MATHEMATICS FOR ECONOMICS

PROBLEM SET 1

The problems came from Simon and Blume (1994).

Although you can check some of the answers in the back of the book, I expect you to attempt each problem independently, and check your answer only after you have either solved the problem or struggled with the problem unsuccessfully for 15 minutes. Similarly, I expect you to struggle for 15 minutes before getting help from a classmate or the instructor. Because the course is so fast-peace, I suggest you limit your self to 15 minutes if you are totally stuck; make a note to ask a hint, and then move on to the next problem.

Chapter 11: 14
Chapter 26: 9, 12, 27
Chapter 27: 1, 8, 11, 12(a, b), 13(for a, b in 12), 14(for a, b in 12)

In addition, you are asked to answer the following open question in Note 1

1. Prove that if A^{-1} exists, then it is unique (Theorem 5).
2. How many vectors form a basis for R^n? Provide one simple basis.
3. Provide necessary and sufficient conditions in terms of n, m and r_A for $A\mathbf{x} = \boldsymbol{\alpha}$ to have one, and only one, solution for all $\boldsymbol{\alpha} \in R^m$.