

APPM 3570 / STAT 3100

Fall 2021

Exam 01

September 29

GENERAL INSTRUCTIONS:

- This exam has two parts, and you may start on either as long as you follow the instructions for each.
- Notes, your text and other books, cell phones, and other electronic devices are not permitted, except for calculators.
- Calculators are permitted.
- Write your name and sign and date your pledge to the CU Honor Code in the box below.

On my honor as a University of Colorado Boulder student, I have neither given nor received unauthorized assistance on either part of this work.

Name (Last, First): _____

Signature: _____ Date: _____

ADDITIONAL INSTRUCTIONS FOR PART I: Use the last few pages of your bluebook as scratch paper to work out the following 10 questions. For each question, circle what you believe to be the correct answer. Ambiguous answers to a question will result in 0 points for that question. Do not justify your answers to these 10 questions.

1. (4 points.) What's the coefficient of z^0 (i.e. the constant term) in the expansion of

$$\left(z + \frac{1}{z}\right)^{20} ?$$

2. (4 points.) Urn A has 4 green marbles and 3 red marbles. Urn B has 5 green marbles and 2 red marbles. A fair die is rolled. If the face shows a 2 then a marble is chosen at random from Urn A. Otherwise, a marble is chosen at random from Urn B. What is the probability that a green marble is selected?
3. (4 points.) The word "supercalifragilisticexpialidocious" means extraordinarily good, or wonderful. The letter count of this 34-letters word is given by the table below:

A	C	D	E	F	G	I	L	O	P	R	S	T	U	X
3	3	1	2	1	1	7	3	2	2	2	3	1	2	1

How many different words (in English or otherwise) may be constructed permuting the letters in "supercalifragilisticexpialidocious"?

4. (4 points) A scientific experiment is to be carried out into three consecutive phases, and the experiment as a whole is regarded as a success only if each phase is accomplished successfully. If

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ADDITIONAL INSTRUCTIONS FOR PART II: Use the front of your bluebook to answer to the following 2 questions. On the front cover of your bluebook:

- Write your name (Last, First).
- Write when your class meets (9 AM, or 3 PM).
- Draw a grading table with four rows and two columns.

In addition:

- Start each problem on a new page of your bluebook.
- Attempt all parts for each problem.
- Box in your answers.
- Show all your work and justify your answers.

Problem A. (30 points.) Three classmates, Jeanette, Sue, and Keisha, studied on their own until very late last night for an early exam. Assume that:

- { there is a 4% chance that Jeanette oversleeps;
- { a 2% chance that Sue oversleeps;
- { a 1% chance that Keisha oversleeps; and
- {