

MATH 330 – Discrete Mathematics – Spring 2025

Turn In Homework Assignment 5

100 Points

Due: Thursday March 27, 2025

Your turn in write up will be graded on neatness, clarity of exposition (notation and definitions) and cleverness, but MOSTLY correctness. There are 5 problems. Each problem is worth 20 points. You may ask me questions if you do not understand the problem. You may discuss the problems with others in class but the write up you turn in must be your OWN work. You may use the spread sheets we built in class or your own spread sheets, class notes or Chapters 1 – 7 from our textbook and Desmos but your conclusions from these MUST be in your write up in your OWN words. You can include tables from spread sheets and graphs from Desmos in your write up. Your write up must be turned in class and be stapled in the left corner if it is more than one page.

1. Answer the following for a Virginia license plate that has a string of three letters followed by a four digit number. How many license plates have (a) an A in the second spot (b) a 1 in it (c) a permutation of 2468 in it?
2. A computer I built has 24 bits for a decimal representation. What is (a) the smallest positive number I can represent in decimal form (b) the largest positive number I can represent in decimal form (c) the number of decimals I can represent (d) the number of decimals x I can represent satisfying $0 < x < 0.1$?
3. Pizza Galore has the toppings hamburger, chicken, fish, mushrooms, onions, olives and pineapple. If I go in once a week to get a different pizza (a) how many years will it take me to eat all the possible pizzas Galore Pizza can make (b) how many years will it take me to eat all possible pizzas with three different toppings (c) how many years will it take me to eat all possible pizzas with chicken or mushrooms in them?
4. Let $A = \{a,b,c,d,e\}$ and $B = \{1,2,3,4\}$. How many functions are there from A to B with domain A? How many ordered pairs (x,y) with x in A and y in B are there? How many of these order pairs have a c or a 2 in it?
5. The author Johnsonbaugh does Example 6.3.1. Do it in all the possible ways and show that it gives the same formula (not just the number). How many of these strings have no letter S next to another letter S?