Assignment #3 For Monday 9/10

1)   Consider the following state vectors:

$$|\psi_1\rangle = 2|+\rangle + 3|-\rangle \quad ; \quad |\psi_2\rangle = -3i|+\rangle + 2|-\rangle \quad ; \quad |\psi_3\rangle = |+\rangle + e^{i\pi/4}|-\rangle$$

   a) Calculate the inner-product of $\langle\psi_2|$ with $|\psi_1\rangle$
   b) Normalize each state vector
   c) For each normalized state vector, use Postulate 4 to calculate
      the probability that the spin-component is up or down along the
      z-axis. Use bra-ket notation for the entire calculation.
   d) Answer the following question with a sentence or two. Would
      you expect to find the same probabilities if you measured the
      spin components along the x- and y-axes? Why or why not?

2)   Show that a change in the overall phase of a quantum state vector
   does not change the probability of obtaining a particular result in a
   measurement. To do this, consider how the probability is affected
   by changing the state $|\psi\rangle$ to the state $e^{i\alpha}|\psi\rangle$

Assignment #4 For Wednesday 9/12

   1) , Complete the following problems at the end of
      Chapter 1: 1.6, 1.10, 1.11