HOMEWORK #7

1. Draw a tree to represent all possible integer solutions to the following problem: (5 points)

   Max $x_1 + x_2$
   s.t. $5x_1 + x_2 \leq 10$
   $2x_1 + 4x_2 \leq 8$
   $x_1 = 0, 1, \text{or } 2; x_2 = 0 \text{ or } 1$

2. In the following integer program, consider a tree in which the variables are fixed from left to right with their next largest integer value. Use the given information consisting of the current node in the tree, the solution to the associated linear program, and the current lower bound to indicate which nodes, if any, can be dropped from further consideration. (5 points)

   Max $3x_1 + 2x_2$
   s.t. $x_1 - x_2 \leq 1$
   $x_1 - x_2 \geq 0$
   $x_1 + 2x_2 \leq 3$
   $x_1 = 0, 1, \text{or } 2; x_2 = 0 \text{ or } 1$

   Current lower bound: none.

   Current node: The one in which x_1 is fixed to 2.

   Solution to the associated linear program: infeasible.