Homework 7 for Math 053 Calculus II.

Fall 2008

General guidelines: It is very important that you complete the homework assignments to fix the ideas discussed in class and textbook. It is for your benefit to be able to assess your understanding of the material by working out homework problems. If you need help solving the problems you are welcome to come to my office during my office hours and I will be happy to help you work them out. Homework assignments will not be collected.

When you solve the exercises try to write down all your work. That is the way you will be asked to do it in the tests. You are encouraged to work in groups.

Homework 7: Try to do these problems in the order in which they are assigned.

Problems from section 7.2: 1, 2, 5, 8, 13, 15, 16, 19, 20, 27, 29.

Review on trigonometry:

Problem 1: Consider a rectangular triangle with hypotenuse $h$, one angle $\alpha$, opposite side equal to $b$ and adjacent side equal to $a$. Find expressions for $\sin \alpha$, $\cos \alpha$, $\tan \alpha$, $\cot \alpha$, $\sec \alpha$ and $\csc \alpha$ in terms of $h$ and $a$.

Problem 2: To solve this problem you can use the fact that

$$\cos^2(x) + \sin^2(x) = 1$$
$$\sin(2x) = 2\sin(x)\cos(x)$$
$$\cos(2x) = \cos^2(x) - \sin^2(x)$$
$$\sin(x \pm y) = \sin(x)\cos(y) \pm \cos(x)\sin(y)$$
$$\cos(x \pm y) = \cos(x)\cos(y) \mp \sin(x)\sin(y)$$

Prove the following trigonometric identities:

- $\sin^2(x) = \frac{1}{2}(1 - \cos(2x))$
- $\cos^2(x) = \frac{1}{2}(1 + \cos(2x))$
- $\sin(x)\cos(y) = \frac{1}{2}(\sin(x - y) + \sin(x + y))$
- $\sin(x)\sin(y) = \frac{1}{2}(\cos(x - y) + \cos(x + y))$
- $\cos(x)\cos(y) = \frac{1}{2}(\cos(x - y) - \cos(x + y))$

More problems from section 7.2: 33, 36, 39, 44, 47, 57, 61, 63, 67, 68, 69.