Exercises from Strang P. 314 2,4,11,15,16,18,29,31,34; P.436 1,5-11,15,19,20.

Additional Question Consider the matrix

$$A = \begin{pmatrix} 9 & -1 & -2 & 4 \\ -4 & 2 & 1 & -2 \\ 8 & 0 & 0 & 4 \\ -10 & 2 & 3 & -4 \end{pmatrix}$$

1. Find the eigenvalues of A. (Hint: You need to find $\chi_A(t) = |tI - A|$, the characteristic polynomial of A. Remember that you can do both row and column operations before computing that determinant! If you're careful, one row and one column operation results in a matrix that is *almost* upper triangular.)

2. Find eigenvectors corresponding to each of your eigenvalues.

3. What are the algebraic and geometric multiplicities of each of your eigenvalues?

4. Is A diagonalizable? Explain your answer.