Homework 7
Due Friday, October 14th at 5pm

Reading: Read Boas Ch. 3, section 11, section 12. All Boas problems are from Ch. 3.

1. (**a**) Compute the Hermitian conjugate $M^\dagger$ of the matrix

$$M = \begin{pmatrix} 1 + i & 2 - 2i \\ 4 + 3i & 2 \end{pmatrix}.$$

(**b**) Let a and b be complex numbers such that $|a|^2 + |b|^2 = 1$. Is the matrix

$$\begin{pmatrix} a & b \\ -\bar{b} & \bar{a} \end{pmatrix}$$

unitary? Is it special?

(**c**) Check that the set of all such matrices forms a group. [Hint: Don't forget to distinguish the two matrices that you multiply together to check closure.] Using the traditional naming scheme for matrix groups, what would you call this group?

2. Boas 14.11, 14.12, 14.13, and 14.14.

3. Boas 14.15 and 14.16.