MATH 361 — HOMEWORK 1.

due on Friday, September 11.

Textbook: *"Elementary Classical Analysis"* , second edition
by J. E. Marsden and M. J. Hoffman

Topics:

- **Review of Math 360**
- **5. Uniform Convergence**
  - 5.1 Pontwise and Uniform Convergence
  - 5.2 The Weierstrass M Test
  - 5.5 The Space of Continuous Functions

First Homework Assignment.

Reading:

- Read sections 5.1, 5.2 and 5.5 of Chapter 5., paying close attention to the examples.

Exercises:

Problem 1. Prove that the normed vector space $(E, \| \|)$ is complete if and only if every absolutely convergent series in E is convergent.

Recall that a set A in a metric space (M, d) is called bounded if there exists $x \in M$ and $R \in \mathbb{R}, R > 0$, such that $A \subset \mathrm{D}(x, R)$.

Problem 2. Prove that the set $A \subset M$ is bounded if and only if for every $x \in M$ there exists $R > 0$ such that

$$A \subset \mathrm{D}(x, R).$$

***Problems*:**

- Page 244: problems $1, 2, 3, 4, 5$
- Page 272: problems 1
- Page 316: problems $2, 3$