Here are a couple of hints to Homework 14. Enjoy!

SECTION 5.3: DIAGONALIZATION

5.3.1, 5.3.3. If \( A = PDP^{-1} \), then \( A^k = PD^kP^{-1} \)

5.3.5. The eigenvalues are just the diagonal entries of \( D \), and the eigenvectors are the corresponding columns of \( P \)

5.3.7, 5.3.11, 5.3.17. All you have to do is to find \( D \) and \( P \) so that \( A = PDP^{-1} \). To find \( D \), find the eigenvalues. To find \( P \), find the eigenvectors, and put them together in a matrix.

5.3.21.
(a) F
(b) T
(c) F
(d) F

SECTION 5.4: EIGENVECTORS AND LINEAR TRANSFORMATIONS

5.4.3. Remember that \( e_1 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} = (1, 0, 0) \) etc. To find the matrix in (c), just put the answers you find in (b) together in a matrix. It’s that easy!

5.4.7. For every polynomial \( p = 1, t, t^2 \), calculate \( T(p) \), and express your answer in terms of \( 1, t, t^2 \). The coefficients give you each column of your matrix.

5.4.15. Find the eigenvectors of \( A \) (that’s sort of the point of this section)