Physics 9 Spring 1996

Homework Assignment 3.

I. Look up the Series[], Normal[] and related commands. Then
a) Find the series for $atan(x)$ with 10 terms. Evaluate at $x = 1/2$.
b) Do the same for the series for $\log(1 + x)$.
c) Invert the series $y = \sum_{n=0}^{3} c_n x^n$.

II. Look up the NIntegrate[] commands. Then compute
a) $\int_0^1 dx \, \sin\left(\frac{x^2}{1+x}\right) \log(\tan(1 + x/4))$
b) $\int_0^1 dx \int_0^1 dy \, \frac{1}{x^2+y^2+1}$

III. Look up the DSolve[], Evaluate[] and Plot[] commands. Then solve
$y'(t) - \sin(t) y(t) = 0$, with $y(0) = 1$.
Plot the solution in the interval (0,10) and find $y(t = 10)$.