Math 61: Homework 3

Due: 2/1/19

Problem 1: Suppose that $X$ is a finite set of size $n$.

(a) How many subsets of size $k$ are there, for $0 \leq k \leq n$? How many ways can you choose two subsets, one of size $k_1$ and the other of size $k_2$, for $0 \leq k_1, k_2 \leq n$?

(b) Suppose $n = 10$, how many ways can you choose two subsets of $X$ so that one is of size 5, the other of size 7 and the complement of second subset is contained in the first subset?

Problem 2: How many solutions are there to the following equation,

$$w + x + y + z = 100,$$

where $w, x, y, z$ are non-negative integers, $x \geq 50$ and $z \geq 6$?

Problem 3: Compute the following sum:

$$\sum_{k=0}^{n} \binom{n}{k}.$$

Problem 4: From Johnsonbaugh:

Chapter 6.2: 34, 35, 61, 62, 93

Chapter 6.3: 33, 40

Chapter 6.7: 11, 19, 24