
Math 4363 - Combinatorics Homework 3

Due in Class - Thursday 13 February 2020

1. How many integer solutions of

$$x_1 + x_2 + x_3 + x_4 = 30$$

satisfy $x_1 \geq 2, x_2 \geq 0, x_3 \geq -5$, and $x_4 \geq 8$.

2. Consider the multiset $\{n \cdot a, 1, 2, 3, \dots, n\}$ of size $2n$. Determine the number of its n -combinations.
3. A bagel store sells six different types of bagel. Suppose you choose 15 bagels at random.
- (a) What is the probability that your choice contains at least one bagel of each type?
 - (b) If one of the types of bagel is sesame, what is the probability that your choice contains at least three sesame bagels?
4. Determine the total number of combinations, of any size, of a multiset containing k different types of objects with repetition numbers $n_1, n_2, n_3, \dots, n_k$ respectively.
5. How many permutations are there of the letters in ADDRESSES?