CS 130, Homework 3

Name: _____   ID: _____

Problem 1

What problem is a z-buffer intended to solve?

Problem 2

OpenGL provides direct support for transmitting triangles (**GL_TRIANGLE**) and lines (**GL_LINE**) to be rendered, but it also provides more complex options such as **GL_TRIANGLE_STRIP** and **GL_LINE_LOOP**, which do not provide functionality that cannot already be achieved with **GL_TRIANGLE** and **GL_LINE**. What role do these more complex options serve?

Problem 3

Express the **(2D) operator** $\begin{pmatrix} 1 & -1 \\ 1 & 1 \end{pmatrix}$ as a composition of simpler operations: rotations, translations, scales.

Problem 4

Devise a transform, written as a product of homogeneous translation, rotation, and scale matrices, which will transform the points $(-1, -1)$, $(0, 0)$, $(1, -1)$ into the points $(-1, -1)$, $(-2, 2)$, $(1, 1)$.

Problem 5

In the second lab, you drew lines with DDA. In doing this, you compared the slope of the line with 1. What is significant about 1? Why not 2, 3, or $\frac{1}{2}$?