

Reading Assignment 9

Read Sect. 3.3

1. Write a system of 4 equations and 3 unknowns and the corresponding coefficient matrix.
2. What does it mean to say that s is a solution of $Ax = b$?
3. When we say that a system of equations is consistent/inconsistent, what are we saying?
4. What does it mean when we say that a system of linear equations is homogeneous? Can you think of a reason they gave it this name?
5. Give an example of a homogeneous and a non-homogeneous system.
6. What is the relationship between the solution set of the homogeneous system: $Ax = b$ and the nullspace $N(L_A)$? Please explain.
7. Give an example to illustrate Theorem 3.8 different from example 2 in your book?
8. Suppose the system $Ax = b$ has a solution, then how can we use the solution set of $Ax = 0$ to write all solutions for $Ax = b$?
9. Does Theorem 3.9 say that if $Ax = 0$ has solutions then $Ax = b$ for any b has solutions? Explain why or why not and if not give an example that shows that this is not the case.
10. What is the solution of $Ax = b$ if A is invertible?
11. What can you say about the matrices A and $(A | b)$ if $Ax = b$ is consistent?
12. Read the proof of theorem 3.11. In what set is b contained if $Ax = b$ has a solution, please be as precise as possible?

Practice Problems: Sect. 3.3 # 1, 2, 3, 4, 6, 7