# SAMPLE PAPER FOR ELA*

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**Abstract.** A good descriptive abstract is always very useful. The main results of the paper are explained here of course, if possible. It should be written in the third person!

**Key words.** Nonsingular matrices, Determinants, Spherical coordinates.

**AMS subject classifications.** 15A15, 15F10.

## 1. Introduction.

Each section starts with a `\section{name}` command. The label is used to refer to it in other sections. Definitions, lemmas, theorems, etc., are numbered consecutively within each section. Formulas are numbered on the left as in the following equation:

$$Ax = b, \tag{1.1}$$

where $A$ is $n \times n$.

Definition 1.1. A square matrix $A$ is said to be *nonsingular* if its columns are linearly independent.

Lemma 1.2. *If $A$ is $n \times n$ and nonsingular, the system* (1.1) *has a unique solution for any $b \in \mathbb{R}^n$.*

*Proof.* Consult any standard textbook (in linear algebra). □

Corollary 1.3. *If $A$ is $n \times n$ and singular, the system* (1.1) *may have more than one solution.*

Theorem 1.4. *Let $A$ be an $n \times n$ matrix. Then $\lim_{k\to\infty} A^k = O$ if and only if $\rho(A) < 1$.*

*Proof.* This is a well-known result; see e.g., Varga [2, Some result]. □

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**2. Another section.** A few more items worth reading before you prepare an ELA article.

REMARK 2.1.

- Remark and Definition contents are in roman font, while Lemma and Theorem statements are in italics.
- Note in the bibliography how a journal article like [1] is cited. The journal name should be either completely spelled out or, if abbreviated, the abbreviation should be the one used by *Mathematical Reviews* (`http://www.ams.org`). Consistency should be established in each paper: either all journal names are abbreviated, or none.
- Article [3] is an example of a cited ELA paper. The official abbreviation that can be used for ELA is *Electron. J. Linear Algebra*.
- Use the macros `\reals` to denote the real numbers $\mathbb{R}$ and `\complex` to denote the complex numbers $\mathbb{C}$.
- Square brackets `\left[` and `\right]` are preferred for arrays.
- Only formulas referenced in the text, such as (1.1) or (2.1) below, should be numbered; others can be included in the text or be displayed without numbers. Similarly, one expects a reference in the text to every item listed in the bibliography.
- When the end of a proof is a displayed formula, the end of the proof mark should be in the line of the formula. Use the `\cvd` macro as illustrated in Lemma 2.2.

LEMMA 2.2. *The off-diagonal entries of a* $2 \times 2$ *symmetric matrix are the same.*

*Proof.* The proof follows from the structure of the matrix, as follows:

$$A = \left[ \begin{array}{cc} a & b \\ b & c \end{array} \right]. \qquad \square \tag{2.1}$$

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REFERENCES

[1] Hans Schneider. Theorems on M-splittings of a singular M-matrix which depend on graph structure. *Linear Algebra and its Applications*, 58:407–424, 1984.

[2] Richard S. Varga. *Matrix Iterative Analysis*. Prentice-Hall, Englewood Cliffs, New Jersey, 1962.

[3] S. Friedland and H. Schneider. Spectra of expansion graphs. *Electronic Journal of Linear Algebra*, 6:2–10, 1999.