1. (10 points) Write a recursive Java method that counts the number of leaves in a binary tree. The method signature is given below.
   ```java
   static <AnyType>
   int countLeaves( BinaryNode<AnyType> root)
   ```

2. (10 points) Prove that in a binary tree with N nodes, there are N + 1 null child references.

3. (3 points) Draw the binary search tree that results from inserting the values 3, 1, 4, 6, 9, 2, 5, 7 (in the order listed) into an initially empty binary search tree.

4. (2 points) Draw the binary search tree that results from deleting the root from the tree in question #3. If a choice is required, choose the successor.