

Name: \_\_\_\_\_

## Finite Mathematics Activity 3

1. Julius Caesar goes to Toga Tom's for lunch with his wife and two daughters. Each will order a combo meal. The two girls insist that their meals be 'entirely different' from each other, meaning that they must have different beverages, entrees, sides, and desserts from each other. Julius and his wife will order anything and don't care if their meals are the same or not.

Beverages	Entrees	Side	Desserts
Tea	Falafel	Tabouleh	Baklava
Water	Gyro	Lebanese Salad	Almond Cookies
Yogurt Shake	Shish kabob	Hummus	Fresh Fruit
Lemonade			

Under these restrictions, using the menu above, how many different orders could Julius place for his family?

2. There are 16 students in the class of 65 who told me on the survey that their favorite game was monopoly.
- (a) Suppose I pick 5 people from the class and ask each of them if their favorite game is Monopoly. How many different ways can I pick them so that at least 2 people say "yes?"
- (b) How many of these groups of 5 would consist entirely of people who said "yes?"
- (c) Suppose I look just at the people who prefer Monopoly and now I decide to pick 5 of them to actually play the game. In other words, I not only select 5, but I also tell them what order they will play in (ie, who goes first, second, and third). How many ways could I do this?

3. In Monopoly, you roll two dice every turn. If you roll doubles, you have to roll again. If you roll doubles on that roll, you roll once more and cross your fingers, since if this third roll is doubles, you will land in jail.

Suppose it's my turn in Monopoly and that I am sufficiently far away from the "Go to Jail" space that my only risk of landing in jail is if I roll three sets of doubles. My two dice are different: one is yellow and one is blue. I roll the dice one time and observe the side facing up on each die as an ordered pair (yellow, blue). Example: if the yellow die reads 3 the blue die reads 2, I consider that roll a (3,2) and it's different from a (2,3).

- (a) How many total possible rolls are there for my first roll, if I consider the roll as an ordered pair?
- (b) How many of these rolls are doubles?
- (c) How many ways could I roll doubles on the first roll and then again on my second roll?
- (d) How many ways could I roll doubles on my first two rolls but then end up not rolling doubles on my last roll?

4. You want to study with another student in Math 104, let's call him Archie. The trouble is, you've forgotten Archie's number exactly and it's unlisted. All you know is that the student lives on campus and that the last digit of the number was a 0.
- (a) You have no better plan than to dial every on-campus number ending in 0. How many 5-digit extensions could you be dialing before reaching Archie's number? (Recall, residence hall numbers always begin 4-XXXX).
- (b) As luck would have it, your first number you dial ends up being another person in the class who knows Archie. She tells you that she knows is a seven in Archie's number. How many calls total do you have to make now? (assume that the girl who gave you the info does not have a 7 in her phone number).
5. There are 65 students in this class, and all of them have either red, brown, black, or blond hair. All of them have (if we generalize) blue, green, or brown eyes. All of them are either male or female. Why do I know there are two people in the class of the same gender, with the same color hair and eyes?