1. 11.3 (a) and (b)

2. (Use Matlab for part (b))
   a. JVV Problem 11.13
   b. Once you have the model, compute the eigenvalues and eigenvectors for $k_1=k_2=1, c_1=c_2=0, m_1=m_2=m_3=10$. Explain the physical meaning of each eigenvector, by describing the motion associated with initial conditions that excite only one eigenvector to respond (e.g. “this eigenvector corresponds to all the cars in the train moving back and forth in phase with one another, as seen by the relative phase of each element of the eigenvector”).

3. Perform the eigenvalue-eigenvector analysis described in Problem 2(b) above, using the state-space system for the Quanser (use the “A” matrix in the first part of the solution for Homework 5, Problem 4). Use numerical values from Lab 1. Use Matlab for this problem.

4. 11.28. For part (d), use the Laplace transform method of example 11.5.1 to find $e^{At}$ as shown in equation (11.18), then multiply by the initial condition as shown in equation (11.12a).

5. 11.25 – for this problem, compute the transition matrix for arbitrary $t$, and then use equation (11.21) to solve for the forced response (this approach only works if the input is constant over the interval $[0…t]$). Use mathematical expressions for your solution, rather than numerical values.

6. 11.24 – Note that the same transition matrix can be used to get from $t=0$ to $t=1$, from $t=1$ to $t=2$, and from $t=2$ to $t=3$.

7. 12.1