MA395 Assignment 2

Name:

1) Baskin Robbins advertises the following "classic" flavors:

vanilla	mint chocolate chip	chocolate
oreo cookies'n cream	chocolate chip	pralines'n cream
very berry strawberry	chocolate chip cookie dough	old fashioned butter pecan
jamoca	jamoca almond fudge	reese's peanut butter cup
rocky road	peanut butter'n chocolate	pistacio almond
gold medal ribbon	world class chocolate	nutty coconut
cherries jubilee	chocolate fudge	french vanilla
heath		

A banana split has three scoops of ice cream. How many different banana splits are possible if each scoop is a different "classic" flavor?

How many with two scoops of one "classic" flavor, and one scoop of a second "classic" flavor?

2) Pitcher Tim Springfield relies on three pitches: A knuckleball, a fastball, and a slow curve. If the batter does not hit any foul balls, Tim will throw at least one and at most six pitches. If any of the three types can be used on a given pitch, how many possible scenarios are there for a trip to the plate with no foul balls? How about if Tim never throws the same pitch twice in succession? (hint: think in terms of a tree diagram).

3) An Asian resturant advertises "combination plates" consisting of three choices from the following list:

beef with broccoli	egg roll	beef with mixed vegetables
spicy chicken with peanuts	spicy double cooked pork	pork with broccoli
pork with broccoli	moo goo gai pan	chicken with mixed vegetables
spicy pepper flower shrimp	shrimp with lobster sauce	chicken wings
beef teriyaki	chicken fingers	hunan chicken
chicken with cashews	sweet and sour chicken	sweet and sour pork
sweet and sour shrimp	spicy string beans	fried rice
orange flavor chicken	bean curd	broccoli in garlic sauce
General Tsao's chicken	beef with black bean sauce	

How many different combination plates are possible if you can choose any three items?

How many different combination plates are there that include spicy string beans? Spicy string beans and fried rice?

4) A Mathematician decides to open an Asian resturaunt in Cambridge. To appeal to this Math-savy population, the resturaunt will have a "function room" where as a novelty the menu will feature "permutation plates" consisting of three items from the list in problem 3 *in a specific order*. How many "permutation plates" are possible? How many if one of the items has to be either beef teriyaki or moo goo gai pan?

5) From elementary set theory, we know that a finite set A with n elements always has 2^n different subsets (counting the empty set $\emptyset$ and A itself). Suppose a resturaunt offers a buffet with all of the items on the list in Problem 3. How many different meals are possible? (Consider a meal to be a list of every item chosen on at least one trip to the buffet table. Should any of the possibilities be excluded?)