Assignment 1

Tom Kelliher, CS 320

Due Feb. 4

1. Consider three different raster systems with resolutions of 800×600, 1280×960, and 1680×1050. For each system

   (a) determine its aspect ratio,

   (b) what size frame buffer does it need to store 32 bits per pixel, in bytes,

   (c) what bandwidth does it need, in mebibytes per second (MiB/s), to support a refresh rate of 60 HZ, assuming 32 bits per pixel.

2. Referring to Figure 1.20 on pg. 21, assume that we have a pinhole camera with a projection plane height of 24 mm and a focal length of 50 mm. Assume that we have an object 6 ft high a distance of 10 ft from the front of the camera (in other words, assume (y, z) is $(6, 10)$, in units of ft). Answer the following:

   (a) What is the value of y_p?

   (b) What is the field of view angle, in radians?

   (c) Is the object entirely visible, partially clipped, or totally clipped on the projection plane?

3. What determines whether or not a fragment becomes a pixel?

4. Pick a video card, identify two of its characteristics, and write two paragraphs describing the characteristics you selected. (If no particular video card comes to mind for you, I'd suggest the NVIDIA Quadro 600.) Your paragraphs will be accessed on how successfully you translate those characteristics into your own words under the assumption that your audience is a friend without a technical background.