CS4731 - C '98 - Final Exam

Name:
Login ID (4 pts):

Read questions carefully before answering. Do not hesitate to ask for clarification. Show all work. Partial credits are given, so do not leave anything blank! Use the back of the pages or extra paper as needed. Good luck!

1. (12 pts) In area subdivision hidden surface removal, one of the termination cases is when the nearest polygon contains the entire subimage. Describe an algorithm for determining when a rectangle is completely contained within a polygon.

2. (12 pts) Prove analytically that moving the camera further behind the plane of projection results in objects appearing larger when projected.

3. (12 pts) Briefly describe two differences between the Bezier and the Hermite parametric curve.

4. (12 pts) List the components of the Phong Specular Reflection Equation which could be randomly perturbed to get a textured effect on the surface.

5. (12 pts) Define or briefly describe the following terms or techniques.

Up vector

Sutherland-Hodgeman clipping

Plane of projection

6. (12 pts) Show the 3-D Homogeneous Coordinate Transformation matrices for the **INVERSES** of the following transformations:
a. translate by (10, 20, 30)
b. scale x by 2 and y by 3
c. rotate 10 degrees about the x axis

7. (12 pts) Under what circumstance would you perform clipping in a scene which you are about to render via **ray tracing**? Under what circumstance would you not perform clipping prior to ray tracing?

8. (12 pts) Describe a color space other than RGB (red/green/blue) space and indicate when or why you would use this space rather than RGB for color specification.