COT 3100 Recitation: Counting 1 Problems

Set #1

1) How many three digit numbers are not divisible by 5, have digits that sum to less than 20, and have the first digit equal to the third digit?

2) Find the sum of the digits in all of the integers from 1 to 10000, inclusive.

3) One thousand unit cubes are put together into a 10 x 10 x 10 cube and the surface of this 10 x 10 x 10 cube is painted. Then, the unit cubes are pulled apart. How many of the 1000 unit cubes have at least one face painted?

4) How many different integers in between 100 and 999 have either three increasing digits or three decreasing digits?

Set #2

1) How many ordered pairs of positive integers (x, y) satisfy the equation $3x + 5y = 501$?

2) Belinda writes down the positive integers in order starting at 1. What is the 2020^{th} digit that she will write down? (For example, she writes 1,2,3,4,5,6,7,8,9,10,11,12,13 to begin, so the 15^{th} digits she writes down is 2, the second digit when writing down 12.)

3) Mr. and Mrs. Zeta want to name their child so that the child's three initials (first, middle, last) are in alphabetical order with no repeated letters. How many different sets of initials could the child have?

4) How many integers with 4 different digits in between 1000 and 9999 are there such that the absolute value of the difference between the first and last digit is 2?