18.06 Problem Set 2

Due Thursday, 23 September 2010 at 4pm in the undergrad math office. Please note that the problems from the textbook are out of the 4th edition: make sure to check that you are doing the correct problems.
Each Problem worth 10 points.

1. Do problem 5 from section 2.6.

2. Do problem 16 from section 2.6.

3. Do problem 21 from section 2.6.

4. Do problem 13 from section 2.7.

5. Do problem 19 from section 2.7.

6. Do problem 34 from section 2.7.

7. Do problem 10 from section 3.1.

8. Do problem 22 from section 3.1.

9. Do problem 24 from section 3.1.

10. For various values of n, perhaps $n = 100, 500$, and 1000 on your computer find the times of the following four matrix problems.

    (a) matrix multiply;
    (b) inverse;
    (c) matrix add;
    (d) LU factorization.

    Then divide by the approximate number of operations (adds and multiplies) to get a "cost per operation" for each problem.

    In Matlab you can, for example, go

    a=rand(n); b=rand(n); tic, a*b; t=toc; $(t/(2*n^3))$

    what runs at the fastest rate? What at the slowest?

    Submit your code and a table to support your answer.

    You may want to run 100 trials for each n and take an average to be sure your answer is accurate.