1 Homework 7

Due in class Wednesday October 20th

Solve the following problems from the lecture notes:
7.1.19
7.1.22

Solve the following problem from the text page 348:
Problem 8

(a) Consider all ways to write a positive integer n as an ordered sum of positive integers. For example, 3 can be written as $1+1+1$, $1+2$, $2+1$, 3. 4 can be written as $1+1+1+1$, $1+2+1$, $1+1+2$, $2+1+1$, $3+1$, $1+3$, $2+2$. Next consider the number of ways to write n as an ordered sum with exactly k terms. So, the number of ways to write 3 with 2 terms is 2. The number of ways to write 4 with 3 terms is 3.

Give a bijection between the ways to write n as an ordered sum with exactly k terms and subsets of size $k-1$ of a set of size $n-1$.

(b) Now we want to write any positive integer n as an ordered sum of non-negative integers. For example, we can write 3 as an ordered sum of 2 non-negative integers as $2+1$, $1+2$, $3+0$, $0+3$.

Give a bijection between the ways to write n as an ordered sum of non-negative integers with exactly k terms and subsets of size $k-1$ of a set of size $n+k-1$.