# PROBLEM SET 5

21-241, SPRING 2024, BELLAH

**Problems.** From the course Lecture Notes (any version updated on or after March 30), complete the following:

- Chapter 6 Exercises: #1, #2, #3, #4, #6
- Chapter 7 Exercises: #2, #3, #4, #5, #6
- Optional Extra Credit: Give a geometric proof for Proposition 6.9(1)

**Instructions:** Complete all problems from the list above. Submit your work on Gradescope no later than the indicated due date. Late work will not be accepted. Please make sure you've done all of the following before submitting your work:

- Review this document on good mathematical writing.
- Do not write your name anywhere on your submission. Gradescope will keep track of your submission, and will allow us to use a blind grading process.
- You are welcome to type or hand-write your work.
- If hand-writing, write neatly and legibly, and make sure the scans you upload to Gradescope come out clearly. If we cannot read your work, we will not grade the problem.
- Whenever possible, justify your work. For most problems, if you only write a solution, you will not receive full credit. If you are unsure if you've written enough, please ask.

Unless otherwise stated, each problem on your problem sets will be graded according to the following rubric:

| **Points** | **Rubric** |
|---|---|
| 5 | Solution is presented with clear justification that is logically complete and correct. May include minor typos and computational errors if they do not majorly impact the argument. No important steps are missing or assumed. All assumptions and special cases have been covered. All suggestions for improvement come under the category of "improvements for clarity" rather than "correcting logical errors". Omission of details will be judged depending on context of the material, with simpler steps being acceptable for omission when covering more advanced topics. |
| 4 | Solution is close to full and complete, but contains either a computational error or an error in reasoning that majorly impacts the argument. This score is also appropriate for solutions that are mathematically sound but confusingly written. |
| 3 | Solution is incorrect, but understanding of the problem was demonstrated and student provided a clear outline of a potential approach with information about where they got stuck **-or-** solution is correct but justification is insufficient or so confusingly written that it cannot be followed with a reasonable amount of effort. |
| 2 | Solution is incorrect, but student demonstrated understanding of the problem **-or-** solution is correct and student did not provide justification for their answer. |
| 1 | Solution is incorrect and student did not demonstrate understanding of the problem, but did demonstrate some knowledge of relevant material. |
| 0 | Solution is incorrect or incomplete, and there was no demonstration of knowledge of relevant material. |