CS 360, Math Problem Set 3

1. (*0 points*) Suppose you have the camera placed at the origin, facing down the negative Z axis, and the image plane at Z = -2. What is the projection of the following points:

A = (-4, 2, -8)
B = (4, -2, -8)
C = (0, 6, -6)

2. (*0 points*) In the previous problem, suppose the frustum is two units high, extending from top = +1 to bottom = -1. What is the field of view in the Y direction (FOVY)?

3. (*0 points*) Continuing from the previous problem, suppose the frustum extends from left = -1.5 to right = 1.5. What is the aspect ratio of the top of the frustum?

4. (*0 points*) In the matrices for orthographic and perspective projection, we projected onto the Z = 0 plane or a plane parallel to it. There's nothing sacrosanct about Z. Suppose our camera is a weather balloon (high, looking down parallel to the Y axis), and we want to project onto the Y = 0 plane or a plane parallel to that.

(**a**) Give a matrix that does an orthographic projection onto Y = near

(**b**) Give a matrix that does a perspective projection onto Y = near