Math 4410 HW 10 - Due Dec. 2 in class

1. Problem 13 F of the text. Ignore the last sentence involving Theorem 13.7.
2. Problem 13 G of text.
3. Let A_n be the permutations $\pi \in S_n$ such that $\pi(1) > \pi(2) < \pi(3) > \pi(4) < \dots$ etc. Similarly, let $B(n)$ be the permutations $\pi \in S_n$ such that $\pi(1) < \pi(2) > \pi(3) < \pi(4) > \dots$. So, if we write permutations as an ordered sequence, $[315264] \in A_6, [1527364] \in B_7$ and $[321] \in S_3$, but neither A_3 nor B_3. Now set $a_n = |A_n|$ and $b_n = |b_n|$. By definition $a_0 = b_0 = 1$. Prove

   (a) $a_n = b_n$.

   (b) $2a_{n+1} = \sum_{i=0}^{n} \binom{n}{i} a_i a_{n-i}$.