Maple Project
Math 113
April 17, 2005
Lim

1. Let
\[ F(x) = \int_{0}^{x^2 + \sqrt{x}} te^t \, dt \]

(a) Use Maple to evaluate \( F(x) \) and its derivative. Simplify the answer using the "simplify" command.

(b) Compute manually the derivative of \( F \) using the Fundamental Theorem of Calculus part I; show that your answer agrees with Maple’s answer.

2. Use Maple to graph the function \( x^2 \sin(x^2) \) on the interval \([−10, 10]\).

3. (a) Use Maple to calculate the Riemann sum of the integral
\[ \int_{0}^{1} e^{x^2} \, dt \]

with the partition that divides the interval \([0,1]\) into 30 subintervals of equal length, and the point selection in each subinterval the left end point of the interval. (b) Then use Maple to find the numerical value of the integral. (c) Are the two answers close?

4. Use Maple to find the derivative of the function
\[ \frac{-7x^3 - 8x^2 + 6x + 3}{(x^2 + 3x + 1)(2x^4 - x + 1)} \]

Simplify the answer.