Lecture 4: Rasterization – Review Questions

- CRT displays have a nonlinear response function. In other words, the function relating input voltage to output intensities is nonlinear. Make a sketch of what this function looks like.

- More modern display technologies mimic this behavior. Explain why. The response of the human visual system should be part of your argument. Use additional plots or figures to make your point.

- What is gamma correction? When might we need to gamma-correct an input image? What is the formula for gamma correcting an input image?

- Suppose you create an image using a very accurate physical model of light transport. Would you want to gamma correct that image for display? Explain why or why not.

- What is alpha blending? Give all OpenGL functions that must be called to set up alpha blending. Give pseudocode for the following scenarios:
    - Blend half of one image with half of another
    - Blend three images equally
    - Create a billboard using a visibility mask
    - Render three translucent polygons

- For the last scenario above, in what order should the polygons be rendered? Explain your answer. If it doesn't matter, explain why not.

- Suppose we want to draw a mix of opaque and translucent polygons. Explain how to use the depth buffer to assist with rendering in a way that ensures we get the answer we expect.

- What is rasterization? Give a line rasterization algorithm that uses the parametric form of a line. List as many ways as you can think of how this algorithm can be made faster or more efficient.

- What is antialiasing? Why do we antialias points, lines, polygons, etc? Explain how we can use the box filter to do antialiasing. How do we compute the color of any given pixel using this filter?

- What is the main idea behind multisampling? Why is it substantially slower than rendering without antialiasing?

- The important feature of the accumulation buffer is that it is a floating point buffer. In other words, it contains many more bits than the color buffers. Give an example of an operation you might want to perform using the accumulation buffer. Why are these extra bits important?