Calculus I MA113:10-12 Week 9, Spring break and week 10.

- Homework F, problem #23 and 24, problems plus, page 181. Due Wednesday, 26 March 2003. Part of this assignment will be extra credit.
- The quiz on Thursday, 27 March 2003 will cover section 3.3, monotonic functions.
- The error of the week: Not looking at my watch at 1:55pm on Friday, 7 March 2003.
- When we return your exam, you should be able to compute your midterm grade using the information in the syllabus. Please ask me or your TA if you have questions.
- Please remember that free tutoring is available in MathSkeller. I am there from 3 to 4 on Monday. It was good to see three or four of you there last Monday. Please feel free to ask a few questions on the weeks when there is not a test. Or, perhaps, I should give a test every week? In addition, I have office hours at 11-12 on WF.
- Can you find an example of a function where $f'(x_0) = 0$, but x_0 is not even a local minimum or maximum?
- Can you find a function which has f'(0) = 23 and 0 is an absolute maximum for f?
- In class, a few of you tried to tell me that the tangent line to the graph of a function is a line which touches the curve exactly once. This is true for simple curves like circles and parabolas, but is not true in general.

The simplest example of a function which has a tangent line that meets the graph more than once is a linear function. Then the tangent line is the same as the graph of the function.

A more interesting example is $f(x) = x^2 \sin(1/x)$ (with the definition f(0) = 0). Then the tangent line at the orgin is the x-axis and the graph crosses the tangent line infinitely often in any open interval containing zero. The picture below gives the graph of f.



March 12, 2003