

MATH 2200 Fall 2002
Homework 1

Below is a list of selected problems from Edwards & Penny, as well as some of my own. It is in your best interest to work all of the problems. All problems from the homework are fair game on exams! Please staple your work. I will be available during office hours for help. Homework is due Monday August 26, 2002 at 9:05am.

§ 2.1 problems 1,5,7,8,9,11,19,21,28,33,34

§ 2.2 problems 1,2,3,5,6,9,13,17,19,25,29,31,33,37,41,43,45

α) Recall on Monday how we were able to find the slope of a tangent line to the parabola $d(t) = t^2$ at any point $(a, d(a))$, and that this slope was $m_a = 2a$. Use similar techniques to find the slope of the tangent line to the graph of $f(t) = t^3$. Repeat this procedure for $g(t) = t$ and $h(t) = 1$. Do you see a pattern emerging? What would you guess the slope of the tangent line to the graph of $r(x) = x^n$ is at the point $(a, r(a))$ (where n is some nonnegative integer). You may *not* use the word derivative anywhere in your exposition.

β) Now that we know that the limit of a sum is the sum of the limits, provided they exist, (or at least we will know after Wednesday or Friday) use your results from problem α) to find the slope of the tangent line at the point $(a, p(a))$ of the graph of the polynomial $p(t) = 1 + t + t^2 + \cdots + t^n$.