

Homework 3

July 15, 2008

The homework is due in class (BEFORE the lecture begins) on **Monday, 21st July**. As mentioned in the course syllabus, there are no electronic submissions and no late homeworks will be accepted unless you have an illness spanning the full period from the time the homework was assigned until it was due (and I shall need to see a medical practitioner's certificate to that effect). Standard academic honesty rules apply. You can discuss problems but the solutions turned in should be entirely your own. Cases of plagiarism will be dealt with strictly. Most of the problems are from the book by Stewart, 6th Edition.

1 Compulsory Problems

1. Section 2.5: problems 10, 12, 20, 29, 60, 61, 64 (all three parts).
2. Section 2.6: 14, 40, 42.
3. Section 2.8: 24, 28, 29, 51, 52.
4. Prove that the derivative of $f(x) = \tan x$ is $\sec^2 x$, by using first principle (i.e. the definition of a derivative using limits). You will find the formula for $\tan(x + h)$ useful in order to solve this problem.

2 Optional Problems

You do not have to submit these, but these are some problems from the book for your own practice.

1. Section 2.5: problems 62, 65.
2. Give an example to show that the converse of the intermediate value theorem is not always true, i.e. given a function that satisfies the intermediate value property in an interval, it may not be continuous.
3. Look at the **review of chapter 2 on page 165/166**. Avoid questions 4, 11. Pay special attention to question 15. Also look at the **true/false quiz on page 166**. The questions in the review and the quiz will serve as useful checkpoints for you.