Elementary Functions and Calculus II
Math 132 (Sec 50), Winter 2005
Revision Sheet for Mid-term 1

The mid-term will be based on the material we have covered so far this quarter, but emphasis will be placed on the following topics. Also remember that material from Math 131 will be assumed, so you should remain familiar with that too.

1. You should be able to recall the definitions of the trigonometric functions and the following identities.

    (a) $\sin^2 \theta + \cos^2 \theta \equiv 1$

    (b) $\sin(\theta \pm \phi) \equiv \sin \theta \cos \phi \pm \cos \theta \sin \phi$

    (c) $\cos(\theta \pm \phi) \equiv \cos \theta \cos \phi \mp \sin \theta \sin \phi$

    You should also be familiar with all the other identities we have meet during the course, but will not have to recall them off-by-heart.

2. Recall the following results (without proving them). State clearly any assumptions that are required for each result to hold.

    (a) The mean value theorem.

    (b) The extreme value theorem.

    (c) The first derivative test.

    (d) The second derivative test.

    Also practice some of the exercises involving these theorems. You can expect two or three in the test.

3. This is a typical question:

    (a) State the mean value theorem.

    (b) Use the mean value theorem to show that if $f : [a, b] \rightarrow \mathbf{R}$ is differentiable on (a, b), continuous on $[a, b]$ and $f'(x) = 0$ for all $x \in (a, b)$ then there exists a constant C such that $f(x) = C$ for all $x \in [a, b]$

4. Recall the two limits $\lim_{x \to 0} \frac{\sin x}{x}$ and $\lim_{x \to 0} \frac{1 - \cos x}{x}$, and examples involving these.