MATH 361 — HOMEWORK 9.

due on Friday, November 13.

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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 \( f : E \to F \) (\( E, F \) 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