Math 180
Winter 2009

Lab #1

Let $f(x)=\dfrac{1-\cos x}{x^2}$

a) Use Maple to graph f close to zero.
b) Find $\lim_{x\to 0} f(x)$.
c) Use the result in part (b) to derive the approximation $\cos x \approx 1-\dfrac{1}{2}x^2$ for x near 0.
d) Use the result in part (c) to approximate $\cos(0.1)$.
e) Use a calculator to approximate $\cos(0.1)$ to four decimal places. Compare the result with the approximation in part (d).

The cost of sending an overnight package from New York to Atlanta is $9.80 for the first pound and $2.50 for each additional pound. Use the greatest integer function to create a model for the cost C of overnight delivery of a package weighing x pounds. Use Maple to graph the function and discuss its continuity.

Computer Lab is due on Thursday, January 15.