MATH 113 - MAPLE ASSIGNMENT 2 - DUE November 17, 2010

Answer all the following questions. You are expected to turn in a printout of a Maple worksheet containing the Maple commands and outputs that you used to complete the assignment. This assignment is due by November 17, 2010.

1. (15pts)
   (a) Define the function $f(x) = \frac{4x}{(x^2+1)}$. Use Maple to plot this function in the viewing window of [-1,1].
   (b) Use Maple to find and plot the graphs of $f'(x)$ and $f"(x)$ in the same viewing window.
   (c) Use the graphs you found in (b) to estimate where the intervals on which the function $f(x)$ is increasing and decreasing.
2. (15pts)
   (a) Find the linearization $L(x)$ of the function $f(x) = \sqrt{x^2+9}$ at $x = -4$.
   (b) Plot $f(x)$ and $L(x)$ on the same set of axes. Use the horizontal viewing window [-7,0].
   (c) Plot the percentage error between $f(x)$ and $L(x)$. Use the horintal viewing window [-15,0]. Use the graph to estimate a range of x such that the linear approximation $L(x)$ is within 5 percent of the actual function $f(x)$.
3. (15pts) In this problem, we will find the local and absolute maxima and minima of the function $f(x) = 4x^5 - 9x^4 - 16x^3 + 12x^2 + 12x - 3$ on the interval [-2,3].
   (a) Plot $f(x)$ using the horinzontal viewing window [-2,3]. Use the graph to estimate the location of the local maxima and minima of $f(x)$ on [-2,3].

(b) Use Maple to find the critical values of $f(x)$ in [-2,3].

(c) Find all the local maximum and minimum values of $f(x)$. Also find all the absolute maximum and minimum values of $f(x)$ on [-2,3].