

MATH 28 – HOMEWORK 6

due Wednesday, February 15

1. Find a formula for $S(k, k-2)$ that does not involve any summation signs.
2. The number of all set partitions of $[n]$ (without a restriction on the number of parts) is denoted $B(n)$. These are called the *Bell numbers* (named after mathematician and science fiction author Eric Temple Bell). Give a combinatorial proof (i.e., not induction) of the identity

$$B(n+1) = \sum_{i=0}^n \binom{n}{i} B(i).$$

3. Prove that the number of partitions of n into at most k parts is equal to the number of partitions of n into parts of size at most k . (*Hint*: Think about Ferrer's diagrams.)