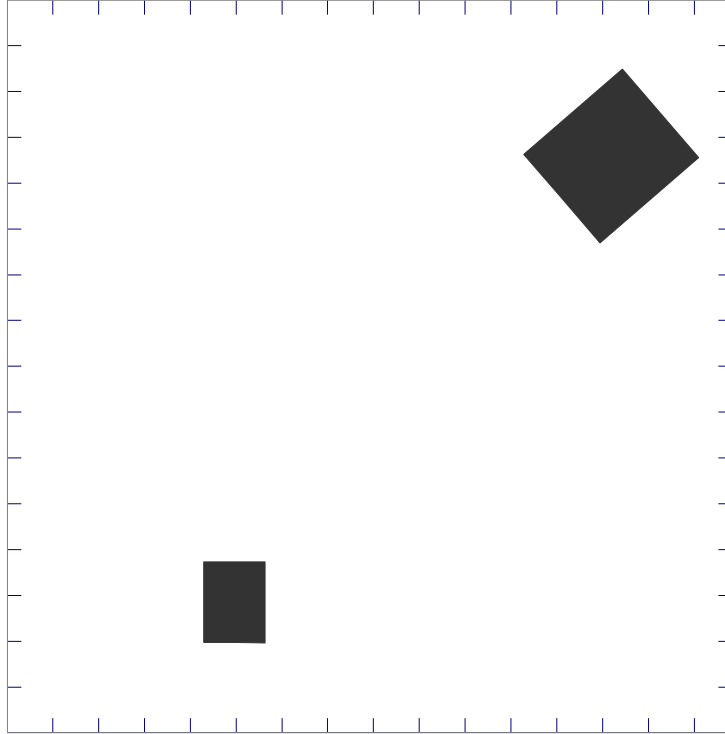


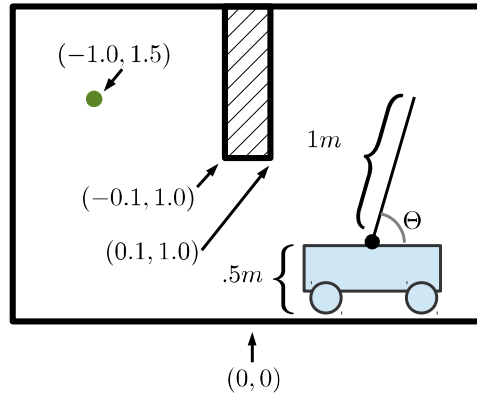
Name: _____

CS354 HW#3, Fall 2015

1. Complete the in-class planning exercise from 10/27. (12pts)
2. Draw the quadtree decomposition of the following room. The hash marks indicate the resolution limit. (5pts)



3. The figure below illustrates a robotic cart. The cart can move to the left or right, and can change the angle of the attached pole. The angle of the pole is indicated by Θ , where $\Theta = 0$ when the pole is rotated all the way to the right and $\Theta = \pi$ when the pole is rotated all the way to the left. The green dot is a goal location for the pole end-point and the hashed box is an obstacle.



- Draw the configuration space for this robot, with x on the horizontal axis and Θ on the vertical axis. Draw \mathcal{C}_{obs} as a shaded region. (6pts)

- Draw a valid trajectory in your configuration space from the robot's current configuration to the goal configuration. (2pts)

- Briefly outline the steps that would be required to apply Dijkstra's algorithm to this planning problem. What additional steps would be required to apply A*? (4pts)

- Which would be more appropriate for planning in this domain, A* or RRT? Justify your answer. (3pts)