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SAMPLE PAPER FOR TMNA ON MAXIMAL IDEALS IN SUBALGEBRAS OF $C(X)$

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Abstract. In this paper we present the fundamental result of the fundamental theory.

1. Introduction

This sample paper illustrates the use of the AMSART document class version 2.20.1 with additional macros and modifications for the journal *Topological Methods in Nonlinear Analysis*. In this sample paper brief instructions to authors will be interspersed with mathematical text extracted from (purposely unidentified) published papers. For instructions on preparing mathematical text, the author is referred to *The Joy of TEX*, second edition, by Michael Spivak [12] and LATEX: *A Document Preparation System* by Leslie Lamport [13].

1.1. Top matter. The input format and content of the top matter can be best understood by examining the first part of the sample file **TMNA-L.tex**, up through the `\begin{document}` instruction.

The top matter includes both elements that must be input by the author and a few that are provided automatically. The author names and the title that are to appear in the running heads should be input between square brackets as

2010 *Mathematics Subject Classification.* Primary: 54C40, 14E20; Secondary: 46E25, 20C20.

Key words and phrases. Keyword1; keyword2; keywordx.

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an option to the `\author` and `\title` commands, respectively. The full names and title should be used unless they require too much space; in that event, abbreviated forms should be substituted. In the top matter, the title is input in caps and lowercase and will be set in all caps. The author names should be input in caps and lowercase; they will automatically be set in caps/small caps.

For each author an address should be input. The author's name should be input in upper and lowercase with a call to small caps (`\textsc{Author's Name}` or `{\sc Author's Name}`) preceding the text. The rest of the address information will default to roman type. The complete addresses for each author should be entered in the order that names appear on the title page. Addresses are considered part of the top matter but are set at the end of the paper following the references.

If an author's current address is different from the address where the research was carried out, then both addresses should be given with the current address second and coded as indicated in this sample file. Following these addresses, an electronic mail address should be given, if one exists.

Subject classifications (`\subjclass`) and acknowledgments (`\thanks`) are part of the top matter and will appear as unmarked footnotes at the bottom of the first page. Subject classifications (`\subjclass`) are required. Use the 1991 Mathematics Subject Classification that appears in annual indexes of *Mathematical Reviews* beginning in 1990. (The two-digit code from the Contents is not sufficient.)

Use `\thanks` for the footnotes that appear on the first page concerning any specific information the author wishes to convey. Refer to the example in this sample paper.

1.2. Fonts. The fonts used in this paper are from the Computer Modern family; they should be available to all authors preparing papers with these macros. However, the final copy may be set by the publisher using other fonts.

1.3. A mathematical extract. The mathematical content of this sample paper has been extracted from published papers, with no effort made to retain any mathematical sense. It is intended only to illustrate the recommended manner of input.

Mathematical symbols in text should always be input in math mode as illustrated in the following paragraph.

A function is invertible in $C(X)$ if it is never zero and in $C^*(X)$ if it is bounded away from zero. In an arbitrary $A(X)$, of course, there is no such description of invertibility which is independent of the structure of the algebra. Thus in §2 we associate to each noninvertible $f \in A(X)$ a z-filter $\mathcal{Z}(f)$ that is a measure of where f is "locally" invertible in $A(X)$. This correspondence extends to one between maximal ideals of $A(X)$ and z-ultrafilters on X. In §3 we use the filters $\mathcal{Z}(f)$ to describe the intersection of the free maximal ideals in any algebra $A(X)$. Finally, our main result allows us to introduce the notion of $A(X)$-compactness, of which compactness and realcompactness are special cases. In §4 we show how the Banach-Stone theorem extends to $A(X)$-compact spaces.

2. Theorems, lemmas, and other proclamations

Theorems and lemmas are varieties of `theorem` environments. In this document, a `theorem` environment called `lemma` has been created, which is used below. Also, there is a proof, which is in the predefined `pf` environment. The lemma and proof below illustrate the use of the `enumerate` environment.

LEMMA 2.1. *Let $f, g \in A(X)$, and let E, F be cozero sets in X.*

(1) *If f is E-regular and $F \subseteq E$, then f is F-regular.*
(2) *If f is E-regular and F-regular, then f is $E \cup F$-regular.*
(3) *If $f(x) \geq c > 0$ for all $x \in E$, then f is E-regular.*

PROOF. (1) Obvious.
(2) Let $h, k \in A(X)$ satisfy $hf|_E = 1$, and $kf|_F = 1$. Let $w = h + k - fhk$. Then $fw|_{E \cup F} = 1$.
(3) Let $h = \max\{c, f\}$. Then $h|_E = f|_E$, and $h \geq c$. So $0 < h^{-1} \leq c^{-1}$. Hence $h^{-1} \in C^*(X) \subseteq A(X)$, and $h^{-1}f|_E = 1$. □

Another `theorem`-type environment was defined at the beginning of this document, called `definition`. Here is an example of it:

DEFINITION 2.2. For $f \in A(X)$, we define

$$\mathcal{Z}(f) = \{E \in Z[X]\, f \text{ is } E^c\text{-regular}\}. \tag{2.1}$$

3. Roman type

Numbers, punctuation, (parentheses), [brackets], {braces}, and symbols used as tags should always be set in roman type. The following sample theorem illustrates how to code for roman type within the statement of a theorem.

THEOREM 3.1. *Let $\mathcal{G}$ be a free nilpotent-of-class-*2 *group of rank* ≥ 2 *with carrier G, and let*

$$m : G \times G \to Z$$

satisfy (2.21), (2.22), *and* (2.24), *and define κ by* (2.23). *Then this kappa-group is kappa-nilpotent of class* 2 *and kappa-metabelian, that is to say, it satisfies* S2 *and* S3, *but it is kappa-abelian if, and only if,*

$$m(x, y) = -1 \quad \textit{for all } x, y \notin G'. \tag{3.1}$$

(*Thus* (3.1) *implies the trivial consequence* (2.1).) *Now* $17'$*, however, is equivalent to a condition similar to* (2.25)*, namely,*

$$m(xz\sigma, yz\sigma) = m(x, y)\,. \tag{3.2}$$

Letters used as abbreviations rather than as variables or constants are set in roman type. Use the control sequences found in [12, p. 95] for common mathematical functions and operators like log and lim, and use `\cite` when citing a reference.

4. References

To produce a bibliography, use the environment named `thebibliography`. Input each reference as you would normally do in LaTeX [13]. Arrange the references in alphabetical order by the last name of the first-named author. The references at the end of this sample file have been chosen to illustrate the coding of the most common types of references. Use the abbreviations of names of journals as given in annual indexes of *Mathematical Reviews.*

The sample references have been labeled with numbers, using `\bibitem{...}`. To get letter labels, you can use, for example, `\bibitem[C1]{...}`.

References are set with hanging indentation. The widest label should be entered as the argument of the `thebibliography` environment, if you are not using BibTeX (which automatically determines the widest label). For example, a bibliography containing more than a hundred references would require three-digit number labels:

```
\begin{thebibliography}{000}
```

Both numbered and lettered references are printed with brackets around them.

5. Figures

Figures to be inserted later should be handled using LaTeX's `figure` environment. The amount of space left should equal the exact height of the figure. Extra space around the figure will be provided automatically. The positioning of figures may need to be changed to obtain the best possible page layout. Thus, it is important to label your figures and use the labels in the text when referring to figures. The figure caption should be positioned below the figure.

Authors must provide camera-ready copy of their figures drawn in black ink with clean, unbroken lines on nonabsorbent paper.

EXAMPLE 5.1. For the link in Figure 1, the Massey product $\langle u_1, u_2, u_3, u_4, u_5\rangle$ in $S^3 - L$ is defined and consists of all integer multiples of $\gamma_{1,5}$. For the link in Figure 2, the Massey product $\langle u_1, u_2, u_3, u_4, u_5\rangle$ in $S^3 - L$ contains the single element $\gamma_{1,5}$.

FIGURE 1. Only the word *figure* is set cap/small cap. Any other words are regular text.

FIGURE 2

6. Other headings

6.1. A subsection. We conclude by noting that another characterization of A-compactness follows from Mandelker. We call a family $\mathcal{S}$ of closed sets in X A-stable if every $f \in A(X)$ is bounded on some member of $\mathcal{S}$. Then one can show that a space is A-compact if and only if every A-stable family of closed sets with the finite intersection property has nonempty intersection.

6.1.1. A second-level subsection. This paragraph is included only to illustrate the appearance of a sub-subsection.

REFERENCES

[1] V. L. ARNOL′D, A. N. VARCHENKO, AND S. M. GUSEIN-ZADE, *Singularities of differentiable maps.* I, "Nauka", Moscow, 1982 (Russian); English transl. Birkhäuser, 1985.
[2] ———, *Singularities of differentiable maps.* II, "Nauka", Moscow, 1984; English transl., Birkhäuser, 1988.
[3] H. BASS, E. H. CONNELL, AND D. WRIGHT, *The Jacobian conjecture*, Bull. Amer. Math. Soc. **7** (1982), 287–330.
[4] H. BASS AND G. H. MEISTERS, *Polynomial flows in the plane*, Adv. in Math. **55** (1985), 173–203.
[5] B. COOMES, *Polynomial flows, symmetry groups, and conditions sufficient for injectivity of maps*, Ph.D. thesis, Univ. Nebraska-Lincoln, 1988.

[6] ———, *The Lorenz system does not have a polynomial flow*, J. Differential Equations (to appear).

[7] E. Formanek, *Generating the ring of matrix invariants*, Lecture Notes in Math., vol. 1197, Springer-Verlag, Berlin and New York, 1986, pp. 73–82.

[8] ———, *Polynomial flows on* $\mathbf{R}^n$, Proc. Semester on Dynamical Systems (Warsaw, Autumn 1986), Springer-Verlag, Berlin, Heidelberg, and New York (to appear).

[9] S. Osher, *Shock capturing algorithms for equations of mixed type*, Numerical Methods for Partial Differential Equations (S. I. Hariharan and T. H. Moulton, eds.), Longman, New York, 1986, pp. 305–322.

[10] L. A. Ostrovsky, *Nonlinear internal waves in a rotating ocean*, Part 2, Oceanology **18** (1978), 181–191.

[11] G. S. Petrov, *Elliptic integrals and their nonoscillatory behavior*, Funktsional. Anal. i Prilozhen. **20** (1986), 46–49; English transl. in Functional Anal. Appl. **20** (1986).

[12] M. D. Spivak, *The Joy of TEX*, second edition, Amer. Math. Soc., Providence, R. I., 1990.

[13] Leslie Lamport, *LATEX – A Document Preparation System*, Addison-Wesley, Reading, Mass., 1986.

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