Problem Set 3
Physics 221
Due October 22

Some abbreviations: B - Boas.

1. B. p.142 #17 & #18 & #23 & #25
2. B. p.159 #9 & #10 & #11 & #12 & #26 & #33
3. B. p.160 #41 & #58
4. Use the bra-ket notation we introduced in lecture. Show that for a Hermitian operator $H$, any two eigenvectors $|v_1>$ and $|v_2>$ satisfying

$$H|v_1> = \lambda_1 |v_1>, \quad H|v_2> = \lambda_2 |v_2>$$

obey the relation

$$(\lambda_1 - \lambda_2) <v_1|v_2> = 0.$$ 

5. Write down the most general $2 \times 2$ unitary matrix. Find the eigenvalues of this matrix.