CPSC 314 Homework 4

Term: Jan 2011, Instructor: Wolfgang Heidrich, heidrich@cs.ubc.ca, http://www.ugrad.cs.ubc.ca/~cs314

This problem sheet deals with scan conversion adn BSP trees. Solutions will be discussed in the labs in the week of February 21-25.

1 Scan Conversion of Triangles

a) Derive the **edge equations** for scan-converting the triangle given in device/pixel coordinates below. Pay attention to the sign of the equations, so that positive values correspond to the inside of the triangle.
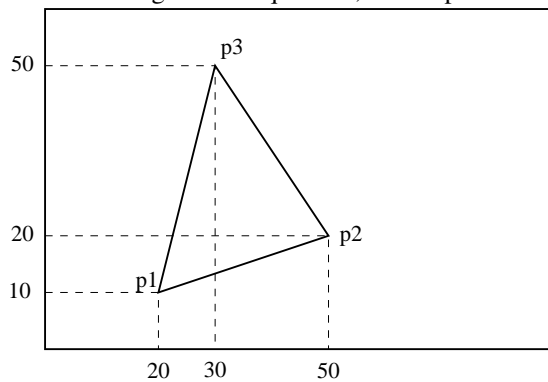
b) Derive the **plane equation** for interpolating some property c across the triangle. The values at the vertices are $c_1 = 0$, $c_2 = 1$, and $c_3 = 2$, respectively. You don't need to solve any equation systems that may arise.

2 BSP Trees

a) The diagram below shows a top-down-view of vertical walls in a "maze". Construct the BSP tree that results from inserting the individual walls in numerical order. Draw the tree such that the right subtree (child) is located on the side that the normal points to. The positive halfspace of a wall is indicated by the side on which the number is located. Make sure to indicate how walls are split.
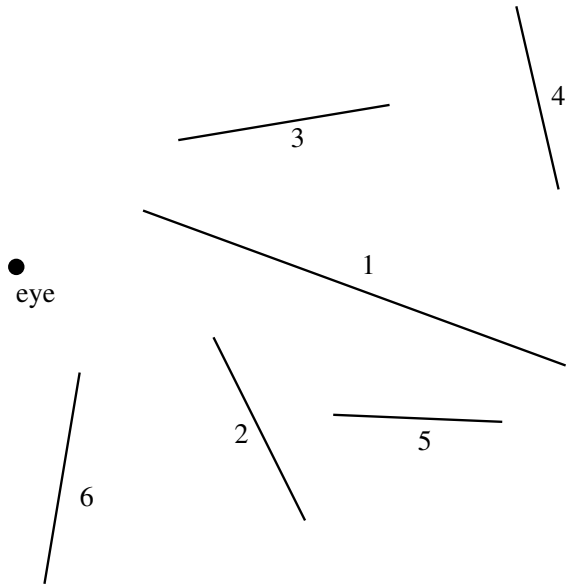
b) What is the traversal order for the indicated eye position?