MATH 611, Fall 2008
Homework 4
Due November 5, 2008

1. Problem 17.3(c), as a published matlab script.

2. Problem 20.5.

3. Problem 21.4.

4. Problem 21.6.

5. Write a matlab program for the following problems, making use of `[L,U,P]=lu(A)` for pivoted LU factorization of an $m \times m$ matrix A.

   (a) Solve $A^k x = b$, for positive integer k and m-vector b.

   (b) Compute $c^* A^{-1} b$, for m-vectors b and c.

   Use only the factorization of A, matrix multiplication, and triangular substitution (no calls to `inv` alllowed, for example). Include an asymptotic flop count in each case, not including the cost of the factorization.

6. Suppose A is HPD and $A = R^* R$ is a Cholesky factorization. Show that $\|A\|_2 = \|R\|_2^2$ and $\kappa_2(A) = \kappa_2(R)^2$.