

S&DS 241/541  
Problem Set 2  
due Sept. 11, 2024, 11:00 pm via Gradescope

## Guidelines

- Instead of writing your name at the beginning of your problem set, please only write it in your answer to question 6.
- Please write legibly and explain your reasoning. For full credit, your answer and your reasoning need to be not only correct, but clear to the grader. For the two exercises from Ch. 1 that require proofs, the amount of explanation we expect is similar to that in the textbook's proofs. As the mathematician Terry Tao writes, "One should take advantage of the English language, and not just rely purely on mathematical symbols."<sup>1</sup>
- If the answer equals a specific number [such as  $2^{10} \cdot \binom{23}{2} = 259,072$ ], it's OK to express it as a formula involving more than one number [such as  $2^{10} \cdot \binom{23}{2}$ ] instead of reducing it to a single number (such as 259,072). (Of course, you always need to explain your reasoning.)
- Late problem sets will not be accepted unless there are extenuating circumstances (e.g., an illness or family emergency). Undergraduates must obtain a Dean's excuse for any late submission. Graduate students must obtain permission before the deadline. (As mentioned in the syllabus, we'll drop your lowest homework score.)
- You're encouraged to discuss the homework with classmates (this can be a good way to learn), but you must write your solutions independently and in your own words.

## Problems

1. Chapter 1, Exercise 43
2. Chapter 1, Exercise 44
3. Chapter 2, Exercise 3
4. Chapter 2, Exercise 4
5. Chapter 2, Exercise 8
6. (Not graded) On a separate page, please write your name and acknowledge anyone who helped you or discussed the problem set with you (other than the instructor, TFs, and ULAs), as well as any written resources you consulted (other than the textbook and other resources on Canvas). If you don't have any acknowledgments to make, please write "I worked independently."

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<sup>1</sup>This quote comes from Tao's wonderful page of advice on writing and reading mathematical papers:  
<https://terrytao.wordpress.com/advice-on-writing-papers/>