Name: _____ **Student ID:** _____

Write your answers in the spaces provided.

No aids (books, notes, calculators, mobile phones, PDA's, music players, other electronic devices, etc.) are permitted.

1) Write down how to test if a 2D point (x, y) is inside the triangle with vertices (x_0, y_0), (x_1, y_1), and (x_2, y_2).

2) Give an **explicit** description of the circle with centre $(0, 0)$ and radius 1.

3) How do you use barycentric coordinates to linearly interpolate colour across a triangle?

Name: _____ **Student ID:** _____

4) Describe how translation transformations can be implemented with matrix multiplication.

5) Determine a model-view transformation corresponding to a camera with world space coordinates $(0, -3, 3)$ pointing at the origin of world space. You can express this as a sequence of named transformations (e.g. rotate around this axis by this angle) or if you prefer as a 4×4 matrix.

6) Write down an expression for a unit-length vector orthogonal to a triangle with vertices (x_0, y_0), (x_1, y_1), and (x_2, y_2).

Name: _____ **Student ID:** _____

7) Write down how camera x and y coordinates are transformed in a perspective projection.

8) How could you make a perspective view frustum as close as possible to a given orthographic view volume? (in terms of field of view etc.)

9) Why do we clip triangles against the near clipping pane before rasterization?

Name: _____ **Student ID:** _____

10) Write down pseudocode for the Z-buffer algorithm.