

MATH 361 — HOMEWORK 9.

due on Friday, November 13.

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

Topics:

- **Chapter 6:** Differentiable Mappings
 - 6.1 Definition of the Derivative
 - 6.2 Matrix Representation
 - 6.3 Continuity of Differentiable Mappings; Differentiable Paths
 - 6.4 Conditions for Differentiability
- **Multilinear Maps, Functional Calculus (with power series)**

Ninth Homework Assignment.

Reading:

- Read Sections 6.1 to 6.4. (We are going to discuss partial derivatives in greater detail next week.) Read the slides (or/and watch the videos).

Exercises:

Problem 1. (See page 330 - problem 4.) Let $f : E \rightarrow F$ (E, F Banach Spaces), and suppose there is a constant M such that for $x \in E$, $\|f(x)\| \leq M\|x\|^2$. Prove that f is differentiable at $x_0 = 0$ and that $Df(x_0) = 0$.

Problems:

- Page 330: problems 1, 2
- Page 338: problems: 1, 2, 3, 4
- Page 344: problems: 2
- Page 383: problems: 1, 3