IMRaD style

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Abstract

An abstract should give a short and interesting description of the contents of the document. You can add a table of contents to your document, by using the command "tableofcontents". Insert this command in your code, right after the abstract.

Contents

1 Introduction

When you use LaTeX there is no risk that a heading ends up at the bottom of a page and the text on the following one. Also observe that the first paragraph of a chapter or a section is never indented. If you type two or more spaces after one another like this: it will only be regarded as one.

A new paragraph is indicated by an empty row in the code and by a new row with indentation in the typesetted document. Two or more empty rows after one another will be regarded as one. As you can see, the first row of this paragraph is indented. The final result does not depend on where you insert new lines in the code.

In the quotation below I show how to do make references. See the list at the end of the paper. "The connections between number theory and physics have been much studied in recent years [1]. Two main directions in the research are zeta function techniques and p-adic numbers in high energy physics [2] and the Riemann zeta function as a source of inspiration in low-energy quantum chaos [3]."

1.1 An intermediate heading

A new section. Notice that LaTeX controls how headings are enumerated. Usually all enumerated headings will show up automatically in the table of contents. Usually subsections are longer than this one.

1.1.1 A subheading

The body text is typesetted with a straight right margin, and since the hyphenation works well in LaTeX, there will be no large gaps between the words on a row.

1.1.2 Yet another subheading

Footnotes should only be used in exceptional cases, even if they are easy to include.[1]

1.2 Next intermediate heading

Here we have moved up one level in the heading hierarchy. Notice that the heading is enumerated correctly by LaTeX.

1.2.1 The third subheading

If you want to emphasize something, like a word or a phrase, you could write it in *italics* or **boldface**. Other available fonts are *slanted*, SMALL CAPS, sans serif, and `typewriter`. It is also possible to modify the size of the text:

This sentence looks very strange!

Headings without numbers

If you wish to suppress the enumeration of a section, you add an asterisk directly after the section command. This also works for intermediate headings and subheadings. Headings without a number will not show up in the table of contents.

[1] This is a footnote.

2 More examples

We continue this overview by looking at more editorial structures and how one includes them in a LaTeX document.

2.1 Lists

A simple bulleted list:

- First item
- Second item
- Third item

An enumerated list with three sublists:

1. First item
2. The second item contains a sublist
   (a) The first item of the sublist contains in turn yet another sublist
      i. First item of the subsublist
      ii. Second item of the subsublist
   (b) Second item of the sublist
3. The third item consists of a longer text that will not end until later. Namely after the next sentence. This is the last sentence of this item.

It is possible to nest lists in at most four levels.

2.2 Formulae

A mathematical equation within a paragraph must be put between two dollar signs. An interesting equality is $e^{i\pi} + 1 = 0$. Any formula is read from the left to the right. The previous formula reads "e raised to i pi, plus one, equals zero". A few examples more: $f_n = f_{n-1} + f_{n-2}$ and $a^{(p-1)/2} \equiv 1 \pmod{p}$.

Equations, that are important or take too much space within a paragraph, should be displayed. Often you wish to refer to a equation later (or earlier) in the text. We can tell LaTeX to number such an equation in the right margin:

$$1 + 2 + 3 + \cdots + n = \frac{n(n+1)}{2}. \tag{1}$$

The equation (1) is well-known to mathematicians and is applied every now and then. If you don't want any number of the equation you write the command "nonumber" to the right in the equation. Don't forget the backslash

in front of it. Here comes yet another displayed equation, but this one has no number assigned to it:

$$\frac{\sin mx}{\sin x} = (-4)^{(m-1)/2} \prod_{j=1}^{(m-1)/2} \left(\sin^2 x - \sin^2 \frac{2\pi j}{m} \right).$$

It is even possible to make tables. The following table was valid as of August 23rd, 2012.

Name	**Country**	**Event**	**Result**
Therese Alshammar	Sweden	50 m butterfly	25.07
David Rudisha	Kenya	800 m	1:40.91
Jan Železný	Czech Republic	Javelin	98.48
Sergey Bubka	Ukraine	Pole vault	6.14

3 Results

I use eps format for plots but you can use pdf also but then you have to use another package. Important that eps-file lies in same folder as this tex-document.

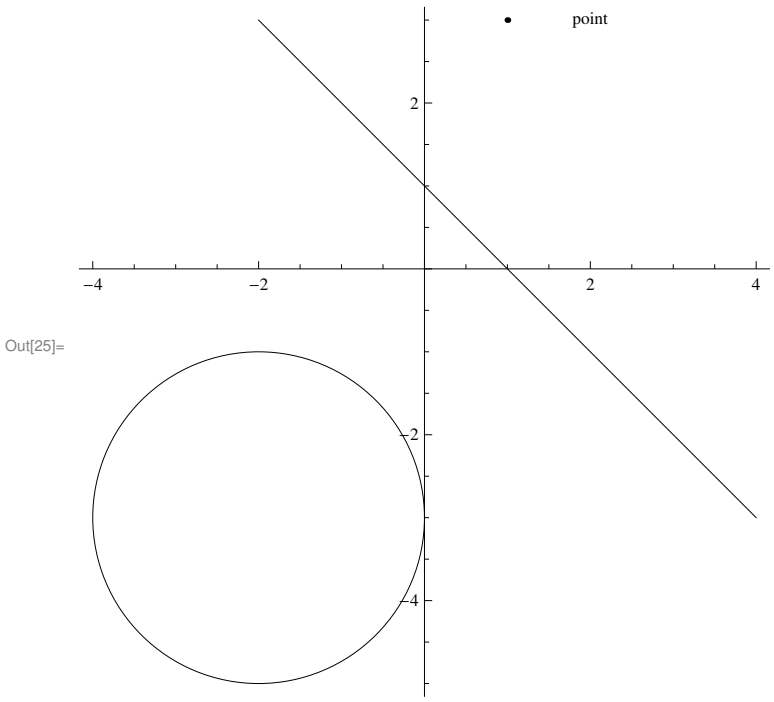

Figure 1: This figure illustrates three geometrical concepts. Point, circle and line. It is done with Graphics command in Mathematica.

There it came! Now we have a look at the second figure. Unfortunately it will not appear exactly where you want it to be. To get it on paper you

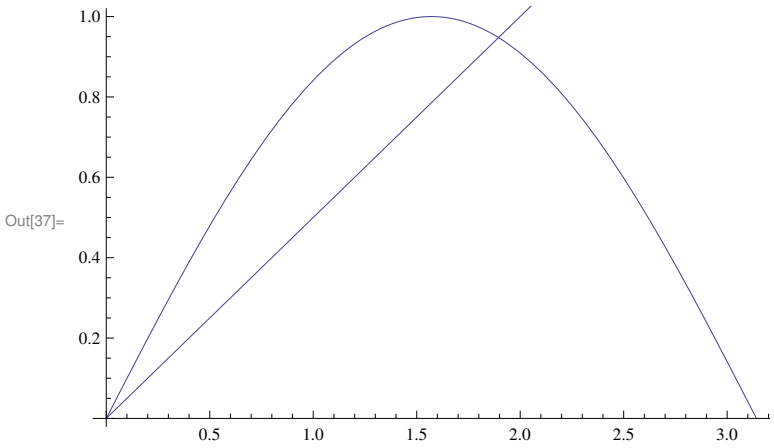

Figure 2: The curve is $\sin x$ and the line $\frac{x}{2}$. To solve the equation $\sin x = \frac{x}{2}$ a numerical method is needed.

use Build, or Build and View, in TeXnicCenter. If you have eps-files use LaTeX $\rightarrow$ PS $\rightarrow$ PDF in the box. LaTeX $\rightarrow$ PDF also works fine. Figure 2 came out below this text. Disturbed by Out sign to the very left in the plot? You can cut them in Mathematica. Do you want frame, axes labels etc for your plot? No problem, see Plot command in Mathematica. You write Plot, mark it with mouse and select Find Selected Function in the help menu.

4 Discussion

You end with a discussion and conclusions. When you compile your tex-file do it TWICE to get references etc right.

References

[1] L. Brekke and P. G. O. Freund, Phys. Rep. 233 (1993) 1-66; E. Elizalde, "Ten Physical Applications of Spectral Zeta Functions", Springer - Verlag, 1995.

[2] V. S. Vladimirov, I. V. Volovich and E. I. Zelenov, "P-adic Analysis and Mathematical Physics", World Scientific, 1995;

[3] M.Berry and J. Keating, Siam Review 41, (1999), 236-266.