Phys 410

Fall 2014

Homework #11

Due Thursday 11 December, 2014

All problems are from Taylor, *Classical Mechanics*.

1) Problem 12.1   A nonlinear differential equation
2) Problem 12.6 Solve the DDP equation of motion for the nearly linear case [*Note that Mathematica code for solving this equation is available on the class web site*]
3) Problem 12.10 DDP with period doubling
4) Problem 12.13   The Lyapunov exponent
5) Problem 12.14   Quantifying sensitivity to initial conditions
6) Problem 12.16   The time-horizon for predictions
7) Problem 12.19 State space of a simple harmonic oscillator
8) Problem 15.7   Time dilation
9) Problem 15.13 Apparent rotation of a moving meter stick
10) Problem 15.19 The relativity of simultaneity

Extra Credit

1) Problem 15.10   Detailed examination of time dilation

Download Mathematica for free: https://terpware.umd.edu/Windows/Package/2032

Download Matlab for free: https://terpware.umd.edu/Windows/Package/2053