Dr. A. Betten Fall 2005

M501 Combinatorics I

exercise sheet # 3

Exercise # 1 (5 points)

Let $s(n,k)$ be the Stirling number of the first kind. Prove that

$$\sum_{n \geq k} s(n,k) \frac{x^n}{n!} = \frac{1}{k!} (\log(1+x))^k.$$

Exercise # 2 (5 points)

Let $S(n,k)$ be the Stirling number of the second kind.

a) Prove that $\sum_{n \geq 1} S(n, n-2) x^n = \frac{x(1+2x)}{(1-x)^5}$.

b) Can you find (and prove) a formula for $S(n, n-3)$?

due to Friday, 10/14/05.