Name: _____   **Student ID:** _____

This is just a practice for the second midterm. Were this a real exam, you would not be allowed any aids (books, notes, etc.), there would be twelve questions, and you would have to write your answers in the spaces provided.

1) Given a point with pixel coordinates (p, q) in an $m \times n$ image, construct the camera space ray through the pixel for a perspective projection specified in the usual way (left, right, bottom, top, near, far).

2) Give pseudo-code for checking if a ray with origin $\vec{x}_0$ and direction $\vec{d}$ intersects a plane containing point $\vec{p}$ with normal $\hat{n}$.

3) How can you compute the barycentric coordinates of the intersection of a ray with a triangle?

Name: _____   **Student ID:** _____

4) Give recursive pseudo-code for efficiently intersecting a ray with a large set of primitive shapes organized in a BVH.

5) In what sense can raycasting have better asymptotic performance than Z-buffer rasterization?

6) Give recursive pseudo-code for efficiently determining if any of a large set of primitive shapes organized in a BVH intersect each other.