HW1  Due Wednesday, March 2, 2016

Please refer to the course syllabus for general instructions on completing and submitting homework.

1. One popular style of combination lock uses a combination consisting of a sequence of three distinct integers from the set \{0, 1, 2, 3, \ldots, 59\}. How many distinct combinations are possible?

2. I have 5 different used books written by my favorite author. How many ways can I distribute them to 9 students
   (a) if no student receives more than one book?
   (b) without limiting the number of different books each student receives?

3. I have 5 identical silver coins. How many ways can I distribute them to 9 students
   (a) if no student receives more than one coin?
   (b) without limiting the number of different coins each student receives?

4. How many ten-digit numbers are there
   (a) having only odd digits?
   (b) having only even digits?
   (c) whose digits are obtained by permuting the digits of 122334444?

5. How many ways can I put 22 pennies into five envelopes
   (a) if each envelope is required to contain at least one penny?
   (b) without the restriction in (a)?
   Assume the pennies are indistinguishable, as are the envelopes.

6. At the end of a semester, a teacher assigns letter grades A, B, C, D, F to each of her 22 students.
   (a) How many outcomes are possible in all?
   (b) In how many ways may the teacher assign five A’s, seven B’s, seven C’s, two D’s and one F?
7. A bingo card consists of a $5 \times 5$ grid with a free space in the middle entry, plus 24 integer entries including

- five distinct numbers from \{1, 2, 3, \ldots, 15\} in the first column;
- five distinct numbers from \{16, 17, 18, \ldots, 30\} in the second column;
- four distinct numbers from \{31, 32, 33, \ldots, 45\} in the third column;
- five distinct numbers from \{46, 47, 48, \ldots, 60\} in the fourth column; and
- five distinct numbers from \{61, 62, 63, \ldots, 75\} in the fifth column.

There are $552446474061128648601600000$ different possible bingo cards.

(a) How many different possible bingo cards are there, all of whose 24 integer entries are even?

(b) How many different possible bingo cards are there, all of whose 24 integer entries are odd?