MATH 114 – MAPLE ASSIGNMENT 2 – DUE 19 JULY 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 at the beginning of class on Thursday, July 19, 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) Consider the integral

$$\int \frac{60x^5 - 24x^4 + 51x^3 - 18x^2 + 14x - 6}{36x^6 - 24x^5 + 40x^4 - 24x^3 + 13x^2 - 6x + 1}\, dx.$$

(a) Use MAPLE to find the partial fraction decomposition of the integrand in the above integral. The syntax is `convert(expr,parfrac,x);` where *expr* is the expression to be decomposed. This expression must be written as a function of x.

(b) Using the decomposition you found in part (a), compute the integral by hand then use the MAPLE `int` command to calculate the integral. Verify that this solution matches the one you found by hand.

2. (4 pts. each)

(a) Use the MAPLE command `int` to evaluate the definite integral $\int_0^1 \cos(t^4)\, dt$ accurate to 10 decimal places.

(b) Use the MAPLE command `trapezoid` to approximate the integral given in part (a) by the Trapezoid Rule with $n = 50$, 52, 54, and 56 and compute the approximation error for each n. Estimate the smallest value of n for which the approximation to the integral given in part (a) is accurate to within .0001.

(c) Use the MAPLE command `simpson` to approximate the integral given in part (a) by Simpson's Rule with $n = 4$, 6 and 8 and compute the approximation error for each n. Estimate the smallest value of n for which the approximation to the integral given in part (a) is accurate to within .0001.