Writing

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Structure of a Paper

- Abstract
- Introduction

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- Abstract
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- Development

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- Abstract
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- Development
- Aftermath

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- It is written last.

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- You should summarize your main results, and explain why they are significant. Usually this means that you must give some history or context, explaining the relation to earlier work.
- The introduction should be as self-contained as you can make it; it may be necessary to state your results in less than complete detail.

Introduction, ctd.

The introduction should contain as few definitions as possible.
Only definitions which are crucial to the understanding of your
main results should be included.

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- It is common to begin with a list of all the definitions you might need: this is a mistake. Here procrastination pays—defer the definition until you need it!
- Each section should begin with motivation, explaining the relation of the material included to the rest of the paper.

Aftermath

- In the final section, it is very useful to discuss where your work might lead.
  You may also discuss matters that you would have liked to mention in the introduction, but which would have required to many definitions at the time.

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  You may also discuss matters that you would have liked to mention in the introduction, but which would have required to many definitions at the time.
- In some areas (Computer Science, Physics) it is customary to offer a formal summary. It is not the custom in Mathematics.

Acknowledgements

Acknowledgements can be include in the final section, or at the end of the introduction. Except perhaps in long papers, I prefer the latter.

The Basic Problem. . .

. . . is to write in such a way that the reader feels that, behind the text, there is a friendly person trying to communicate.

A Bad Example

The fundamental notion is that of a von Neumann algebra. This is, typically, what may be called the 'symmetries of a group'. The precise way of saying this is that a (concrete) von Neumann algebra is nothing but a set of the form $M = \pi(G)'$ – where π is a unitary representation of a group G on a Hilbert space $\mathcal{H}$, and S' denotes, for S a subset of $\mathcal{L}(\mathcal{H})$ (the algebra of all bounded operators on $\mathcal{H}$), the commutant of S defined by $S' = \{x' \in \mathcal{L}(\mathcal{H}) : x'x = xx' \text{ for all } x \text{ in } S\}$. In other words M is the set of intertwiners of the representation π: thus, $x \in M \Leftrightarrow x\pi(g) = \pi(g)x$ for all g in G.

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Another Version

The fundamental notion is that of a von Neumann algebra. The basic example of this is $\mathcal{L}(\mathcal{H})$, the algebra of all bounded operators on $\mathcal{H}$. If π is a unitary representation of a group G, then a concrete von Neumann algebra is the set of elements of $\mathcal{L}(\mathcal{H})$ that commute with each of the operators $\pi(g)$, for g in G. Thus, if we define the commutant S' of a subset S of $\mathcal{L}(\mathcal{H})$ to be the set of operators that commute with each element of S, then a concrete von Neumann algebra is the commutant of $\pi(G)$.

▶ LATEX

No-one knows what the 'symmetries of a group' are! <kbd>◄ back</kbd>

This is nothing but annoying. (back)

This 'concrete' is paired with the second parenthetic phrase '(the algebra... on $\mathcal{H}$.)'

Who would have guessed? ◂ back

The 'where' serves notice that the authors have forgotten a definition, which should have been offered before it was used; here it comes. ◂ back

Here 'the commutant' refers back to something before the 'where' and the 'defined by' refers to something yet to come. Who could tell? ◂ back

For Beginners

The following advice is for those who have not used LATEX before.

On What?

LATEX runs on unix/linux, Macs and Windows. It is free. In all cases you need to choose an editor.

Macs

Use TeXShop. It has an excellent built-in editor which you might
as well use.

Windows

I do not have first-hand experience :-)
It seems that MiKTeX is the standard implementation. One
standard choice of editor is WinEdt.

Unix

Here LATEX is already installed; you will only need to choose an editor. If you have not yet made an emotional commitment, use Emacs. (I know a nice web page that instructs you how to get out of vi.)

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- Your file specifies a document class (e.g., article, letter, beamer, book) and this determines the basic format. The packages provide modifications to the basic format.

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- There is a nice one on the mac, and I assume there is something good on windows.
- On unix, the default is xfig. But life is too short for this. (A co-author may be useful here.)

The Arxiv

When you have a version of your paper that you are ready to submit, post it on the Math ArXiv (at http://arxiv.org/).

Submission

- Some journals permit or encourage electronic submission. For details, go to their web page and follow their instructions carefully.

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- Some journals permit or encourage electronic submission. For details, go to their web page and follow their instructions carefully.

- Some journals do not. If you submit by snail mail, include a covering letter! This should state that you are submitting the enclosed paper for publication, and in which journal.

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- Once you have submitted a paper, you cannot submit it to a second journal until it is rejected, or you have written to the journal and formally withdrawn it.

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- Your work builds on previous papers. Choose a journal where one of these appeared.

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- You can write at least one good paper in the time it can take to get a weak paper published.

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- Be aware that your paper may be sent to the same referee who rejected it before.

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- Usually the referees will have noted minor problems, and the editors will ask you to fix them and then resubmit.
- Sometimes a referee's comment may be wrong. You may choose to ignore it, but when you resubmit you should explain clearly where you have not followed the advice offered, and why.