

18.06 (Fall '12) Problem Set 10

This problem set is due Thursday, December 6th, 2012 by 4pm in 2-255. The problems are out of the 4th edition of the textbook. For computational problems, please include a printout of the code with the problem set (for MATLAB in particular, `diary("filename")` will start a transcript session, `diary off` will end one, also copy and paste usually work as well.)

1. Do Problem 6 from 7.1.
2. The $n \times n$ matrices form a vector space of dimension n^2 . Let A and B be two matrices in this space. Which of the following map from the space of $n \times n$ matrices to itself or to \mathbb{R} are linear? Explain your answer.
 - (a) $X \mapsto AXB$.
 - (b) $X \mapsto X^TAX$
 - (c) $X \mapsto AX + XB$
 - (d) $X \mapsto \text{trace}(X)$
 - (e) $X \mapsto \det(X)$
3. Do Problem 1 from 7.2.
4. Do Problem 2 from 7.2.
5. Do Problem 3 from 7.2.
6. Do Problem 4 from 7.2.
7. Do Problem 20 from 7.2.
8. Do Problem 21 from 7.2.
9. Do Problem 11 from 8.1. (It seems that in some version of the 4th edition of the book, this problem is Problem 10, we want you to do the problem starting with the words "Find the displacements.."). You are only asked to do the fixed-fixed case.
10. Free points !