Linear Algebra
C Term, Sections C01-C04
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Linear Algebra Assignment 7 (extra)

DUE DATE: **Wednesday**, February 26, 4pm. Submit to MA2071 mail slot in SH108.

N.B. No late assignments will be accepted for credit.

N.B. Keep in mind Professor Martin's rules for completing assignments.

Please complete the following four problems:

1. Suppose A is a 4×4 matrix with eigenvalues $4, 2, 2, 1$.
   (a) What are the eigenvalues of $8A$? Explain.
   (b) What are the eigenvalues of A^3? Explain.
   (c) What are the eigenvalues of A^T? Explain.

2. Exercise #21 on page 354 **except** use the following Leslie matrix
$$A = \begin{bmatrix} 0 & 0 & 0 & 6 \\ \frac{1}{3} & 0 & 0 & 0 \\ 0 & \frac{1}{\sqrt{2}} & 0 & 0 \\ 0 & 0 & \frac{1}{\sqrt{2}} & 0 \end{bmatrix}.$$

3. Exercise #T.6 on page 355

4. Let
$$A = \begin{bmatrix} 3 & 1 & 1 \\ 1 & 3 & 1 \\ 1 & 1 & 3 \end{bmatrix}.$$
   (a) Find all eigenvalues of A. Show your work.
   (b) Exhibit two <u>different</u> bases for $\mathbb{R}^3$ consisting solely of eigenvectors for A. Show your work.