Homework 5

Due date: Wedesday, January 21

1. Franklin Chapter 4, Problem 4, page 102.
2. Franklin Chapter 4, Problem 4, page 109.
3. Franklin Chapter 4, Problem 5, page 109.
4. Franklin Chapter 4, Problem 4, page 115.
5. Franklin Chapter 4, Problem 5, page 115.
6. Franklin Chapter 4, Problem 4, page 120.
7. A skew Hermitian matrix is a matrix that satisfies $K^* = -K$.
   (a) Show that $K = U\Lambda U^*$, with Λ diagonal and for a unitary U.
   (b) Show that the eigenvalues are imaginary and the eigenvectors orthogonal.
   (c) Show that $K + I$ is invertible.
   (d) Show that $(I - K)(I + K)^{-1}$ is an orthogonal matrix.
   (e) Show that e^{Kt} is a unitary matrix.