MATH 113 – MAPLE ASSIGNMENT 3 – DUE 12 APRIL 2007

Answer all of the following questions. You may work in groups of no more than three persons to complete this assignment. One copy of the completed assignment is to be turned in for each group. **Each member of the group must sign the assignment.**

You are expected to turn in a printout of a MAPLE worksheet containing the MAPLE commands and output that you used to complete the assignment. You must also include text explaining what you are doing (this can be typed onto the MAPLE worksheet or written by hand on the printout). Include any hand calculations.

This assignment is due by the end of class on Thursday 12 April 2007. **No late assignments will be accepted under any circumstances whatsoever.** If you are not finished with the assignment by the due date, you should turn in what you have for partial credit. You may turn in the assignment early if you wish.

1. (4 pts. each)

   (a) Use MAPLE to find the linearization $L(x)$ of the function $f(x) = (25 - x^2)^{1/3}$ at $x = 3$.

   (b) Plot $f(x)$ and $L(x)$ on the same set of axes. Use the horizontal viewing window $[1, 4]$.

   (c) Use the graph to estimate a range of x such that the linear approximation $L(x)$ is within .1 of the actual function $f(x)$.

2. (4 pts. each) In this problem, we 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 a horizontal viewing window of $[-2, 3]$. Use your graph to estimate the location of the local maxima and minima of $f(x)$ on $[-2, 3]$.

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

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