

MAPLE PROJECT 2  
Due date March 3, 2006

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

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

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

**Note:** You will receive extra credit, if integrating without using Maple!. Must show your work.

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

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

2. Suppose that an object moves in the positive direction on an x-axis while subject to the force

$$F(x) = \frac{x}{\sqrt{1+kx}}, \quad k > 0$$

where  $x$  is in meters and  $F$  is in newtons. Find the value of  $k$  so that the work done by  $F$  over the interval  $[0,2]$  is 0.8 J (J = joules.) Not that the work done is just the integral  $\int_0^2 F(x) dx$ .