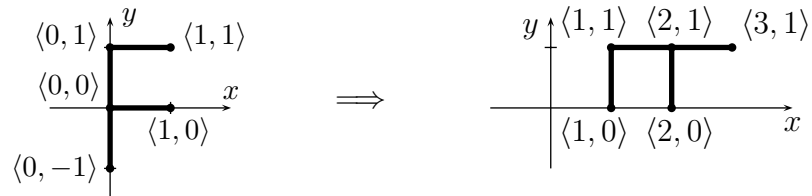Name: Student ID:

CSE 167 - Intro to Computer Graphics - Fall 2003

ANSWERS: Quiz #1 — October 21

You must show your work in order to get credit for a problem. Label your answers clearly.

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

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()`, `pglScalef()`, `pglTranslatef()`, `pglRotatef()`.

ANSWER:
```
glMatrixMode( GL_MODELVIEW );
glLoadIdentity();
pglTranslatef( 2, 1 );
pglRotatef( 90.0 );   // 90 degrees
pglScalef( -1, 1 );
drawF();
```