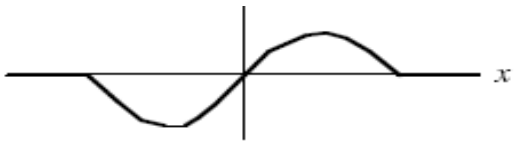
For Friday 9/7, read Griffiths' chapter 1 and turn in by 9:30 am:

1. Notebook, including: questions from reading, important points, filling in missing mathematical steps
2. Suppose you have a particle with wavefunction Ψ, whereΨ(t=0) is graphed at right.



   a. What is the probability of measuring x>0 at t=0?
   b. I measure the position of the particle at t=0 to be x=5 cm (near the peak in Ψ). What is the probability of measuring x>0 at t=1 ms?
3. Let *s* be the num ber of spots shown by a die thrown at random. Calculate <*s*> and σ_s.
4. Consider the Gaussian distribution $\rho(x) = Ae^{-\lambda(x-a)^2}$,where *A*, *a*, and λ are positive real constants.
   a. Find the normalization constant *A*.
   b. Find <*x*>, <x^2>, and σ.
   c. Sketch the graph of $\rho(x)$.
5. Do not turn in, but try all weekly problems.

For Monday 9/10, read Griffiths sections 2.1-2.2 and Q7.3 and turn in by 9:30 am:

1. A particle in the infinite square well has the initial wave function

$$\Psi(x,0) = \begin{cases} A, & 0 \le x \le a/2 \\ -A, & a/2 < x \le a \end{cases}$$

   a. Sketch $\Psi(x,0)$ and determine the constant A.
   b. Find $\Psi(x,t)$
   c. What is the probability that a measurement of the energy would yield the value E_1?
   d. Find the expectation value of the energy.

2. Do not turn in, but try weekly problems 1-2 (from week 2).

Weekly homework due 9:30 am on Monday 9/10.

1. Corrections to Friday's reading questions
2. Find *d<p>/dt* in terms of *V(x).*
3. The size of an atom is approximately 10^{-8} cm. To locate an electron within the atom, one should use electromagnetic radiation of wavelength not longer than, say, 10^{-9} cm.
   a. What is the energy of a photon with such a wavelength (in eV)?
   b. What is the uncertainty in the electron's momentum if we are uncertain about its position by 10^{-9} cm?
4. Consider the wavefunction $\Psi(x,t) = Ae^{\frac{-(x-x_0)^2}{4a^2}} e^{\frac{ip_o x}{\hbar}} e^{i\omega_o t}$
   a. What is the normailization constant *A*?
   b. Calculate the expectation of *x*, x^2, *p* and p^2.
   c. For what potential energy function *V(x)* does Ψ satisfy the Schrodinger equation?
   d. Calculate σ_x and σ_y. Are they consistent with the uncertainty principle?