CS4731 - A '99 - Final Exam

Name:
Login ID:

Please answer 6 of the first 7 questions (cross out the one you don't want us to grade) and question 8. 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. (16 pts) Sketch two distinct configurations of polygons that cannot be rendered using depth sorting without first clipping the polygons against each other.

2. (16 pts) Describe how you would ray trace a scene composed of boxes. Please give equations and an overview of the algorithm you'd use.

3. (16 pts) Give an example of a shearing transformation matrix and show the effect of applying this transformation on the triangle (-1, -1), (1, -1), (0, 1).

4. (16 pts) Define the following terms as they apply towards color specification.

- Hue
- Saturation
- Tint
- Brightness

5. (16 pts) Describe how the scan-line polygon filling algorithm could be simplified if you knew that only triangles were to be rendered.

6. (16 pts) Describe three aspects of the Phong Reflection Model that are simplifications or approximations of how light actually interacts with surfaces.

7. (16 pts) If the View Reference Point is at (1, 1, 1) and the Look-at Point is at (-1, -1, 0) and the approximate Up Vector is (0 1 0), what are the U, V, and N vectors (numeric)? Note, you don't have to normalize the vectors.

8. (4 pts) Suggest a theme for next year's graphics projects.