Math 180 Name _____
Winter, 2009

Homework #13
Due Thursday, January 29
No late papers accepted! No excuses!

1. A piece of wire 10 meters long is cut into two pieces. One piece is bent into a square and the other is bent into an equilateral triangle. How should the wire be cut so that the total area enclosed is (a) a maximum? (b) a minimum?

2. Find two positive integers such that the sum of the first number and four times the second number is 1000 and the product of the numbers is as large as possible.

3. Find each of the limits.

a) $\lim_{x\to 0}\dfrac{x\sin x}{1-\cos x}$

b) $\lim_{x\to 0}\dfrac{3^{\sin x}-1}{x}$

c) $\lim_{x\to \infty}\dfrac{e^x+x^2}{e^x-1}$

d) $\lim_{x \leftarrow 0^+} x^x$

4. Let $f(x) = 3x - x^3$. Show that the equation $f(x) = -4$ has a solution on the interval [2,3] and use Newton's method to find it correct to three decimal places.