YOUR LONG TITLE

YOU

Abstract. Fill in when you know what you have.

1. Introduction

Give a brief statement of the problem, including its historical context and an overview of the major developments in its history, with references. For instance, the famous theorem in [B] was stated as only a conjecture in [Car], though in [Cas], Casselman claims it was actually proven by Gauss in [G]. All references in the bibliography must be cited at some point.

Provide a guide for the reader. In Section 2 we'll discuss some particular conventions for the writing of mathematical articles. In Section 3 we'll define the problem precisely and give a proof of the main result. We conclude in Section 4 with some examples and applications.

2. Mathematical Conventions

Most mathematical journals rely on authors to electronically submit their articles in LaTeX. The journals usually provide a *style file* which allows an author to easily recreate the "look and feel" of the particular journal. For this report, the default `amsart` documentclass will be fine.

We write math papers in first person plural, signifying "the author(s) and the reader together". Besides being a more natural writing style than the stiff formality of "one sees that" or "in this paper it is shown that", it tends to be a bit shorter.

Never start a sentence with a symbol. "x is a vector." This looks awful, is hard to read, and is never necessary. "We see that x is a vector." "Let x be a vector." "Therefore x is a vector."

In the same vein, every sentence should contain a verb and be readable out loud. Theorems and definitions should be introduced with complete sentences, not open-ended gaps like

Lemma 2.1. *That wasn't proper English. Remember that your reader may not use English as their first language, and so might find casual misuse of grammar or punctuation to be an obstacle in understanding your mathematics.*

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Key words and phrases. keywords.

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Math papers don't have a conclusion, even though articles in most other disciplines do. Instead, the introduction takes up the slack. So most articles will include in the introduction:

- a discussion of the context of the work;
- a statement of the main theorem or theorems;
- a discussion of related results in the literature; and
- a "roadmap" of the paper, detailing what will be found in each section.

For a paper whose goal is to present a new theorem, for example, the main body of the paper will have minimal discussion, in general, focussing instead on presenting the results and giving the proofs. Whereas the introduction may be packed with several disjoint things, the rest of the paper will be organized to flow as smoothly as possible.

When a new term is introduced, use *italics* (command: emph), not boldface or underlining. LaTeXhas several features to help typeset definitions or theorems consistently: `theoremstyle` commands. (See the preamble of this document for one set-up.)

Definition 2.2. There are many *environments* pre-defined in LaTeX, and many more you can create yourself. Some favourites for lists are

(1) itemize,
(2) enumerate, and
(3) description.

Theorem 2.3. *Footnotes are rarely used. References to the literature are made as they occur* [G]. *They should be made as specific as possible* [G, Thm3.3] *if the work is a long one.*

Proof. The bibliography should be typeset and arranged as uniformly as possible. Many different ways of citing a particular work may be acceptable; the key points are to identify: the author, the title of the work, the publisher, and the year. More detail is usually needed for articles in journals, such as volume or issue number. Book and journal titles may be put in *italics*, whereas article titles are "put in quotation marks". □

Cross-referencing within your article using the command `ref` can be very helpful to the reader. For example, refer to Theorem 2.3. You might refer to an equation in the flow of the text. For instance, suppose we have established that

$$3x - 4 = 2. \tag{2.1}$$

As we immediately deduce from Theorem 2.3, (2.1) implies that

$$x = 2.$$

Note that we didn't label this equation because we don't refer back to it.

More on labelling

Note that one can use "*" versions of most commands to suppress labelling, such as for this section heading, or for the first equation below. Equations can be typeset in line like $y = \int_a^b x\,dx$ or displayed like

$$y = \int_a^b x\,dx;$$

LaTeX automatically adjusts the symbols to be nice.

Other typical expressions in LaTeX include $x \in \mathbb{R}$, $\overline{x} \in \mathbb{C}$ and $\sin(x) = 1$. Note that I predefined $\mathbb{R}$ and $\mathbb{C}$ in the preamble to avoid extra typing.

3. Statement of the Problem

The most important problem in mathematics involves simplifying the expression

$$\sum_{i=1}^{n} i,$$

a problem famously solved by Gauss [G] at the age of six. His solution

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \tag{3.1}$$

is brilliant.

Next, we'd like to understand the nth term in a sequence $x_0, x_1, x_2, \ldots$, where $x_i = 4i^2 + 2$. We'll use (3.1).

4. Examples

There are many wonderful applications of number theory.

References

[B] R. U. Brilliant, "The Quadratic Form" in *Journal of Applied Number Theory*, Vol. 3, No. 2 (1998).

[Car] Cartier, P. Representations of p-adic groups: a survey. Automorphic forms, representations and L-functions (Proc. Sympos. Pure Math., Oregon State Univ., Corvallis, Ore., 1977), Part 1, pp. 111–155, Proc. Sympos. Pure Math., XXXIII, Amer. Math. Soc., Providence, R.I., 1979. MR0546593 (81e:22029)

[Cas] Casselman, W., Introduction to the theory of admissible representations of p-adic reductive groups, preprint.

[G] C. F. Gauss, *Brilliant Math*, Princeton University Press, 2002.

Your address

E-mail address: `Your email address`