

## Physics 711 Homework Problems

1.

a) Prove the identity

$$(\vec{\sigma} \cdot \vec{a})(\vec{\sigma} \cdot \vec{b}) = (\vec{a} \cdot \vec{b}) + i\vec{\sigma} \cdot (\vec{a} \times \vec{b})$$

b) Use the Baker-Campbell-Hausdorff identity to compute

$$e^{iJ_x\alpha/\hbar} J_y e^{-iJ_x\alpha/\hbar}.$$

2.

Sakurai problem 3.8.