PHYS 308 – HOMEWORK # 5 – DUE WEDNESDAY, 3/9/2011

1. Show that the following matrix is a unitary matrix:

$$U = \begin{pmatrix} \frac{1}{4}(1+i\sqrt{3}) & \frac{\sqrt{3}}{2\sqrt{2}}(1+i) \\ -\frac{\sqrt{3}}{2\sqrt{2}}(1+i) & \frac{1}{4}(\sqrt{3}+i) \end{pmatrix}$$

2. Show that the Pauli spin matrices are Hermitian.

3. Problem 4.1 p.205.

4. Problem 4.2 p.205.

5. Problem 4.5 p.205.

Key

Unless otherwise specified, problems are from the course textbook:

F.W. Byron, R.W. Fuller
Mathematics of Classical and Quantum Physics
Dover Publications (1992)
ISBN-10: 048667164X, ISBN-13: 978-0486671642.

Problem X.Y p.Z means "Problem No. Y of Chapter X, page Z."

Example: Problem 1.3 p.39 = Problem No. 3 of Chapter 1, page 39.
