HOMEWORK 6, Due date 3/27 (you can always hand it in early!)

1. A galaxy has cylindrical symmetry and looks like a pancake of fixed thickness t. Its density, however, is a function of r, such that $\rho=Ar(R-r)$, where R is the radius of the galaxy and A is a constant. Calculate its rotational inertia (around its axis of symmetry) as a function of its mass.

2. Sketch the Lissajous patterns that will be obtained using x(t) and y(t) with the same amplitude, and $\omega_y = 0.4\ \omega_x$ and phase difference between x and y of 0, 45 and 90 degrees. Feel free to use an applet such as:

http://www.surendranath.org/Applets/Oscillations/Lissajous/LissajousApplet.html
or  http://www.angelfire.com/falcon/geodoubek/

3. The amplitude of a particular damped oscillator decreases to 1/e of its initial value after 10 periods. Find the frequency (using appropriate approximations) of the oscillator. Give answer in terms of the frequency of the corresponding undamped oscillator.