Reading Assignment 11

Read Sect. 4.1, 4.2

1. Is it true that the determinant is a linear transformation? Prove or give a counterexample.
2. What is the inverse of a 2×2 matrix A, it it exists? Give an example of an invertible 2×2 matrix and use the formula in page 201 to find its inverse.
3. Explain the geometric interpretation of the determinant of 2×2 matrices. Do you have a guess of how it generalizes for $n > 2$?
4. Write the definition of determinant for $n > 2$ making sure to explain all the symbols introduced.
5. Use the definition in page 209 to comute the determinant of $\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$ making sure to show all the steps.
6. Use the definition in page 209-210 to compute the determinant of an arbitrary 3×3 matrix, $A = (a_{ij})_{1 \leq i,j \leq 3}$, making sure to show all steps.
7. Give an example that illustrates Theorem 4.3.
8. Write an outline (or summary) of the proof of Theorem 4.3. That is, write all the main ideas.
9. In your own words, explain what Theorem 4.4 says. Give an example of a 3×3 matrix and compute its determinant along two different rows.
10. Give an example to demonstrate the validity of (a), (b) and (c) in page 217.
11. Use the method in example 6, page 219 to compute the determinant of the matrix in exercise 21 Section 4.2.

Practice Problems: Sect. 4.1 # 1, 5, 9
Sect. 4.2 # 1, 7, 11, 12, 18,