18.06 Problem Set 7

due Thursday, October 30, 2014, before 4:00 pm (sharp deadline) in Room E17-131

Write down all details of your solutions, not just the answers. Show your reasoning. Please staple the pages together and **clearly write your name**, your recitation section, and the name of your recitation instructor on the first page of the problem set.

Cooperation on problems is permitted, but all solutions must be written up independently and you must list your collaborators on the problem set. You should first try to solve each problem yourself, otherwise you will not learn much from hearing the solution.

Please note that the problems listed below are out of the 4th edition of the textbook. Please make sure to check that you are doing the correct problems.

Problem 1. Section 5.2, Problem 3, page 263.

Clarification. In this problem x's symbolize 5 nonzero entries (not necessarily equal).

Problem 2. Section 5.2, Problem 17, page 265.

Clarification. The matrix A_n is the $n \times n$ matrix as in Example 6 on page 261.

Problem 3. Section 5.2, Problem 23 page 266.

Clarification. The block matrix $\begin{pmatrix} A & B \\ C & D \end{pmatrix}$ with 2×2 blocks is the 4×4 matrix

$$\begin{pmatrix} a_{11} & a_{12} & b_{11} & b_{12} \\ a_{21} & a_{22} & b_{21} & b_{22} \\ c_{11} & c_{12} & d_{11} & d_{12} \\ c_{21} & c_{22} & d_{21} & d_{22} \end{pmatrix}$$

Problem 4. Section 5.2, Problem 31 page 268.

Clarification. In this problem "exchange" means switching of any two numbers in a permutation. The problem asks to find the minimal number of such exchanges needed to obtain the permutation 4, 1, 2, 3 from 1, 2, 3, 4.

Problem 5. Section 5.3, Problem 5 page 279.

Clarification. In this problem, assume that A is invertible.

Problem 6. Section 5.3, Problem 7 page 279.

Problem 7. Section 5.3, Problem 14 page 280.

Problem 8. Section 6.1, Problem 4 page 293.

Problem 9. Section 6.1, Problem 26 page 296.

  Clarification. See clarification for Problem 3.

Problem 10. (Computational Problem)

  Available at   `http://web.mit.edu/18.06/www/Fall14/ps7c.pdf`