Introduction to Analysis I (Fall 2025): Homework 11

- 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 Tolkien Black, you should name your file TolkienBlack_Hw11.pdf (and **NOT** options such as Tolkien_Black_Hw11.pdf or Tolkien-black* or Hw11_TolkienBlack* or ...). You are welcome to add anything more to your filename *after* these terms, e.g., TolkienBlack_Hw11_Math401.pdf. Please avoid white spaces in the file name; TIA!
- **Begin the SUBJECT of your email submission with the same `FirstnameLastname`, e.g., "TolkienBlack Hw11 submission".**
- The total points (given in parentheses) add up to 115.
- **This homework is due in my email inbox by 9:59 PM on Thursday, November 20**.

1. (a) (10) Show that the series $\displaystyle\sum_{n=1}^{\infty} \frac{\cos\left(\frac{x}{n}\right)}{n^2}$ converges uniformly.

   (b) (20) Show that the series $\displaystyle\sum_{n=1}^{\infty} \frac{\sin\left(\frac{x}{n}\right)}{n}$ is continuous.

2. (25) LSIRA Section 4.5 Problem 6 (Pages 101).

3. (35) LSIRA Section 4.5 Problem 7 (Pages 101).

4. (25) LSIRA Section 4.6 Problem 3**(b)** (Pages 102–103).
   We have done 3(a) in class (in Lecture 25).