

# Math 225 Homework 5

Due 4pm on Fri Feb 28, 2009.

When writing up your solutions, pay attention to what you write. I'm interested in seeing proofs written rigorously. What does this mean? Good proofs are:

- Correct — ideally, every statement should follow from axioms or from what has been proved before.
- Concise — a proof should not contain anything that is not necessary.
- Readable — Human beings both write and read proofs. Don't be afraid to explain in words what you are doing. For example, before embarking on a long computation, it is a good idea to explain what you are doing and why you are doing it.

## 1 Problems

1. Problem 2.10 parts b, h, page 22 Spivak. I'd like you to do this question only using information about the derivative you have up to page 22 of the text. You'll find it helpful to look at the example done on page 22, as well as the example I did in class.
2. Problem 2.13 page 22 Spivak.
3. Problem 2.15 part a page 24 Spivak. (Hint: review the many definitions of determinant from linear algebra. One of them will make this proof easier than the others. It will help you to prove the general case if you first write out what the question asks for the cases  $n = 2$  and  $n = 3$ .)
4. Problem 2.16 page 25 Spivak.
5. Problem 2.17 parts e, g, i page 28 Spivak
6. Problem 2.20 page 28 Spivak
7. Problem 2.24 parts page 28 Spivak
8. Problem 2.25 parts page 28 Spivak

## 2 Things to review

- (a) Chain rule
- (b) Implicit differentiation