1. Do 25.1 on page 194 of Trefethen and Bau. For part (*a*) I suggest thinking about Gaussian Elimination, and using induction. For part (*b*) there are 2×2 counter examples. Note the application to computation of part (*a*). It gives you a simple test for isolated (i.e., distinct) eigenvalues, something that many of our subsequent methods assume.

2. Do 25.2 on page 195 of Trefethen and Bau. Use induction again.

3. Do 26.1 on page 200 of Trefethen and Bau.

4. Do 26.3 on page 201 of Trefethen and Bau. The proof of part (*a*) will follow more from *your proof* of the equivalence of the conditions in 26.1 than from the fact that they hold. In other words, do 26.1 first...

5. Do 27.5 on page 210 of Trefethen and Bau. When you look at page 95 you should be using that $A\mathbf{w} = \mathbf{v}$, and that $(A + \delta A)(\mathbf{w} + \delta\mathbf{w}) = \mathbf{v}$ where $\tilde{\mathbf{w}} = \mathbf{w} + \delta\mathbf{w}$ is what you compute. Do not try to invoke general backward stability results. Note that the normalized eigenvectors will form an orthonormal basis (i.e., don't forget the assumptions about A).