Name (Last, First): _____ Student ID: _____

Dror Bar-Natan: Classes: 2014-15: MAT 475 Problem Solving Seminar: http://drorbn.net/15-475

Quiz 11 on April 2, 2015: "Generalize". You have 25 minutes to solve the two problems below. Please write on both sides of the page. **Good Luck!**

Problem 1. Compute the sums (a) $\sum_{k=1}^{n} k(k-1)\binom{n}{k}$ and (b) $\sum_{k=1}^{n} \frac{1}{k+1}\binom{n}{k}$.

Problem 2 (Larson's 2.4.3, modified). Let F_n denote the Fibonacci numbers, defined by $F_0 = F_1 = 1$ and $F_n = F_{n-1}+F_{n-2}$ for $n \geq 2$. Prove that $F_{2n} = (F_n)^2 + (F_{n-1})^2$.