Homework March 17, 706, Spring 2011, due: March 25

1) Problem 5 of chapter 3 of Sakurai and Napolitano. Explain your results, *i.e.*, explain why you could have guessed the answers.

2) Problem 13 of chapter 3 of Sakurai and Napolitano.

3) Problem 14 of chapter 3 of Sakurai and Napolitano. For the first part, *use index notation.* Interpret the second part of the problem in the following way: find a unitary matrix which transforms G_z into J_z as we constructed it in class. Leave as much freedom as possible in this unitary transformation (phase factors, minus signs, *etc.*). This gives us a basis transformation. Find out what happens with $G_{x,y}$ under this basis transformation, and adjust the unitary transformation such that also the transformed $G_{x,y}$ coincide with the $J_{x,y}$ we constructed in class.