

REVIEW TOPICS AND PROBLEMS, 204 SECTION 51

The Final Exam will be held in Ryerson 277
Tuesday March 13 4-6pm

Here is a list of topics to review and some practice problems. In addition, the homework problems are well worth reviewing. (There is some overlap, mainly because I was too lazy to cross reference with the homework.) I will be out of town in the beginning of next week, so no extra office hours right before the exam. Sorry.

- Standard facts about 1-variable differentiation.
- Theorem 11-18 and 11-22, plus whatever you need to make sense of these.
- Partial derivatives, continuously differentiable functions into \mathbb{R} and \mathbb{R}^m .
- The Mean Value Theorem, in all its forms.
- The first and second order approximation theorem for $f : \mathbb{R}^n \rightarrow \mathbb{R}$.
- The first order approximation theorem for $f : \mathbb{R}^n \rightarrow \mathbb{R}^m$.
- $\nabla^2 f$ and the second derivatives test.
- Characterization of positive and negative definite 2×2 matrices.
- The chain rule.
- Matrix multiplication, determinants.
- The Inverse Function Theorem.
- The Implicit Function Theorem.
- Applications of the Implicit Function Theorem in \mathbb{R}^3 .
- Lagrange Multipliers.

And here are some practice problems, if you want. (Only because you asked, I'm not expecting you to do all these problems.)

- 13.1:3, 13.2:5,12,16, 13.3:7,11 (what does this last problem have to do with Lagrange Multipliers?)
- 14.1:1,3,5,8,18, 14.2:2,6, 14.3:2,4,6
- 15.1:2,6,11,13, 15.2:7,8, 15.3:4
- 16.1:10,11,14, 16.3:5
- 17.1:1,5,9, 17.2:2,3,8, 17.3:3, 17.4:4,8,13