ECS 175 – Computer Graphics

Sample Examination

NAME __________________________________________________________

Directions:

All answers are to be written on the paper provided. Do all problems.

Problems:

1. What values are necessary to specify a plane in 3-dimensional space? Given a point P, how do I determine if P is a point on a given plane?

2. What is Gouraud Shading?

3. Outline the construction of a Transformation T whose action is to rotate an entity an angle of 30 degrees about the axis specified by the vector <0, -1, -1> and the point (-3, 6, -3). No matrices please, but be specific about the rotation angles.

4. Given the points (0,0), (0,1), (4,3), and (4,0), let P(t) be the Bezier curve defined by these control points. What is P(.5)? Explain how you obtained your answer.

5. What 3-dimensional-space line corresponds to the projective space line segment with endpoints (6, -4, -2, -2) and (3, 4, 2, -1)?

6. The matrix

$$
\begin{pmatrix}
2 & 0 & 0 & 0 \\
0 & 2 & 0 & 0 \\
0 & 0 & 2 & 0 \\
0 & 0 & 1 & 2 \\
\end{pmatrix}
$$

corresponds to what geometric transformation?

The two polygons A and B intersect. Outline a procedure that will determine the endpoints of the line of intersection of A and B.
7. What is the basic difference between the z-buffer and ray-tracing algorithms?