Physics 3345 **Professor Scalise**
Fall 2000 **Assignment #10**

Due: Monday 13 November 2000

1. The Virial Theorem relates time-averaged kinetic and potential energies. Verify the Virial Theorm for
   (a) a mass orbiting in a circle around a gravitating body
   (b) a mass attached to a Hooke's Law spring orbiting in a circle
   (c) a mass attached to a Hooke's Law spring oscillating in one dimension

   In each case, average over one complete period.

2. Solve the differential equation for $a_1(v)$ derived in lecture

$$\frac{da_1}{dv}\left(1-\frac{v^2}{c^2}\right) = a_1(v)\frac{v}{c^2}$$

   with the boundary condition that $a_1(0) = 1$.