# Learning LATEX by doing.

Dig03

November 5, 2019

# 1 General Initial Thoughts

Hello, world!

#### 1.1 Even More Specific Thoughts

Sometimes, I dream about cheese. Test indentation.

Test.

It's really nice cheese.

Wow this is working automatically - quite nice.

#### 1.1.1 Unreasonably Specific Thoughts

I think we've gone too deep.

A Paragraph This is a paragraph.

A Subparagraph This is a subparagraph.

## 2 Surprise Section

#### 3 Math environment features

#### 3.1 equation

$$f(x) = x^2 \tag{1}$$

# 3.2 equation\*

This environment is provided by the package 'amsmath', and removes automatic numbering.

$$f(x,y) = x^2 + y^2 + c$$

#### 3.3 align\*

This environment is needed for aligning multiple equations.

$$1 + 2 = 3$$
  
 $1 = 3 - 2$ 

Here we see that the equations are aligned such that the equalities are lined up. Equations are aligned at the ampers and (&). Equations are separated with linebreaks  $(\backslash\backslash)$ .

#### 3.4 Fractions and more

$$f(x) = x^{2}$$

$$g(x) = \frac{1}{x}$$

$$F(x) = \int_{b}^{a} \frac{1}{3}x^{3}$$

'int' here for integrals, and 'frac' for fractions. 'sqrt' also exists, and can be nested like so:

$$\frac{1}{\sqrt{x}}$$

More complicated expressions naturally become more error prone. Therefore you should take great care in opening and closing the braces ( $\{\}$ ). Much time may be wasted on debugging such errors. The Lyx program offers a great formula editor, which can ease this.

#### 3.5 Matrices

$$\begin{array}{cc} 1 & 0 \\ 0 & 1 \end{array}$$

Must be defined within a math environment (equation, equation, align, inline).

To surround the matrix by brackets we must use special statements. This ensures scaling works properly.

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

This also works for parentheses and braces and is not limited to matrices:

$$\left(\frac{1}{\sqrt{x}}\right)$$

# 4 Math Features (non-environment)

#### 4.1 Inline math

The following is an example of inline math:  $f(x) = x^2$ .

# 5 Figures and Images

The following requires the 'graphicx' package.

## 5.1 Figure environment



Figure 1: A boat.

Figure 1 shows a boat.

The 'float' can be set on figures. It consists of a couple possible values. h (here), t (top), b (bottom), p ([extra] page), ! (override), H (float package, stricter h!).

# 5.2 Subfigure environment

Usually you won't be adding single images, you'll want multiple to aid comparison. For this, you'll need a different environment called subfigure, provided by 'subcaption'.

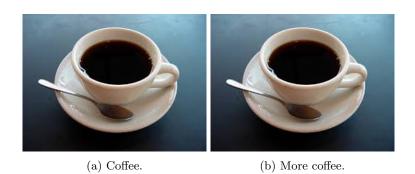


Figure 2: The same cup of coffee. Two times.

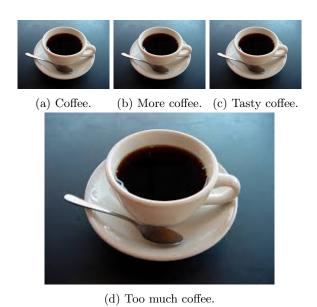


Figure 3: The same cup of coffee. Multiple times.