Instructions for writing expository math paper

Your Name Here

Abstract

Write an abstract of less than 200 words that summarizes your topic and key results contained in the paper. The purpose of the abstract is to summarize what topic or issue your paper will discuss, together with any highlights of method, process or results.

Keywords: Mod arithmetic, relative primes, quaternions, quadratic residue.

Introduction

Each paper will typically be five to ten pages long. The exact length will depend on your topic and other details. The audience you are writing for is undergraduate math seniors, such as your classmates. You may assume the reader has some background in calculus, linear algebra, and other courses that EC math majors typically take by their senior year.

The introduction of your paper could discuss some of the background related to the topic you have chosen, including, for example, its connections to other areas of mathematics, and/or a brief history of when or why it was "invented," and/or sketch of key people who are major contributors to the topic. Be sure to cite needed references to support your claims.

Your introduction is also a good place to present some example or illustration that piques the reader's curiosity, such as those given in

> https://theoremoftheweek.wordpress.com/list-of-theorems/

Feel free to use the exact same examples you may find in your reference sources, as long as you paraphrase or quote, and clearly cite it. But, please avoid making quotes too large a part of your introduction.

The Senior Capstone Theory

This is a sample to show how to divide and subdivide your paper. References should be given in the form: see [1] for more details.

A primary goal of this paper is to explore your topic at the level of an introductory mathematical exposition. Typically that should include foundational material such as definitions, axioms, etc., as needed, followed by basic lemmas/ theorems and their proof.

Another key goal of the study is to explore an application area related to your topic. This part of the study should include key details that show how the mathematics connects with the application(s).

Since your paper may contain theorem(s) and/or other similar statements, here is a sample of how to do it in latex:

Theorem. *This is the statement of your theorem.*

If the statement is not easy to understand, be sure to define, clarify, and/or explain any key ideas related to understanding it. If appropriate, include a clear, readable proof of the theorem or, if the proof is too mathematically advanced, a discussion of the proof strategy. Here is one example of format for proofs:

Proof. Here is a proof of your theorem. Important results are illustrated in Figures 1.
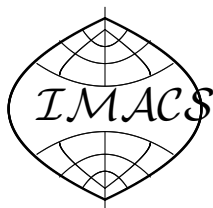□

Figure 1: Fancy IMACS seal

Use equations, sketches, tables, and examples, as needed, to help explain details about your topic.

Concluding remarks

The purpose of this section is to wrap things up, and/or briefly discuss other aspects related to your topic, its implications, its extensions, etc. For example, you could comment on some interesting theoretical consequences, or other later advances that evolved from this topic or this area of mathematics. Another option might be to summarize the major idea(s) that makes your topic and/or its application interesting. Feel free to keep this section brief, or to be more elaborate, as your understanding, appreciation and spirit guide you.

First subsection

This is a sample subsection. If you wish to use subsections in any of the above sections, please feel free to do so.

A note about this document

This whole document was written in latex, and mimics the recommended format for your paper. Please feel free to use the latex source of this document as template for writing your paper. I have made the source file available through the class website.

References

[1] Smith, D. N., Taylor, A. B., and Winton, R., Preconditioning techniques with applications, *Math. Comp.* **4** (1988), 229–242.

[2] Billingsley, P., *Probability and Measure*, 2nd ed., John Wiley, New York, 1986.