Phys 448 HW 4

1) Calculate $\Delta x \Delta p$ for the 1st 4 states of the harmonic oscillator. Use Mathematica unless you are a glutton for punishment.
2) Ditto for the 1st 4 states of a particle in a box (infinite potential at the walls). Express your result as a decimal times $\hbar$.
3) Find the eigenvalues and eigenfunctions for a simple harmonic oscillator with $V = \infty$ for $x<0$.
4) Calculate $\Delta x \Delta p$ for the 1st 4 states of the half-harmonic oscillator from 3).
5) Calculate $\langle x \rangle$ for the 10th state of the half-harmonic oscillator, and compare it to the average position of a classical particle with the same energy.