MATH 360 — HOMEWORK 7.

due on Friday, October 21.

by J. E. Marsden and M. J. Hoffman

Additional Reading: “Foundations of Modern Analysis”
by J. Dieudonné

Topics:
- 1 The real Line and Euclidian Space
  - 1.7 Norms, Inner Products, and Metrics
- The Topology of Euclidian Space
  - 2.6 Boundary of a set
  - 2.7 Sequences
  - 2.8 Completeness
  - 2.9 Series of Real Numbers and Vectors

Seventh Homework Assignment.

Reading:
- Read Sections 2.7, 2.8 and 2.9. Read your notes.

Exercises:

Problem 1. Prove that if a Cauchy sequence \( \{x_n\}_{n \in \mathbb{N}} \) has a convergent subsequence, than the sequence itself is convergent.

Problem 2. Prove that if \( \lim_{n \to \infty} x_n = x \), than every subsequence of \( \{x_n\}_{n \in \mathbb{N}} \) converges to \( x \) too.

Problems:
- Page 123: problems: 2
- Page 125: problems: 1, 2, 3, 5
- Page 129: problems: 1, 4
- Page 143: problems: 13, 14, 17, 26, 28

The topics and page numbers are from the textbook.