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Department of Mathematics and Statistics

MATH 350 : REAL ANALYSIS

Problem Set 1 – due Thursday, September 14th

INSTRUCTIONS:

You should aim to submit this assignment to me in person at the start of Thursday's class; if you cannot make it to class, email me by 11am on Thursday and we can discuss alternative ways to submit your assignment. Late assignments can be left in the mailbox outside my office until 4pm on Friday (incurring a small penalty, as described in the course syllabus). Assignments will not be accepted after 4pm on Friday.

- (0) Read Chapter 1 (pages 1-4).
- (1) Problems 1.1, 1.4, 1.11 in the book.
- (2) Consider the set $A := \{x : x \text{ is a nonempty set}\}$. Is A an element of itself? Briefly justify your answer.
- (3) Let S be the set consisting of all sets that aren't elements of themselves. Carefully explain why this set is problematic. [*This problem illustrates the pitfalls of never carefully defining what a set is!*]
- (4) Using *only* the book's definition of ordered pair (in particular, without using Theorem 2.2 from the book), prove that the only ordered pair corresponding to the set $\{\{1\}\}$ is $(1, 1)$.