Math 240
Spring 2007
Dr. Khalili

MAPLE PROJECT 2

Due date March 19, 2007

1. Evaluate each of the following indefinite integrals by using the given substitutions. Then Check to see if Maple can evaluate the integrals directly.

   (i) $\int \frac{\sqrt{1+x}}{(x-1)^{9/2}}\,dx.$

   Hint : Let $x - 1 = \frac{1}{u}$

   Note: (i)You will receive extra credit, when integrating without using Maple!. Must show your work.

   (ii) $\int \frac{1}{x(3x^5+2)}\,dx\,.$

   Hint : Rewrite the denominator as $x^6\,(3+2\,x^{-5}\,)$ and let $u = 3+2\,x^{-5}\,.$

2. **The complete elliptic integral of the second kind**

   $$E(x) = \int_0^{\frac{\pi}{2}} \sqrt{1 - x\sin^2(t)}\,dt\,, \qquad 0 \le x \le 1$$

   Graph $y = E(x)$ over the interval $[0\,,\,1]$, and find the value of x, to five decimal places of accuracy, for which $E(x) = 1.5$.

3. Try to evaluate

   $$\int (1+\ln x\,)\sqrt{1+(x\ln x)^2}\,dx$$

   with Maple's integral command! Then use a substitution that changes the integral into one that is easier to integrate.