

## Introduction to Analysis I (Fall 2025): Homework 9

- 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 L<sup>A</sup>T<sub>E</sub>X to typeset your homework submission, you will get 5 extra points!** You could use a L<sup>A</sup>T<sub>E</sub>X 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 Wendy Testaburger, you should name your file WendyTestaburger\_Hw9.pdf (and **NOT** options such as Wendy\_Testaburger\_Hw9.pdf or Wendytestaburger\* or Hw9\_WendyTestaburger\* or ...). You are welcome to add anything more to your filename *after* these terms, e.g., WendyTestaburger\_Hw9\_Math401.pdf. Please avoid white spaces in the file name; TIA!
- **Begin the SUBJECT of your email submission with the same FirstnameLastname, e.g., “WendyTestaburger Hw9 submission”.**
- The total points (given in parentheses) add up to 115.
- **This homework is due in my email inbox by 10:00 PM on Thursday, November 6.**

1. (25) LSIRA Section 3.4 Problem 7 (Page 63).
2. (30) LSIRA Section 3.5 Problem 6 (Page 67).
3. (35) LSIRA Section 3.5 Problem 13 (Page 68).  
 What if you replace “compact” with “closed and bounded” in this problem? Thus, if  $K_n$  are closed and bounded subsets of  $(X, d)$  in this problem, do you still get the nonempty intersection property?  
 You must use techniques introduced in Section 3.5 here. In particular, you must use the convergent subsequence definition of compactness here.
4. (25) LSIRA Section 3.6 Problem 2 (Page 71).  
 Here, you must use the finite intersection property definition of compactness presented in LSIRA Corollary 3.6.5.