

Homework 08, MORALLY Due April 14

1. (0 points) What is your name.

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2. (25 points) Bill makes his Darling her lunch. Her lunch will be a sandwich, a fruit, and a desert.

The possible sandwiches are Egg Salad, PBJ, Tomato and Cheese (so 3 possible sandwiches).

The possible fruits are apple, orange, grapes, strawberries (so 4 possible fruits).

The possible deserts are a muffin, ice cream, applesauce, a pop tart, apple pie. (so 5 possible deserts).

- (a) (10 points) How many ways can Darling have lunch?
- (b) (15 points) Darling says *My Bill, I don't want to have both an apple for a fruit and applesauce or apple pie for desert.* Now how many ways can Bill make her lunch?
- (c) (0 points but good for practice, DO NOT hand in.) (a) Do the two problem above with different numbers, (b) Do the two problems above with variables instead of numbers (e.g., s sandwiches).

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3. (25 points) Bill makes his Darling lunch. Her lunch will be a sandwich, TWO different fruits, and THREE different deserts.

The possible sandwich are Egg Salad, Peanut Butter and Jelly, Tomato and Cheese (so 3 possible sandwiches).

The possible fruits are apple, orange, grapes, strawberries (so 4 possible fruits).

The possible deserts are a muffin, ice cream, applesauce, a pop tart, apple pie. (so 5 possible deserts).

- (a) (10 points) How many ways can Darling have lunch?
- (b) (15 points) Darling says *My Bill, I don't want to have both an apple for a fruit and applesauce or apple pie for desert.* Now how many ways can Bill make her lunch?
- (c) (0 points but good for practice, DO NOT hand in.) (a) Do the two problem above with different numbers, (b) Do the two problems above with variables instead of numbers (e.g., s sandwiches).

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4. (25 points) There are 20 people in a room. 10 are left-handed (LH), 10 are right-handed (RH).
- (a) (8 points) How many ways can a committee of 8 students be formed where we have 4 LH and 4 RH?
 - (b) (8 points) Bob and Abisola do not like each other. Bob is LH, Abisola is RH. How many ways can a committee of 8 students be formed such that the committee DOES NOT have both Bob and Abisola?
 - (c) (9 points) Bob and Abisola do not like each other. Bob is LH, Abisola is RH. How many ways can a committee of 8 students, 4 LH and 4 RH, be formed such that the committee DOES NOT have both Bob and Abisola.
 - (d) (0 points but good for practice, DO NOT hand in) (a) Do the problems above with different numbers, (b) Do the problems above with variables instead of numbers.

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5. (25 points) There are 100 people in a room. 20 are in Kindergarten, 30 are in high school, and 50 are in college.
- (a) (10 points) Alice, Bob, and Carol can't be on the same committee. How many ways can a committee of 80 students be formed such that the committee DOES NOT have ALL THREE of Alice, Bob, and Carol on it? (Note that the committee can have Alice and Bob but not Carol and other combinations like that.)
 - (b) (15 points) How many ways can a committee of 80 students be formed where we have 17 kindergartners, 23 high school students, and 40 are college students?
 - (c) (0 points) Same as the other 0 point problems.