and $\vec{u} \in \mathbb{R}^2$.

**ANSWER:** $A(x) = \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix} + \begin{pmatrix} 2 \\ 1 \end{pmatrix}$.

2. Give a 3x3 homogeneous matrix that represents the inverse of the above transformation.

**ANSWER:** \[
\begin{pmatrix}
0 & -1 & 1 \\
-1 & 0 & 2 \\
0 & 0 & 1
\end{pmatrix}
\] See the answers to homework #1 for a general method for answering this kind of problem.

3. Give a sequence of (pseudo) OpenGL commands that will draw the “F” in the position shown on the right, given a routine `drawF()` that draws the “F” in the position shown on the left. You should use commands chosen from among the following: `drawF()`, `glLoadIdentity()`, `glMatrixMode()`, `glScalef()`, `glTranslatef()`, `glRotatef()`.

**ANSWER:**
```
    glMatrixMode( GL_MODELVIEW );
    glLoadIdentity();
    glTranslatef( 2, 1 );
    glRotatef( 90.0 );  // 90 degrees
    glScalef( -1, 1 );
    drawF();
```