1. List the members of your group below. Underline your name.

2. Prove or disprove: For all integers $p, q > 1$ there is a function f such that

$$n^{2.5} \log_p n^5 = \Theta(f) = n^{2.5} \log_q n^7$$

3. Prove or disprove: The external path length of a binary tree on n nodes is $2n$ more than its internal path length.

4. Depict the *AVL tree* resulting from the insertion of the following keys, in the order listed, into an empty tree.

$$8, 5, 21, 3, 9, 7, 1, 2, 11, 14$$

Show all intermediate steps. In particular, depict the state of the tree immediately following each insertion, before and after any necessary balancing operations. Identify the type of each balancing operation used and the root of the subtree to which it is applied.

[additional space for answering the earlier question]

5. Depict the AVL tree resulting from the deletion of each of the following keys, in order, from the last tree of Question 4.a

$$14, 7, 8, 1$$