

## Midterm Sample Questions

October 09 2007

1. Derive the equation of a plane that passes through point  $P_0$  and has normal  $n$ .
2. Derive the equation of a plane that passes through 3 points  $P_0$ ,  $P_1$ , and  $P_2$ .
3. Compute the distance from a point  $P$  and a plane  $(P_0, n)$ .
4. Compute the distance from a point  $P$  to a line that passes through 2 points  $P_0$  and  $P_1$ .
5. Rasterize a 2D circle.
6. Rasterize a 2D discus.
7. Rasterize a convex 2D n-gon.
8. You are given a black box renderer. How can you find out whether it does screen space or model space color interpolation (or neither)?
9. Describe a method for wire frame rendering that does not show hidden wires (triangle edges).
10. Derive the planar pinhole camera projection equations.
11. Describe a method for changing the resolution of a planar pinhole camera.
12. Describe a method for changing the field of view of a planar pinhole camera.
13. You are given a planar pinhole camera  $PPHC_0$  and its image  $I_0$ . Describe a method for panning and tilting the camera w/o knowing the scene geometry.
14. You collect a set of planar pinhole camera and image pairs by rendering a scene from a point  $O$  by panning and tilting the camera to cover all directions. Describe a technique for letting the user explore the scene interactively from the point  $O$  using the set of camera-image pairs.
15. You acquire digital video of a friend standing in front of a blue screen and talking. Describe a technique for inserting your friend in your graphics application using texture mapping.
16. Describe a simple technique for approximate transparency rendering.
17. Describe a simple technique for approximate iridescent rendering (i.e. insect).
18. Describe a simple technique for approximate reflection rendering.