Problems, Day 1

1) Let N = {a<b>c<d} be a 4-element poset as in the lecture. Prove that a poset is series-parallel (SP) if and only if it does not contain N as a subposet. Conclude that there is a polynomial time algorithm for recognizing that P is SP.

2) Prove that Bjorner-Wachs inequality is an equality for tree posets.

3) Let P be a tree poset. Prove that numbers {a(x)} dominate numbers {b(x)} as discussed in the lecture.

4) Let lambda=(k,...,k), so that the corresponding Young diagram is a k-square, so n=k^2. Use the hook-length formula to compute the asymptotics for e(P_lambda). Compare with the asymptotics given by the Bjorner-Wacks inequality in this case.