

Fall 2017
Analysis I
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HW 4

Due: 26 Sep 2017

The problems are written in the format ‘chapter.section.problem-number’ from Lang’s book. Practice problems are not to be handed in. The HW problems will be graded thoroughly and may be revised once, by the Tuesday after they were returned. Please submit each problem on a detached sheet of paper with your name on it.

Homework problems:

- P10. Prove that the unit ball of a norm is a convex set.
- P11. Prove that on $C^2([0, 1])$, the $C^2([0, 1])$ norm and the $C^1([0, 1])$ norm are not equivalent.
- P12. If $x \in \mathbb{R}^n$, find the largest c and smallest C such that $c\|x\|_2 \leq \|x\|_1 \leq C\|x\|_2$. Prove that these constants are optimal.