My First LaTex Document

Michael Xu[1]

June 2024

Contents

Part I

First Part

Chapter 1

First Chapter

1.1 First Section

This is a simple paragraph at the beginning of the document. A brief introduction about the main subject.

After our abstract we can begin the first paragraph, then press "enter" twice to start the second one.

This line will start a second paragraph.

I will start the third paragraph and then add
a manual line break which causes this text to start on a new line but remains part of the same paragraph.

Alternatively, I can use the `\newline`
command to start a new line, which is also part of the same paragraph.

1.1.1 First Subsection

We have now added a title, author and date to our first LaTeX document! Some of the **greatest** discoveries in <u>science</u> were made by ***accident***. Some of the greatest *discoveries* in science were made by accident. *Some of the greatest* discoveries *in science were made by accident.*

Some of the greatest *discoveries* in science were made by accident.

how to include a picture:

```
\documentclass{article}
\usepackage{graphicx} %LaTeX package to import graphics
\graphicspath{{images/}} %configuring the graphicx package

\begin{document}
The universe is immense and it seems to be homogeneous,
on a large scale, everywhere we look.
```

Figure 1.1: A nice shot.

There's a picture of a galaxy above.

As you can see in figure 1.1, the function grows near the origin. This example is on page 8.

- he individual entries are indicated with a black dot, a so-called bullet.

- The text in the entries may be of any length.

1. he individual entries are indicated with a black dot, a so-called bullet.

2. The text in the entries may be of any length.

1.1.2   Second Subsection

1. he individual entries are indicated with a black dot, a so-called bullet.

2. The text in the entries may be of any length.

In physics, the mass-energy equivalence is stated by the equation $E = mc^2$, discovered in 1905 by $E = mc^2$ Albert Einstein. $E = mc^2$

1.2   Second Section

The mass-energy equivalence is described by the famous equation

$$E = mc^2$$

discovered in 1905 by Albert Einstein.

In natural units ($c = 1$), the formula expresses the identity

$$E = m \tag{1.1}$$

$$E = m \tag{1.2}$$

Subscripts in math mode are written as a_b and superscripts are written as a^b. These can be combined and nested to write expressions such as

$$T^{i_1 i_2 \ldots i_p}_{j_1 j_2 \ldots j_q} = T(x^{i_1}, \ldots, x^{i_p}, e_{j_1}, \ldots, e_{j_q})$$

We write integrals using $\int$ and fractions using $\frac{a}{b}$. Limits are placed on integrals using superscripts and subscripts:

$$\int_0^1 \frac{dx}{e^x} = \frac{e - 1}{e}$$

Lower case Greek letters are written as ω δ etc. while upper case Greek letters are written as Ω Δ.

Mathematical operators are prefixed with a backslash as $\sin(\beta)$, $\cos(\alpha)$, $\log(x)$ etc.

The well-known Pythagorean theorem $x^2 + y^2 = z^2$ was proved to be invalid for other exponents, meaning the next equation has no integer solutions for $n > 2$:

$$x^n + y^n = z^n$$

This is a simple math expression $\sqrt{x^2 + 1}$ inside text. And this is also the same: $\sqrt{x^2 + 1}$ but by using another command.

This is a simple math expression without numbering

$$\sqrt{x^2 + 1}$$

separated from text.

cell1	cell2	cell3	cell4
cell4	cell5	cell6	cell 7
cell17	cell8	cell9	cell 10

Table 1.1: Introduce to table.

1.3   Third Section

This is also the same:
$$\sqrt{x^2 + 1}$$

1.3.1   subsection

. . . and this:
$$\sqrt{x^2 + 1}$$

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisissem...

subsubsection

. . . and this:
$$\sqrt{x^2 + 1} \tag{1.3}$$

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisissem...

paragraph   Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi necante...

subparagraph   Praesent imperdietmi nec ante. Donec ullamcorper, felis non sodales...

1	2	3	4
5	6	7	8
9	1	2	3
4	5	6	7
8	9	1	2
3	4	5	6

Table 1.2: Table to test captions and labels.

Unnumbered Section

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisissem...

Table 1.2 shows how to add a table caption and reference a table.