MATH413   HW 2

due **Feb 12** before class, answer without justification will receive 0 points.

1: *(P. 62, #14.)*   A classroom has two rows of eight seats each. There are 14 students, 5 of whom always sit in the front row and 4 of whom always sit in the back row. In how many ways can the students be seated?

2: *(P. 62, #19.)*   We are given eight rooks, five of which are red and three of which are blue.
    (a) In how many ways can the eight rooks be placed on an 8-by-8 chessboard so that no two rooks can attack one another?
    (b) In how many ways can the eight rooks be placed on a 12-by-12 chessboard so that no two rooks can attack one another?

3: *(P. 63, #21.)*   How many permutations are there of the letters of the word ADDRESSES? How many 8-permutations are there of these nine letters?

4: *(P. 65, #38.)*   How many integral 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 $x_4 \geq 8$?
(Use substitution to get ≥ 0 for all variables.)

5:   How many integral solutions of

$$x_1 + x_2 + x_3 \leq 20$$

satisfy $x_1 > 3, x_2 \geq 0$ and $x_3 > -2$?

6: *(P. 65, #40 (a,b).)*   There are n sticks lined up in a row, and k of them are to be chosen.
(a) How many choices are there?
(b) How many choices are there if no two of the chosen sticks can be consecutive?

7: *(P. 63, #28)* A secretary works in a building located nine blocks east

and eight block north of his home. Every day he walks 17 blocks to work. (See the map that follows.)

(a) How many different routes are possible for him?

(b) How many different routes are possible if the one block in the easterly direction, which begins four block wast and three blocks north of his home, is under water (and he can't swim)? (Hint: use subtraction principle)