

# GSNS L<sup>A</sup>T<sub>E</sub>X course

T<sub>E</sub>XniCie

7 September 2021

# Schedule

- Introduction
- Text formatting
- Structure of a document
- 〈Exercises!〉
- Images
- Formulas
- 〈Exercises!〉
- Good to know

# L<sup>A</sup>T<sub>E</sub>X vs Word

My document

Lorem ipsum

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean commodo ligula eget dolor.  
 Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus  
 mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat massa  
 quis enim.

Donec pede justo

Fringilla vel, aliquet nec, vulputate eget, arcu. In enim justo, rhoncus ut, imperdiet a, venenatis vitae, justo.

Nullam dictum felis eu pede mollis pretium. Integer tincidunt.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

Cras dapibus. Vivamus elementum semper nisi. Aenean vulputate eleifend tellus. Aenean leo ligula, porttitor eu, consequat vitae, eleifend ac, enim. Aliquam lorem ante, dapibus in, viverra quis, feugiat a, tellus.



Figure 1: Bengoalse tüger

My document

Vincent Kuhlmann

3 May 2021

1 Lorem ipsum

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean commodo ligula eget dolor. Aenean  
 massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec  
 quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat massa quis enim.

### 1.1 Donec pede justo

Fringilla vel, aliquet nec, vulputate eget, arcu. In enim justo, rhoncus ut, imperdiet a, venenatis vitae, justo.

Nullam dictum felis eu pede mollis pretium. Integer tincidunt.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \quad (1)$$

Cras dapibus. Vivamus elementum semper nisi. Aenean vulputate eleifend tellus. Aenean leo ligula, porttitor eu, consequat vitae, eleifend ac, enim. Aliquam lorem ante, dapibus in, viverra quis, feugiat a, tellus.

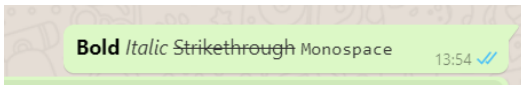
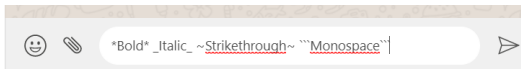


Figure 1: Bengalsse tiger



# Code vs Visual

- Websites & Apps  
**Complex**
- Wikipedia  
**Consistent**
- WhatsApp  
**Expandable**



# Code vs Visual

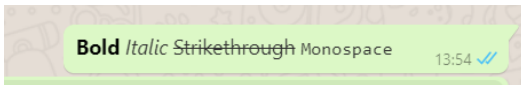
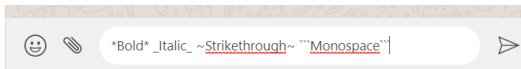
```
\begin{lemma}  
  Lorem ipsum dolor sit  
  ... eget dolor.  
  
  \begin{proof}  
    Aenean massa. Cum  
    ... quis enim.  
  \end{proof}  
\end{lemma}
```

**Lemma 1.9.** *Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean commodo ligula eget dolor.*

*Proof.* Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat massa quis enim.  $\square$

# Code vs Visual

- Websites & Apps  
**Complex**
- Wikipedia  
**Consistent**
- WhatsApp  
**Expandable**



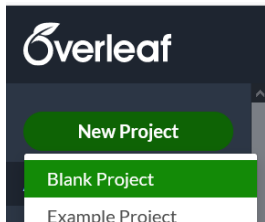
# Overleaf

**LaTeX** is the programming language.

**Overleaf** is a website where you can write and compile LaTeX.

**Visual Studio Code** is a desktop app where you can write and compile LaTeX.

**MiKTeX** does compilation for Visual Studio code.



For now: Overleaf.

Want VS Code? Instructions at  
[vkuhlmann.com/latex/installation](http://vkuhlmann.com/latex/installation)



# Simple document

```

\documentclass{article}
\usepackage[utf8]{inputenc}

\title{My document}
\author{Vincent Kuhlmann}
\date{1 May 2021}

\begin{document}
\maketitle
\section{Introduction}

Hello everyone!
\end{document}

```

My document

Vincent Kuhlmann

7 September 2021

## 1 Introduction

Hello everyone!

## Text effects

Result	Code	Result	Code
<b>Text</b>	<code>\textbf{Text}</code>	Text	<code>\texttt{Text}</code>
<i>Text</i>	<code>\textit{Text}</code>	Text	<code>{\tiny Text}</code>
TEXT	<code>\textsc{Text}</code>	Text	<code>{\LARGE Text}</code>
<u>Text</u>	<code>\underline{Text}</code>	Text <sup>1</sup>	<code>\textcolor{red}{Text}</code> <sup>1</sup>

Huge, huge, LARGE, Large, large, normalsize, small, footnotesize, scriptsize, tiny

---

<sup>1</sup>`\usepackage{xcolor}`

```

Lorem {ipsum \tiny dolor sit ame}t, consectetur
adipiscing elit. Phasellus {elementum}, lacus quis
tempus scelerisque, {elit diam vulputate ex, semper}
elementum massa odio in ante.
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Phasellus elementum, lacus quis tempus scelerisque, elit diam vulputate ex, semper elementum massa odio in ante.

Lorem ipsum \textbf dolor sit: Lorem ipsum **dolor** sit

Lorem ipsum \textbf{dolor} sit: Lorem ipsum **dolor** sit



# Paragraphs

```
...  
\usepackage{parskip}  
\begin{document}  
Lorem ipsum dolor sit amet,  
... ornare sit amet.  
  
In ipsum ante, sollicitudin  
... sit amet augue.  
\end{document}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer id erat leo. Suspendisse sit amet ligula turpis. Duis congue turpis odio, non ornare elit ornare sit amet.

In ipsum ante, sollicitudin at euismod vitae, tincidunt vitae massa. Aenean metus lectus, porta at tempor at, dapibus sit amet augue.

# Paragraphs

```
\noindent Lorem ipsum dolor  
sit amet, ... ornare sit  
amet.
```

```
In ipsum ante, sollicitudin  
... sit amet augue.
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer id erat leo. Suspendisse sit amet ligula turpis. Duis congue turpis odio, non ornare elit ornare sit amet.

In ipsum ante, sollicitudin at euismod vitae, tincidunt vitae massa. Aenean metus lectus, porta at tempor at, dapibus sit amet augue.

# Paragraphs

```
Lorem ipsum dolor sit amet,  
... ornare sit amet.
```

```
\vspace{1cm}
```

```
In ipsum ante, sollicitudin  
... sit amet augue.
```

(From now on, always \parskip)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer id erat leo. Suspendisse sit amet ligula turpis. Duis congue turpis odio, non ornare elit ornare sit amet.

In ipsum ante, sollicitudin at euismod vitae, tincidunt vitae massa. Aenean metus lectus, porta at tempor at, dapibus sit amet augue.

# Lists

These are the ingredients:

1. Carrots
2. Onions

Lipsum dolor sit amet.

3. Potatoes

```
These are the ingredients:
```

```
\begin{enumerate}
```

```
  \item Carrots
```

```
  \item Onions
```

```
  Lipsum dolor sit amet.
```

```
  \item Potatoes
```

```
\end{enumerate}
```



# Lists

These are the ingredients:

```
\begin{enumerate}
  \item Carrots
  \begin{enumerate}
    \item Buy
    \item Peel
    \item Chop
  \end{enumerate}
  \item Onions

  Lipsum dolor sit amet.
  \item Potatoes
\end{enumerate}
```

These are the ingredients:

1. Carrots

(a) Buy

(b) Peel

(c) Chop

2. Onions

Lipsum dolor sit amet.

3. Potatoes

# Lists

These are the ingredients:

```
\begin{itemize}
  \item Carrots
  \begin{enumerate}
    \item Buy
    \item Peel
    \item Chop
  \end{enumerate}
  \item Onions

  Lipsum dolor sit amet.
  \item Potatoes
\end{itemize}
```

These are the ingredients:

- Carrots

1. Buy

2. Peel

3. Chop

- Onions

Lipsum dolor sit amet.

- Potatoes

# Lists

These are the ingredients:

```
\begin{itemize}
  \item Carrots
  \begin{itemize}
    \item Buy
    \item Peel
    \item Chop
  \end{itemize}
  \item Onions
```

Lipsum dolor sit amet.

```
\item Potatoes
\end{itemize}
```

These are the ingredients:

- Carrots
  - Buy
  - Peel
  - Chop
- Onions

Lipsum dolor sit amet.

- Potatoes

## Special characters

Code	Result	Code	Result
<code>\{</code>	{	<code>{</code>	Begin group
<code>\}</code>	}	<code>}</code>	End group
<code>\%</code>	%	<code>%</code>	Comment
<code>\_</code>	–	<code>_</code>	Used in maths
<code>\textasciicircum</code>	^	<code>^</code>	Used in maths
<code>\\$</code>	\$	<code>\$</code>	Math mode
<code>\textbackslash</code>	\	<code>\</code>	Command
<code>\&amp;</code>	&	<code>&amp;</code>	Column separation
<code>\#</code>	#	<code>#</code>	Parameter
<code>\textgreater</code>	>	<code>&gt;</code>	i
<code>\textless</code>	<	<code>&lt;</code>	i

# Comments

```
% Make soul package work in beamer presentations
% Source: https://tex.stackexchange.com/...
\let\UL\ul
\makeatletter
\renewcommand\ul{
  \let\set@color\beamerorig@set@color
  \let\reset@color\beamerorig@reset@color
  \UL
}
...
```

# Comments

```
% TODO Translate to english
\section{Nonsense}

%Lorem ipsum dolor sit amet,
%\textfb{ornare} sit amet.
%
%\subsection{About  $\sqrt{2}$ }
```

## 1 Nonsense

## Quotes

'LaTeX' : 'LaTeX'

`LaTeX' : ‘LaTeX’

``LaTeX'' : “LaTeX”

# Whitespace

- `a_____b_c`
- `a\_\_\_\_\_\_b_c`
- `a\quad b c\,d\;e`
- `a\hspace{2cm}b`
- `\LaTeX` is cool!
- Vincent is a member of the `\TeX` niCie.
- `\LaTeX{}` is cool!

• `Hello ,_\my_\name  
is_\textellipsis.`

• `Hello ,_\my_\name%  
is_\textellipsis.`

`a b c.`

`a    b c.`

`a    b c d e`

`a                    b`

`\LaTeX` is cool!

Vincent is a member of the `\TeX` niCie.

`\LaTeX` is cool!

`Hello, my name is ...`

`Hello, my name is ...`



# Simple document

```
\documentclass{article}

\usepackage[utf8]{inputenc}

\title{My document}
\author{Vincent Kuhlmann}
\date{1 May 2021}
```

## Preamble

My document

Vincent Kuhlmann

1 May 2021

```
\begin{document}

\maketitle

\section{Introduction}

Hello everyone!

\end{document}
```

## Document

### 1 Introduction

Hallo iedereen!

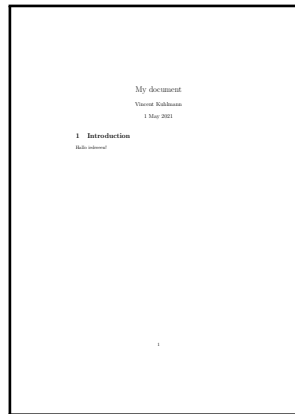
# Page margins

```
\documentclass{article}
\usepackage[utf8]{inputenc}

\title{My document}
\author{Vincent Kuhlmann}
\date{1 May 2021}

\begin{document}
  \maketitle
  \section{Introduction}

  Hello everyone!
\end{document}
```



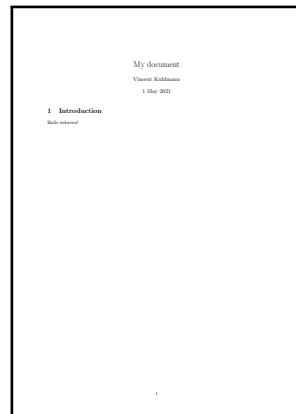
# Page margins

```
\documentclass[a4paper]{article}
\usepackage[utf8]{inputenc}
\usepackage[margin=2.54cm]{geometry}

\title{My document}
\author{Vincent Kuhlmann}
\date{1 May 2021}

\begin{document}
  \maketitle
  \section{Introduction}

  Hello everyone!
\end{document}
```



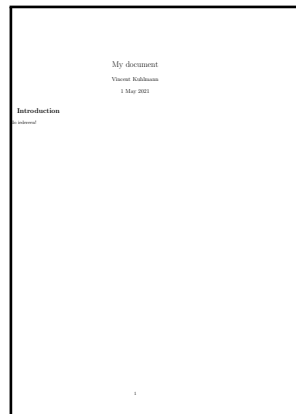
# Page margins

```
\documentclass[a4paper]{article}
\usepackage[utf8]{inputenc}
\usepackage[margin=2.54cm, left=-0.5cm]
{geometry}

\title{My document}
\author{Vincent Kuhlmann}
\date{1 May 2021}

\begin{document}
  \maketitle
  \section{Introduction}

  Hello everyone!
\end{document}
```



# Section commands

```
\section{AA}
```

```
Lorem ipsum dolor sit amet,  
consectetur adipiscing elit.
```

```
\section{BB}
```

```
\subsection{CC}
```

```
\subsubsection{DD}
```

```
\subsection{EE}
```

```
Nullam a risus at arcu  
lobortis viverra vel  
volutpat diam.
```

```
\section{FF}
```

```
\subsubsection{GG}
```

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

## 2 BB

### 2.1 CC

#### 2.1.1 DD

### 2.2 EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## 3 FF

### 3.0.1 GG

# Contents

```
\begin{document}
  \maketitle
  \tableofcontents

  \section{AA}
  ...
\end{document}
```

## Contents

<b>1</b>	<b>AA</b>	<b>1</b>
<b>2</b>	<b>BB</b>	<b>2</b>
2.1	CC . . . . .	2
	2.1.1 DD . . . . .	2
2.2	EE . . . . .	2
<b>3</b>	<b>FF</b>	<b>2</b>
	3.0.1 GG . . . . .	2

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

# Contents

```

\begin{document}
  \maketitle
  \tableofcontents
  \newpage

  \section{AA}
  ...
\end{document}

```

## Contents

<b>1</b>	<b>AA</b>	<b>2</b>
<b>2</b>	<b>BB</b>	<b>2</b>
2.1	CC . . . . .	2
2.1.1	DD . . . . .	2
2.2	EE . . . . .	2
<b>3</b>	<b>FF</b>	<b>2</b>
3.0.1	GG . . . . .	2

# Contents

```

...
\usepackage[dutch]{babel}

\begin{document}
  \maketitle
  \tableofcontents
  \newpage

  \section{AA}
  ...
\end{document}

```

## Inhoudsopgave

<b>1</b>	<b>AA</b>	<b>2</b>
<b>2</b>	<b>BB</b>	<b>2</b>
2.1	CC . . . . .	2
	2.1.1 DD . . . . .	2
2.2	EE . . . . .	2
<b>3</b>	<b>FF</b>	<b>2</b>
	3.0.1 GG . . . . .	2



# Partial numbering

```
\setcounter{secnumdepth}{3}
\section{AA}
Lorem ipsum dolor sit amet,
consectetur adipiscing elit.

\section{BB}
\subsection{CC}
\subsubsection{DD}
\subsection{EE}
Nullam a risus at arcu
lobortis viverra vel
volutpat diam.

\section{FF}
\subsubsection{GG}
```

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

## 2 BB

### 2.1 CC

#### 2.1.1 DD

### 2.2 EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## 3 FF

### 3.0.1 GG

# Partial numbering

```
\setcounter{secnumdepth}{2}
\section{AA}
Lorem ipsum dolor sit amet,
consectetur adipiscing elit.

\section{BB}
\subsection{CC}
\subsubsection{DD}
\subsection{EE}
Nullam a risus at arcu
lobortis viverra vel
volutpat diam.

\section{FF}
\subsubsection{GG}
```

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

## 2 BB

### 2.1 CC

DD

### 2.2 EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## 3 FF

GG

# Partial numbering

```
\setcounter{secnumdepth}{1}
\section{AA}
Lorem ipsum dolor sit amet,
consectetur adipiscing elit.

\section{BB}
\subsection{CC}
\subsubsection{DD}
\subsection{EE}
Nullam a risus at arcu
lobortis viverra vel
volutpat diam.

\section{FF}
\subsubsection{GG}
```

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

## 2 BB

CC

DD

EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## 3 FF

GG

# Partial numbering

```
\setcounter{secnumdepth}{0}  
\section{AA}  
Lorem ipsum dolor sit amet,  
consectetur adipiscing elit.  
  
\section{BB}  
\subsection{CC}  
\subsubsection{DD}  
\subsection{EE}  
Nullam a risus at arcu  
lobortis viverra vel  
volutpat diam.  
  
\section{FF}  
\subsubsection{GG}
```

## AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

## BB

### CC

#### DD

#### EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## FF

### GG

# Partial numbering

```
\section{AA}
```

Lorem ipsum dolor sit amet,  
consectetur adipiscing elit.

```
\section*{BB}
```

```
\subsection*{CC}
```

```
\subsubsection{DD}
```

```
\subsection*{EE}
```

Nullam a risus at arcu  
lobortis viverra vel  
volutpat diam.

```
\section{FF}
```

```
\subsubsection{GG}
```

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

### BB

#### CC

##### 1.0.1 DD

#### EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## 2 FF

##### 2.0.1 GG



```
\documentclass[a4paper]
{article}
```

```
\usepackage[margin=2.54cm]
{geometry}
\usepackage{parskip}
\usepackage{xcolor}
\usepackage{hyperref}
```

```
\setcounter{secnumdepth}
{1}
```

```
\section{AA}
\subsection{BB}
\subsubsection{CC}
\subsection*{BB}
\tableofcontents
\newpage
```

```
Lorem \textbf{ipsum}
\underline{dolor} \emph{sit}
amet.
```

```
Fusce \textcolor{red}
{ac risus} ...
```

## \includegraphics

Here you see a penguin:

```
\includegraphics[height=2cm]{penguin.jpg}
```

Photo by Sue Flood.



Here you see a penguin: Photo by Sue Flood.

<https://www.pinterest.co.kr/pin/645844402812554993/>



## \includegraphics

Here you see a penguin:

```
\includegraphics[height=2cm]{penguin.jpg}
```

Photo by Sue Flood.

---

Here you see a penguin:



Photo by Sue Flood.

## \includegraphics

Here you see a penguin:

```
\begin{center}
  \includegraphics[height=2cm]{penguin.jpg}
\end{center}
Photo by Sue Flood.
```

Here you see a penguin:



Photo by Sue Flood.

## \includegraphics

```
You can see a penguin in Figure~\ref{fig:penguin}.  
\begin{figure}[h]  
  \centering  
  \includegraphics[height=2cm]{penguin.jpg}  
  \caption{A cute penguin. Photo by Sue Flood.}  
  \label{fig:penguin}  
\end{figure}
```

You can see a penguin in Figure 1.



Figuur 1: A cute penguin. Photo by Sue Flood.

## Figure placement

- h (HERE): Figure can come here.
- t (TOP): Figure can come at the top of the page.
- b (BOTTOM): Figure can come at the bottom of the page
- p (PAGE): Figure can come on a special page for figures.
- H (HERE): No floating, always here. (`\usepackage{float}`)

Figure appearing too late? Try placing `figure` to a point earlier in the code.

When working with images: `\usepackage{graphicx}`

# Dimensions

- Full linewidth

```
\includegraphics[width=\linewidth]{assets/penguin.jpg}
```

- 90% linewidth

```
\includegraphics[width=0.9\linewidth]{assets/penguin.jpg}
```

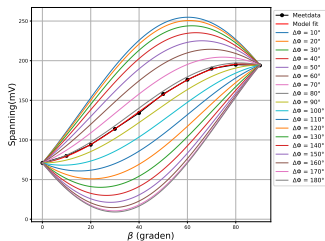
- Width maximally 90% linewidth and height maximally 5 cm

```
\includegraphics [  
    width=0.9\linewidth , height=5cm , keepaspectratio  
{assets/penguin.jpg}
```

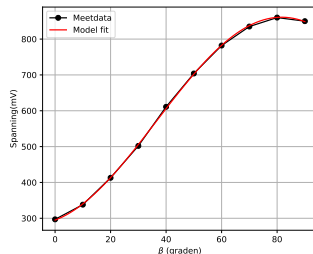
## Subfigure (`\usepackage{subcaption}`)

```
\begin{figure}[htbp]
  \centering
  \begin{subfigure}[b]{0.45\textwidth}
    \includegraphics[width=\textwidth]{AA}
    \caption{BB}
    \label{fig:dphiExample}
  \end{subfigure}\quad
  \begin{subfigure}[b]{0.45\textwidth}
    \includegraphics[width=\textwidth]{CC}
    \caption{CC}
    \label{fig:fitExample}
  \end{subfigure}
  \caption{Multiple images next to eachother!}
\end{figure}
```

# Subfigure (`\usepackage{subcaption}`)



(a) BB



(b) CC

Figuur 1: Multiple images next to eachother!

# Formulas

The trigonometric identity is  $\sin^2(\theta) + \cos^2(\theta) = 1$ .

The trigonometric identity  
is `$ \sin^2(\theta) + \cos^2(\theta) = 1 $`.

```
\usepackage{amsmath,amssymb}
\usepackage{commath,mathtools}
```



# Formulas: The basics

Formula	Code	Formula	Code
$\sqrt{2}$	<code>\$ \sqrt{2} \$</code>	$\sqrt[3]{8}$	<code>\$ \sqrt[3]{8} \$</code>
$\frac{2}{3}$	<code>\$ \frac{2}{3} \$</code>	$x_1$	<code>\$ x_1 \$</code>
$6 \geq 3$	<code>\$ 6 \geq 3 \$</code>	$x_1^2$	<code>\$ x_1^2 \$</code>
$a^2 + b^2$	<code>\$ a^2 + b^2 \$</code>	$a^{2+b^2}$	<code>\$ a^{2 + b^2} \$</code>

# Formulas: Symbols

Formula	Code	Formula	Code
$x_1, \dots, x_n$	<code>\$ x_1, \dots, x_n \$</code>	$5 \cdot 6$	<code>\$ 5\cdot 6 \$</code>
$\alpha, \beta, \gamma$	<code>\$ \alpha, \beta, \gamma \$</code>	$A, B, \Gamma$	<code>\$ A, B, \Gamma \$</code>
$\epsilon, \varepsilon$	<code>\$ \epsilon, \varepsilon \$</code>	$\mathcal{P}$	<code>\$ \mathcal{P} \$</code>
$\phi, \varphi$	<code>\$ \phi, \varphi \$</code>	$\mathbb{P}$	<code>\$ \mathbb{P} \$</code>

## Formulas: Vectors

Formule	Code	Formule	Code
$\vec{x}$	<code>\$ \vec{x} \$</code>	$\vec{F}_{\text{tot}}$	<code>\$ \vec{F}_{\text{\text{tot}}} \$</code>
$\mathbf{x}$	<code>\$ \mathbf{x} \$</code>	$\hat{i} + 6\hat{k}$	<code>\$ \hat{\imath} + 6\hat{k} \$</code>
$\ \vec{x}\ $	<code>\$ \norm{\vec{x}} \$</code>	$\nabla \times \mathbf{A}$	<code>\$ \nabla \times \mathbf{A} \$</code>

$$\vec{F}_{tot}, \vec{F}_{\text{tot}}$$

# Formulas: Calculus

```
\usepackage{commath}
```

```
\dod{\sin(x)}{x}, \dod{f(x,y)}{x}, \partial_x f
```

```
\int_{0}^{\infty} e^{-x} \dif x = 1
```

$$\frac{d \sin(x)}{dx}, \frac{\partial f(x,y)}{\partial x}, \partial_x f$$

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

# Formulas: Mathematical relations

Formula	Code	Formula	Code
$a \leq b$	<code>\$ a \leq b \$</code>	$a \geq b$	<code>\$ a \geq b \$</code>
$a < b$	<code>\$ a &lt; b \$</code>	$a > b$	<code>\$ a &gt; b \$</code>
$a \ll b$	<code>\$ a \ll b \$</code>	$a \gg b$	<code>\$ a \gg b \$</code>
$a = b$	<code>\$ a = b \$</code>	$a \simeq b$	<code>\$ a \simeq b \$</code>
$a \neq b$	<code>\$ a \neq b \$</code>	$a \approx b$	<code>\$ a \approx b \$</code>
$a \sim b$	<code>\$ a \sim b \$</code>	$a \stackrel{*}{=} b$	<code>\$ a \stackrel{*}{=} b \$</code>

# Formulas: Arrows and operators

```
\DeclareMathOperator{\Image}{Image}
```

```
a \iff b, a\implies b, a\mapsto b
\lim_{x\to 0}\frac{\sin(x)}{x} = 1
\Image(f) = \mathbb{R}_{\geq 0}
```

$$a \iff b, a \implies b, a \mapsto b$$

$$\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = 1$$

$$\text{Image}(f) = \mathbb{R}_{\geq 0}$$

So many! And there are lots more :-)

CTAN symbol list:

[http://mirrors.ctan.org/info/symbols/comprehensive/  
symbols-a4.pdf](http://mirrors.ctan.org/info/symbols/comprehensive/symbols-a4.pdf)

Detexify:

<http://detexify.kirelabs.org/classify.html>

# Equation

The trigonometric identity is

```
$ \sin^2(\theta) + \cos^2(\theta) = 1 $.
```

The trigonometric identity is

```
\begin{equation}
```

```
\sin^2(\theta) + \cos^2(\theta) = 1.
```

```
\end{equation}
```

De trigonometric identity is  $\sin^2(\theta) + \cos^2(\theta) = 1$ .

De trigonometric identity is

$$\sin^2(\theta) + \cos^2(\theta) = 1. \tag{1}$$



# Align

The double-angle formula can now be rewritten as

```
\begin{align}
\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\
&= 2\cos^2(\theta) - 1.
\end{align}
```

The double-angle formula can now be rewritten as

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta) \tag{1}$$

$$= 2\cos^2(\theta) - 1. \tag{2}$$

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# Align

```
The double-angle formula can now be rewritten as
\begin{align}
\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)
\nonumber\\
&= 2\cos^2(\theta) - 1.
\end{align}
```

The double-angle formula can now be rewritten as

$$\begin{aligned}\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\ &= 2\cos^2(\theta) - 1.\end{aligned}\tag{1}$$

# Align

The double-angle formula can now be rewritten as

```
\begin{align*}
\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\
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\end{align*}
```

The double-angle formula can now be rewritten as

$$\begin{aligned}\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\ &= 2\cos^2(\theta) - 1.\end{aligned}$$

# Align

The double-angle formula can now be rewritten as

```
\begin{align*}
\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\
&= 2\cos^2(\theta) - 1. \tag{$ * $}
\end{align*}
```

The double-angle formula can now be rewritten as

$$\begin{aligned}\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\ &= 2\cos^2(\theta) - 1.\end{aligned}\tag{*}$$

# Align

We do this with the double-angle formula

```
\begin{align*}
\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta),
\end{align*}
```

which we can rewrite as

```
\begin{align*}
&= \cos^2(\theta) - (1 - \cos^2(\theta))\\
&= 2\cos^2(\theta) - 1.
\end{align*}
```

We do this with the double-angle formula

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta),$$

which we can rewrite as

$$\begin{aligned} &= \cos^2(\theta) - (1 - \cos^2(\theta)) \\ &= 2\cos^2(\theta) - 1. \end{aligned}$$

# Align

We do this with the double-angle formula

```
\begin{align*}
\cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta), \\
\intertext{which we can rewrite as}
&= \cos^2(\theta) - (1 - \cos^2(\theta)) \\
&= 2\cos^2(\theta) - 1.
\end{align*}
```

We do this with the double-angle formula

$$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta),$$

which we can rewrite as

$$\begin{aligned} &= \cos^2(\theta) - (1 - \cos^2(\theta)) \\ &= 2\cos^2(\theta) - 1. \end{aligned}$$

## Also in use

```
AA \(\sqrt{2}\backslash)  
BB \[\sqrt{3}\backslash]  
CC $$ \sqrt{4} $$
```

AA  $\sqrt{2}$  BB

$\sqrt{3}$

CC

$\sqrt{4}$



# Left-right

```
\begin{align*}
&f(\sum_{i=1}^n x_i) \\
&f\left(\sum_{i=1}^n x_i\right)
\end{align*}
```

$$f\left(\sum_{i=1}^n x_i\right)$$

$$f\left(\sum_{i=1}^n x_i\right)$$

# Delimiter point

```
\begin{align*}
  \left.\left[x^2\right]\right|_{x=0}^{\phantom{x^2}\left|_{x=2}\right.} = 4
\end{align*}
```

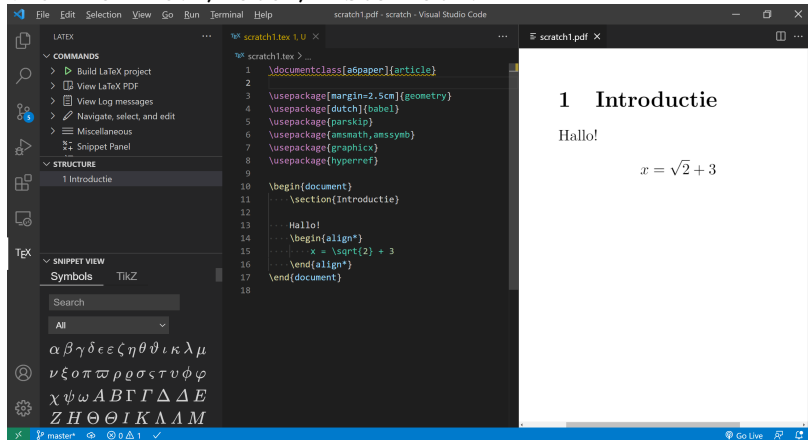
$$\left[x^2\right]\bigg|_{x=0}^{x=2} = 4,$$

```
\begin{align*}
R(\theta) &= \begin{pmatrix}
\cos(\theta) & -\sin(\theta) \\
\sin(\theta) & \cos(\theta)
\end{pmatrix}, \quad \text{quad} \\
\abs{x} &= \begin{cases}
x & \text{if } x \geq 0 \\
-x & \text{if } x < 0
\end{cases} \\
\end{align*}
```

$$R(\theta) = \begin{pmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{pmatrix}, \quad |x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

# Installation

[vkuehlmann.com/latex/installation](http://vkuehlmann.com/latex/installation)



On installed versions you might need to compile multiple times.

The end

Questions?

Stuck? Mail us at  
`texnicie@a-eskwadraat.nl`

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