Sample Test: OGL and Math Basics

January 22, 2023

– State any simple, reasonable assumption used to arrive at your answer.
– A 'yes' or 'no' answer without reasoning is worth 0 points.
– Zero points if the writing is hard to decipher. Use a black pen if in doubt.
– Indicate with arrow if you use the back of the previous page (last page for page 1).

1 OpenGL

1. (1 pt) What is the advantage of vector graphics over raster graphics?

2. (1 pt) Why are shaders not compiled at the same time as the main OpenGL program?

3. (1 pt) How is the required OpenGL version indicated in a shader program?

4. (1 pt) What does a *VertexShader* typically output?

5. (1 pt) Give a short definition of the OpenGL terms: *deprecated* and *uniform*.

2 Basic Math

1. (2 pts) Rotate the planar triangle

$$\left[\begin{smallmatrix}0\\1\end{smallmatrix}\right], \left[\begin{smallmatrix}0\\0\end{smallmatrix}\right], \left[\begin{smallmatrix}1\\0\end{smallmatrix}\right]$$

by $\pi/4$ in counter-clockwise direction about the origin. Give the new coordinates. Give the rotation matrix.

2. (1 pt) Determine the normal to the triangle with vertices

$$\left[\begin{smallmatrix}0\\1\\1\end{smallmatrix}\right], \left[\begin{smallmatrix}0\\0\\0\end{smallmatrix}\right], \left[\begin{smallmatrix}1\\0\\1\end{smallmatrix}\right].$$