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Math 336 – A First Course in Real Analysis

Murray H. Protter – Charles B. Morrey, Jr. – Second Edition

Contraction Mappings, Newton's Method, and Differential Equations

Chapter 14
Implicit Function Theorems and Lagrange Multipliers

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Texts: Protter and Morrey, A First Course in Real Analysis, Second Edition

The book is at an appropriate level for the course. As real analysis books go, it is fairly easy. There is a good range of problems, from very easy to fairly difficult (although few could be described as very difficult). I did not think the chapter on "Integration in $\hat{A}^N$" was very good, but, after doing it and looking at other treatments, I have decided that the Riemann and Darboux integrals are inherently excessively messy in $\hat{A}^N$, and a good treatment of integration in $\hat{A}^N$ requires doing the Lebesque integral, which should not be done at this level. I suggest that the topic be left out of the course. Instead, one could do parts of Chapter 11 (Functions defined by integrals; improper integrals) and the Weierstrass Approximation Theorem. The other chapters I did from the book were good.

One minor caution to anyone using the book – some problems refer back to earlier problems. Occasionally the number of the earlier problem is incorrect (as a result of not changing such references after inserting new problems in the second edition.)

We will use the book again next year.