

Math 344 - Homework Assignment 4 - Due Feb. 5

1. Let $A_1 = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 4 \\ 3 & 4 & 6 \end{bmatrix}$ and $A_2 = \begin{bmatrix} 3 & 2 & 3 \\ 2 & 5 & 4 \\ 3 & 4 & 6 \end{bmatrix}$. For each matrix, complete the following.

(1) Find the LDL^T decomposition where L is a lower triangular matrix with 1's on its diagonal and D is a diagonal matrix.

(2) Determine if A_i is positive definite. In the case it is, find $\bar{L}\bar{L}^T$ decomposition of A_i where \bar{L} is a lower triangular matrix.

2. Page 180:

2(d) - 1-norm, 2-norm and ∞ -norm

5(b), 5(d) - compute also $\|A\|_1$, $\|A\|_\infty$ and $\|A\|_F$ and verify $\rho(A) \leq \|A\|$.

3. Page 234:

a. 2, 4, 5(c), 13

b. Extra points: 14, 16