Exercises for Image Processing 1 - WiSe 2012/13

Exercise 3

1. Show that a perspective projection maps a straight line in a scene to a straight line in the image. (2 Points)

2. Show that the perspective projection of two parallel straight lines results in two lines intersecting in one point (the vanishing point). When does the vanishing point lie in infinity? (2 Points)

3. how does the image of a sphere look like after a perspective projection? Substanciate your answer. (2 Points)

4. A camera with focal length 35mm is placed in the corner of a room at a height of 3m. The optical center lies exactly in the corner of the room. The optical axis is tilted down by 60° and panned by 45° so that it is directed to the center of the room. There is a 75cm high table standing in the room (see drawing). Which image coordinates (given in camera coordinate system) does the marked corner of the table have? (4 Points)