



# Intermediate Math Circles

## October 28, 2015

### Counting I - Problem Set

#### Problem Set

1. A restaurant menu lists 5 meat dishes and 3 fish dishes.
  - a.) How many single course dinners can you order?
  - b.) How many dinners can you order than have 1 meat dish and 1 fish dish?
2. How many numbers between 1000 and 9999 have only even digits?
3. A license plate consists of 4 letters followed by 3 digits. How many different license plates are possible?
4. How many 3 digit numbers are there in which adjacent digits are not the same?
5. In how many ways can 6 people seat themselves in a room with 9 chairs where at most 1 person can sit in each chair?
6. How many permutations of the numbers 1, 2, 3, 4, 5, and 6:
  - a.) begin with an even number?
  - b.) begin with an odd number and end with an even number?
  - c.) begin with an odd number and end with an odd number?
7. How many permutations of the numbers 1, 2, 3, 4, 5, 6, 7, and 8 taken 5 at a time:
  - a.) have 7 and 8 in adjacent positions
  - b.) have 7 and 8 separated by exactly 1 number