Problem f) Let $c(n,k)$ denote the number $c(n,k)$ of permutations in S_n with k cycles. Find formulas for $c(n,n-2)$ and for $c(n,2)$, and double-check that they hold for $n=4$.

Problem g) Let $S(n,k)$ the number of ways to partition the set $[n]$ into k disjoint non-empty subsets (that is, every element of $[n]$ has to be in exactly one of the subsets). For example, $S(4,2)=7$ because we can partition $[4]$ in the following ways:

$\{1,2,3\}\cup\{4\}, \{1,2,4\}\cup\{3\}, \{1,3,4\}\cup\{2\}, \{2,3,4\}\cup\{1\}, \{1,2\}\cup\{3,4\}, \{1,3\}\cup\{2,4\}, \{1,4\}\cup\{2,3\}.$

Find a recurrence for the numbers $S(n,k)$ similar to the one we gave for $c(n,k)$ in problem 56.