

Math 25b: Honors Linear Algebra and Real Analysis II

Homework Assignment #5 (7 March 2014):
Differentiation cont'd

HINT, n : The hardest of several possible ways to do a proof.¹

This problem set is somewhat abbreviated because Monday the 10th is a midterm exam, not a regular class.

0-2. For Tudor

3-5. For Sadik

6-7. For Nat

More about the basics of derivatives:

0. If you haven't done it yet, solve Problem 6 and/or 10 in the previous problem set.
- 1.-5. Solve Problems 2. n on page 75 of the Edwards text for each $n \in \{1, 5, 8, 9, 10\}$. For $n = 8$, show also that if $f : \mathbf{R}^n \rightarrow \mathbf{R}^m$ is homogeneous of degree $d > 1$ (i.e. $f(t\mathbf{x}) = t^d f(\mathbf{x})$ for all $t \in \mathbf{R}$ and $\mathbf{x} \in \mathbf{R}^n$) and f is differentiable at $\mathbf{0}$ then $f'(\mathbf{0})$ is the zero map $\mathbf{R}^n \rightarrow \mathbf{R}^m$.
- 6.-7. Solve Problems 3.4 and 3.6 on page 88 of the Edwards text [Hint: for 3.6 it may be useful to compare with Problem π , um, 3.14].

The problem set is due Pi Day, March 14, at 5PM.

¹*Definitions of Terms Commonly Used in Higher Math*, R. Glover et al.; cf. also Prob. 3.