CS4731- A Term '99 - Midterm Exam

Name:

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. (15 pts) Given a model of a 3-D box, describe how you would modify the model to impart a twist along the vertical axis. Be sure to address the situation where the total twist exceeds 360 degrees.

2. (15 pts) Calculate the transformation matrix necessary to scale points by a factor of 2 in x, 3 in y, and 4 in z, with the center of scaling being the point (5, 10, 15).

3. (20 pts) Describe a computer application that might employ all 5 logical input device classes. Give examples of operations within the application that could be reasonably implemented with an input device from each of the classes.

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4. (20 pts) Give examples of each of the following:

a. The analytic equation of a 2-D line.

b. The parametric equation(s) for a 2-D line.

c. The analytic equation of a 3-D surface (any surface will do).

d. The parametric equation(s) of a 3-D surface.

5. (15 pts) Describe and give equations for clipping an arbitrary edge against a **circular** viewport, centered at the origin and with radius 1.0.

6. (15 pts) Describe 3 ways of creating a "bad" visualization of a data set.