

Problem Set 10
P511—Quantum Mechanics, Fall 2008
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Due Tuesday, November 18, 2008

EXAM DATE: As we decided in class, the next in-class exam will be **Tuesday, November 25.**

Note, you are welcome to use a symbolic manipulation program such as Mathematica to complete any part of this assignment.

- 1.) Derive Eq. (3.3.11) on page 170 of Sakurai and prove that the unimodular condition (3.3.12) is obeyed if it is obeyed for $U(a_1, b_1)$ and $U(a_2, b_2)$.
- 2.) Equation (3.3.16) on page 172 is needed for the simplification of the Euler rotations. It is possible to show this geometrically, but here I would like you to prove the equation using what we derived in class. In class I showed you an explicit formula for $R(\hat{n}, \theta)$. First calculate each of the four R matrices and then show that the product on the RHS of (3.3.16) is equal to the LHS.
- 3.) Now prove Eq. (3.3.17).
- 4.) Sakurai, Problem 3.14.