Extra Credit….
Due: Monday, April 3 2006 before class starts…
You have to get it right for it to count!

A ball of mass m is thrown vertically upwards with an initial velocity v_i. Assume that the force due to air resistance is directly proportional to v^2 and the terminal velocity is v_t. Show that the ball returns to its position with velocity v_f given by:

$$\frac{1}{v_f^2} = \frac{1}{v_i^2} + \frac{1}{v_t^2}$$

Keep in mind these equations are dynamic….

On the way up: $$+m\frac{d^2y}{dt^2} = -bv^2 - mg$$

On the way down: $$-m\frac{d^2y}{dt^2} = +bv^2 - mg$$