MA 614 – Homework 14
Due Wednesday, Feb 16

Your answers should be detailed explanations in quality mathematical English. You must type your homework in LaTeX.

1. Direct from the definitions (without using the ogf or any recurrence), compute the following.
   (a) $c(n, n-1)$
   (b) $c(n, n-2)$
   (c) $c(n, n-3)$

2. Let F_n, $n \geq 0$, denote the Fibonacci sequence $1, 1, 2, 3, \ldots$.
   (a) Prove that
   $$F_n = \sum_{k=0}^{n} \binom{n-k}{k}.$$
   (b) Let $f(n)$ be the number of ways to choose a subset $S \subseteq [n]$ and a permutation $w \in \mathfrak{S}_n$ such that $w(i) \notin S$ whenever $i \in S$. Show that $f(n) = F_n n!$.