

Howard University Math Department

Instructions:

PLEASE PROVIDE STEP BY STEP EXPLANATIONS

WRITING ONLY ANSWERS WILL NOT GET FULL CREDIT

Time Limit 30 minutes

Please read the questions carefully before answering

1. A lock (opened with numbers instead of keys) has 4 digits.
 - (a) (6 points) How many 4 digit numbers are possible if each digit can be one of 10 numbers 0,1,2,3,...,8,9 with repetitions allowed?
 - (b) (9 points) How many possibilities if the first 3 digits have to be different and can be only from the 9 numbers 1,2,3,...,8,9 and the fourth digit can be one of 5 letters A, B, C, D, and E?

2. Given that 5 different flavors and 10 different toppings are available at an ice-cream shop, answer the following:
 - (a) (6 points) Totally how many different ice-cream selections (each with one flavor and only one topping) are possible?
 - (b) (9 points) If two friends decide to have different ice-cream selections, differing in flavor as well as topping, how many ways can they do it?

3. (Extra credit) (10 points) In problem 2 if one person gets three ice-cream selections, each differing in flavors and toppings from the other two, how many ways can it be done?