Introduction to Analysis I (Fall 2025): Homework 4

- LSIRA stands for the textbook (Lindstrøm: Spaces An Introduction to Real Analysis).

- You **must email your submission as a PDF file** to kbala@wsu.edu. You are welcome to write answers by hand, and scan the writings.

- **If you use LaTeX to typeset your homework submission, you will get 5 extra points!** You could use a LaTeX locally on your computer or use a web service, e.g., Overleaf. Sorry, but using MS Word does not count here!

- Your file name should identify you in the following manner. If you are Kenny Broflowski, you should name your submission KennyBroflowski_Hw4.pdf (and **NOT** Kenny_Broflowski* or Kenn**eth**_Hw4* or Kennybroflowski*..., or Hw4_KennyBroflowski..., or ...). You are welcome to add anything more to your filename *after* these terms, e.g., KennyBroflowski_Hw4_Math401.pdf. Please avoid white spaces in the file name :-).

- **Begin the SUBJECT of your email submission with the same `FirstnameLastname`, e.g., "KennyBroflowski Hw4 submission".**

- The total points (given in parentheses) add up to 130.

- **This homework is due in my email inbox by 5:00 PM on Thursday, September 18**.

1. (25)   LSIRA Section 2.1 Problem 2 (Page 29).

2. (25)   LSIRA Section 2.1 Problem 3 (Page 29).

3. (30)   LSIRA Section 2.1 Problem 5 (Page 29).

4. (25)   LSIRA Section 2.1 Problem 6 (Page 29).
    Ignore the word "if" in the statement of the problem—it's a typo.

5. (25)   LSIRA Section 2.1 Problem 7 (Page 29).
    There is a typo in the expression. You want to prove that

$$\left| \|\mathbf{a}\| - \|\mathbf{b}\| \right| \leq \|\mathbf{a} - \mathbf{b}\| \quad \text{for } \mathbf{a}, \mathbf{b} \in \mathbb{R}^n.$$