Assignment 1

You may work in pairs.

1. Consider South Carolina’s license plate, which is three letters followed by a three-digit number. (Leave answers as products.)

   (a) How many possible license plates are there if the number must be even?
   (b) How many possible license plates are there if no vowels allowed?
   (c) How many possible license plates are there if all letters and digits must be distinct?
   (d) How many possible license plates are there if we change the rules to allow either 3 or 4 letters?

2. Consider 5-letter words again.

   (a) How many start and finish with a vowel?
   (b) How many have at most one vowel?
   (c) How many have exactly three vowels with no two vowels next to each other?

3. An SSN is a 9-digit number with zeroes allowed in every position.

   (a) How many SSNs have exactly two distinct digits?
   (b) How many SSNs have digits that sum to 2?
   (c) How many SSNs have digits that sum to 3?

4. A pizza place offers 5 different meat toppings, and 10 different vegetable toppings. (In each of the following the order of the toppings does not matter.)

   (a) A meat-and-three pizza has 1 meat and 3 different vegetable toppings. How many meat-and-three pizzas are there?
   (b) A double-play has only 2 toppings, but these can be the same topping. How many double-play pizzas are there?
   (c) A glutton pizza has 6 different toppings of which at most 4 can be meat. How many glutton pizzas are there?

Due: Friday 19 January

Game of the Week. Consider the following game. Two players take turns in taking one number from the set \{1, 2, \ldots, 9\} (without replacement). The first person to own a trio of numbers that sums to 15 is the winner. How to play well?