1. Exercises

(1) Prove Theorem 15 by induction using the recurrence for $S(n,k)$ that is prove $\sum_{k=0}^{n} S(n,k)x^{\underline{k}} = x^n$.
(2) Prove $s_1(n,k) = -(n-1)s_1(n-1,k) + s_1(n-1,k-1)$, $k,n \in \mathbb{N}^*$ where $s_1(n,k)$ are the Stirling numbers of the first kind.
(3) Prove $c(n,k) = (-1)^{n-k}s_1(n,k)$.
(4) Prove $c(n,k) = (n-1)c(n-1,k) + c(n-1,k-1)$, $k,n \in \mathbb{N}^*$ where $c(n,k)$ are the unsigned Stirling numbers of the first kind.