# Contents

# List of Figures

# List of Tables

# 1 Heading 1

This is a section.

## 1.1 Sub Heading 1

And here we have reached a subsection under section 1.

## Sub Heading 2

This is an unnumbered section. This sentence shows the different formatting options: **bold**, *italic*, *emphasize*. You can also make text huge or small or any combination like **bold and large**.

# 2 Heading 2

This section contains examples of the most used environments.

## 2.1 Maths

There are two ways of included mathematical expression, in-line . Maths expressions enclosed in $ is used to create in-line maths. E.g. $c^2 = a^2 + b^2$.

Maths that does not need to be in-line can be typeset using the *equation* environment. For example:

$$\frac{df}{dx} = \lim_{\Delta x \to 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}, \tag{1}$$

if we wanted to add multiple equations that are aligned we use the *align* environment as follows:

$$\frac{d}{dx}(x + y)^2 = \frac{d}{dx}\left[x^2 + y^2 + 2xy\right],$$
$$= 2x + 2y. \tag{2}$$

as in other environments we can use the *label* command to refer to equations. As you can see in equations 1 and (2) typing maths in LaTeX is fun and easy.

## 2.2 Advanced maths

Latex can be used to generate various Greek letters, such as:

$$\begin{array}{cccc} \alpha & \beta & \gamma & \Gamma \\ \zeta & \psi & \chi & \nu \\ \tau & \varphi & \varepsilon & \lambda. \end{array}$$

There are also a number of integrals that can be defined in Latex:

$$\hat{F}(\omega) = \int_0^{2\pi} f(x)e^{2\pi i \omega x}dx. \tag{3}$$

$$A = \iint_S f(x,y)dS. \tag{4}$$

$$V = \iiint_V f(\mathbf{x}, \mathbf{y}, \mathbf{z})dV. \tag{5}$$

$$\oint_\gamma f(z)dz = 2\pi i \sum_{k=1}^{n} Res(f, a_k). \tag{6}$$

A number of differential operators are also available:

$$\left[\nabla^2 + k^2\right] p(x,y,t) = 0. \tag{7}$$

One can also use Latex to typeset matrices such as:

$$\begin{bmatrix} a11 & a12 & a13 \\ a21 & a22 & a23 \\ a31 & a32 & a33 \end{bmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} f1 \\ f2 \\ f3 \end{pmatrix} \tag{8}$$
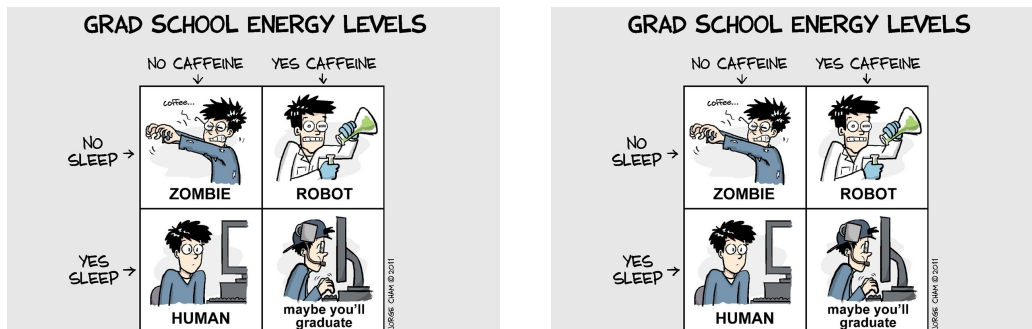
And some more advanced stuff [1]:

$$\sqrt{x} = \begin{cases} \mathbb{R} & \text{if } x \geq 0 \\ \mathbb{I} & \text{if } x < 0 \end{cases} \tag{9}$$

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[1]Hint: Look up the array and mathbb functions.

## 2.3 Figures

In LaTeX it also possible to create two figures next to each other, these are called sub figures.



(a) Caption on first figure
(b) Caption on second figure

Figure 1: These are funny pictures

References can be to the figure 1 or to the sub-figures 1a or 1b.

## 2.4 Lists

LaTeX also allows various ways to list text. They can either be numbered lists or unnumbered lists. An example of these are:

1. We have so far learnt how to structure a document.

2. How to format text.

3. How to use various math environments.

4. How to display graphics.

or in unnumbered fashion and multiple levels:

- We have so far learnt how to structure a document.
    - in sections
    - in subsections
    - in subsubsections
- How to format text.
    - in **bold**
    - in *italic*

– in *emphasize*

- How to use various math environments.

- How to display graphics.

## 2.5   Tables

LaTeX allows you you to include your hard earned data in tables such as:

Table 1: A table with useless info.

| S.No. | Price [$] | Stock |
|-------|-----------|-------|
| 1     | 200       | 5     |
| 2     | 65        | 7     |
| 3     | 198       | 8     |

For more LaTeX info see[1] and [2].

# References

[1] M. Goossens, F. Mittelbach, and A. Samarin, *The LaTeX Companion*. Reading, Massachusetts: Addison-Wesley, 1993.

[2] G. D. Greenwade, "The Comprehensive Tex Archive Network (CTAN)," *TUG-Boat*, vol. 14, no. 3, pp. 342–351, 1993.