Math 4363 - Combinatorics
Homework 2
Due in Class - Thursday 7 February 2019

1. A committee of five people is chosen from a group of 10 men and 12 women.

   (a) How many ways can the committee be formed if it is to contain at least two women?

   (b) How many ways can the committee be formed if, in addition, one particular man and one particular woman refuse to serve on the committee together?

2. How many sets of three integers between 1 and 20 are possible if no two consecutive integers are to be in a set?

3. There are 100 students at a school and three dormitories A, B and C, with capacities 25, 35 and 40 respectively.

   (a) How many ways are there to fill the dormitories?

   (b) How many ways are there to fill the dormitories if 50 students are men and 50 students are women; and dormitory A is all male, dormitory B is all female and dormitory C is co-ed.

4. How many ways can two red rooks and four blue rooks be placed on a 8 by 8 board so that no two rooks can attack one another?

5. Determine the number of r-permutations of the multiset

$$\{1 \cdot a_1, \infty \cdot a_2, \infty \cdot a_3, \cdots, \infty \cdot a_k\}?$$