STEVENS
INSTITUTE OF TECHNOLOGY
1870

MA 222

HOMEWORK 3

Show ALL WORK to get full credit.
(Write the pledge on top of your work and sign under it.)

Note: In all problems, round probabilities to four decimal places (unless otherwise stated).

Problem 1:

a) Find the probability of rolling two dice and not getting doubles.
b) Given that every fifth person in line will get a coupon for a free box of popcorn at the movies, what is the probability that you don't get a coupon when you're in line?

Problem 2:

Insulin pens used to administer a patient's insulin at hospitals have a malfunction rate of 9%. This means that out of a box of 200 pens, 18 are defective in some way and must be thrown away. Find the probability of randomly selecting 3 defective insulin pens in a row from a brand-new box of 200 pens, if a defective pen is immediately discarded.

Problem 3:

The following table displays the breakdown of attendees at an International Biology conference by country and their role in the company they were representing.

International Biology Conference Attendees					
	Canada	France	South Korea	UK	US
CEO	138	45	4	19	117
Director	8	4	25	6	63
Partner	23	7	3	20	103
Chairman	12	9	3	9	62
Other	112	146	154	143	2103

A random attendee is selected for an interview.

a) What is the probability that a Partner is selected, given that the attendee is from South Korea?
b) What is the probability that a Canadian is selected, given that the attendee is a director of the company?

c) What is the probability that a director is selected, given that the attendee is Canadian?
d) What is the probability that a CEO is selected, given that the attendee is from the continent of North America?

Problem 4:

Every 6 months, university email requires that a new 5-igit password be set up. No digits are allowed to be repeated and it must be different from your last two passwords. If you let your computer randomly choose a 5-digit code for you with no repeating digits, what is the probability that it will choose one of the last 2 passwords you've had? Round your answer to five decimal places.

Problem 5:

Virginia's Veggie Café offers 5 types of homemade bread, 10 toppings, and 6 different condiments. How many different super sandwiches can be made if a super sandwich consists of 6 different toppings and 2 different condiments?

Problem 6:

Ashley's Internet service is terribly unreliable. In fact, on any given day, there is a 15% chance that her Internet connection will be lost at some point that day. What is the probability that her Internet service is not broken for five days in a row?

Problem 7:

Because Tristan has diabetes, he must make sure that his daily diet includes 2 vegetables, 3 fruits, and 2 breads. At the grocery store, he has a choice of 20 vegetables, 8 fruits, and 5 breads.

a) In how many ways can he make up his daily requirements if he doesn't like to eat 2 helpings of the same thing in one day?
b) What's the probability that a random choice from his possibilities would yield either carrots or spinach in its menu, given that carrots and spinach are both vegetable choices at the grocery store?