MATH 360 — HOMEWORK 6.

due on Friday, October 14.

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
  – 2.1 Open Sets
  – 2.2 Interior of a Set
  – 2.3 Closed Sets
  – 2.4 Accumulation Points
  – 2.5 Closure of a Set
  – 2.6 Boundary of a set

Sixth Homework Assignment.

Reading:
• Read Sections 2.3 to 2.6.

Exercises:

Problem 1. Prove that if $1 \leq p \leq q \leq \infty$, then

$$
\|x\|_q \leq \|x\|_p,
$$

for every $x \in \mathbb{R}^N$.

(Hint: It is enough to consider the case $\|x\|_p = 1$.)

Problems:
• Page 112: problems: 6
• Page 115: problems: 3
• Page 120: problems: 4
• Page 143: problems: 1, 2, 9, 10, 15

The topics and page numbers are from the textbook.