

Sign the exam with your student number - not your name _____

1. (30 pts) The standard lighting/reflection model is composed of three terms: ambient, diffuse, and specular.
 1. What is ambient reflected light and how is it modeled?
 2. What is diffuse reflected light and how is it modeled?
 3. What is specular reflected light and how is it modeled?

2. (30 pts) Gouraud shading blends the reflected light computed at polygon vertices to paint interior pixels. Explain this process in general. Explain how coherence is used to make the process efficient.

3. (30 pts) Back-face culling is used to increase the efficiency of rendering closed solid polygonal meshes.
1. A polygon has two sides or *faces*. Describe a convention that can be used to define a polygon in terms of its vertices that allows one to distinguish a *front face* from a *back face*.
 2. Given an camera (eye) position $e = (e_x, e_y, e_z)$ and a polygon defined using your convention, show how to easily determine if the camera sees the front or back face of the polygon.
 3. Estimate the efficiency of back-face culling.
 4. Does back-face culling solve the hidden surface problem? Why or why not?

4. (10 pts) Describe the one thing you know best about computer graphics that was not covered in the previous questions.