# LaTeX-cursus

Vincent

25 september 2021

# Agenda

- Introductie
- Tekstopmaak
- Documentstructuur
- ⟨Oefeningen!⟩
- Afbeeldingen
- Formules
- ⟨Oefeningen!⟩
- Goed om te weten

# LaTeX vs Word

## My document

### Lorem ipsum

Lorem ipsum dolor sit amet, consectetuer 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: Bengaalse tijger*

My document

Vincent Kuhlmann

3 May 2021

## 1 Lorem ipsum

Lorem ipsum dolor sit amet, consectetuer 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.

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

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.

Figuur 1: Bengaalse tijger

# LaTeX vs Word

Onder de motorkap: groot verschil.
Word: Visueel, LaTeX: Code (tekst).

```
\title{My document}
\author{Vincent Kuhlmann}
\date{3 May 2021}

\begin{document}
\maketitle
\section{Lorem ipsum}
Lorem ipsum dolor sit amet, consectetue

\begin{align}
    f(x) = \dfrac{1}{\sigma\sqrt{2\pi}}
        -\frac{1}{2}\left(\frac{x-\mu}{
\end{align}
```

My document

Vincent Kuhlmann

3 May 2021

## 1 Lorem ipsum

Lorem ipsum dolor sit amet, consectetuer 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.

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

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.

Figuur 1: Bengaalse tijger

# Code vs Visueel

- Websites & Apps
  **Complex**

# Code vs Visueel

```
\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, consectetuer adipiscing elit. Aenean commodo ligula eget dolor.*

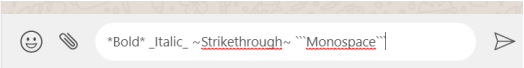
*Proof.* Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat massa quis enim. □

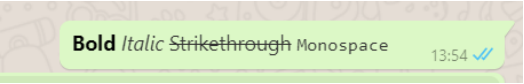
# Code vs Visueel

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

# Code vs Visueel

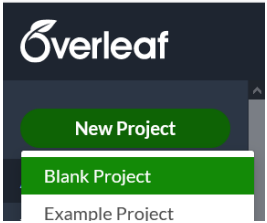
- Websites & Apps
  **Complex**
- Wikipedia
  **Consistent**
- WhatsApp
  **Uitbreidbaar**



# Overleaf

| |
|---|
| **LaTeX** is de codetaal die wij je aanleren om mooie bestanden met formules te maken. |
| **Overleaf** is een website waarop je LaTeX kan schrijven en het als PDF kan zien. |
| **TeXstudio** is een programma waarin je LaTeX kan schrijven en het als PDF kan zien. |
| **MiKTeX** is een hulpprograma die TeXstudio nodig heeft. |




Op het einde nog woordje hierover.
Voor nu: Overleaf.

Nu al niet-commerciële variant installeren?
`a-es2.nl/texnicie`

# Simpel document

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

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

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

Hallo iedereen!
\end{document}
```

My document

Vincent Kuhlmann

1 May 2021

## 1 Introduction

Hallo iedereen!

# Teksteffecten

| Resultaat | Code | Resultaat | Code |
|---|---|---|---|
| **Text** | | `Text` | |
| *Text* | | Text | |
| TEXT | | Text | |
| Text | | Text | |

# Teksteffecten

| Resultaat | Code | Resultaat | Code |
|---|---|---|---|
| **Text** | `\textbf{Text}` | Text | |
| *Text* | | Text | |
| TEXT | | Text | |
| Text | | Text | |

**bf** = **b**old**f**ace | **it** = **it**alics | **sc** = **s**mall**c**aps | **tt** = **t**ele**t**ype (a.k.a. monospace)

# Teksteffecten

| Resultaat | Code | Resultaat | Code |
|---|---|---|---|
| **Text** | `\textbf{Text}` | Text | `\texttt{Text}` |
| *Text* | `\textit{Text}` | Text | `{\tiny Text}` |
| TEXT | `\textsc{Text}` | Text | `{\LARGE Text}` |
| Text | `\underline{Text}` | Text | `\textcolor{red}{Text}` [1] |

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

[1] `\usepackage{xcolor}`

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

# Alinea's

```
m ipsum dolor sit amet,
ornare sit amet.
psum 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.

# Alinea's

```
m ipsum dolor sit amet,
ornare sit amet.
psum ante, sollicitudin
sit amet augue.
```

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

psum 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.

# Alinea's

```
m ipsum dolor sit amet,
ornare sit amet.
psum ante, sollicitudin
sit amet augue.
```

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

psum 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.

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.

# Alinea's

```
...
\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.

# Alinea's

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

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

# Alinea's

```
\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.

# Alinea's

```
m ipsum dolor sit amet,
ornare sit amet.
ace{1cm}

psum ante, sollicitudin
sit amet augue.
```

(Steeds parskip vanaf nu)

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.

# Lijsten

```
zijn de ingrediënten:
in{enumerate}
\item Wortels
\item Uien

Lipsum dolor sit amet.
\item Aardappelen
{enumerate}
```

Dit zijn de ingrediënten:

1. Wortels
2. Uien

   Lipsum dolor sit amet.

3. Aardappelen

# Lijsten

```
zijn de ingrediënten:
in{enumerate}
\item Wortels
\begin{enumerate}
    \item Kopen
    \item Raspen
    \item Fijnsnijden
\end{enumerate}
\item Uien

Lipsum dolor sit amet.
\item Aardappelen
{enumerate}
```

Dit zijn de ingrediënten:

1. Wortels
   (a) Kopen
   (b) Raspen
   (c) Fijnsnijden
2. Uien

   Lipsum dolor sit amet.
3. Aardappelen

# Lijsten

```
zijn de ingrediënten:
in{itemize}
\item Wortels
\begin{enumerate}
    \item Kopen
    \item Raspen
    \item Fijnsnijden
\end{enumerate}
\item Uien

Lipsum dolor sit amet.
\item Aardappelen
{itemize}
```

Dit zijn de ingrediënten:

- Wortels
  1. Kopen
  2. Raspen
  3. Fijnsnijden
- Uien

  Lipsum dolor sit amet.
- Aardappelen

# Lijsten

```
zijn de ingrediënten:
in{itemize}
\item Wortels
\begin{itemize}
    \item Kopen
    \item Raspen
    \item Fijnsnijden
\end{itemize}
\item Uien

Lipsum dolor sit amet.
\item Aardappelen
{itemize}
```

Dit zijn de ingrediënten:

- Wortels
  - Kopen
  - Raspen
  - Fijnsnijden
- Uien

  Lipsum dolor sit amet.
- Aardappelen

# Speciale tekens

| Code | Resultaat | Code | Resultaat |
|---|---|---|---|
| \{ | { | { | Begin groep |
| \} | } | } | Eindig groep |
| \% | % | % | Comment |
| _ | _ | _ | Betekenis voor wiskunde |
| \textasciicircum | ^ | ^ | Betekenis voor wiskunde |
| \$ | $ | $ | Wiskundemodus |
| \textbackslash | \ | \ | Commando |
| \& | & | & | Kolomscheiding |
| \# | # | # | Parameter |
| \textgreater | > | > | ¿ |
| \textless | < | < | ¡ |

# Speciale tekens

| Code | Resultaat | Code | Resultaat |
|---|---|---|---|
| \{ | { | { | Begin groep |
| \} | } | } | Eindig groep |
| \% | % | % | Comment |
| _ | _ | _ | Betekenis voor wiskunde |
| \textasciicircum | ^ | ^ | Betekenis voor wiskunde |
| \$ | $ | $ | Wiskundemodus |
| \textbackslash | \ | \ | Commando |
| \& | & | & | Kolomscheiding |
| \# | # | # | Parameter |
| \textgreater | > | > | ¿ |
| \textless | < | < | ¡ |

# 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 $\sqrt{2}$}
```

Error! Undefined control sequence

# Comments

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

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

## 1 Nonsense

# Comments

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

Lorem ipsum dolor sit amet,
\textfb{ornare} sit amet.

%\subsection{About $\sqrt{2}$}
```

Error! Undefined control sequence

# Comments

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

Lorem ipsum dolor sit amet,
\textbf{ornare} sit amet.

\subsection{About $\sqrt{2}$}
```

## 1 Nonsense

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

### 1.1 About $\sqrt{2}$

# Aanhalingstekens

`'LaTeX'` : 'LaTeX'

`` `LaTeX' `` : 'LaTeX'

`` ``LaTeX'' `` : "LaTeX"

# Spaties

- a␣␣␣␣b␣c

a b c.

# Spaties

- a␣␣␣␣b␣c
- a\␣\␣\␣\␣b␣c

a b c.

a b c.

# Spaties

- a␣␣␣␣b␣c — a b c.
- a\␣\␣\␣\␣b␣c — a b c.
- a\quad b c\,d\;e — a b c d e
- a\hspace{2cm}b — a b

# Spaties

- a␣␣␣␣b␣c — a b c.
- a\␣\␣\␣\␣b␣c — a b c.
- a\quad b c\,d\;e — a b c d e
- a\hspace{2cm}b — a b
- Ik kan \LaTeX schrijven! — Ik kan LaTeXschrijven!
- Vincent is lid van de \TeX niCie. — Vincent is lid van de TeXniCie.

# Spaties

| | |
|---|---|
| `a␣␣␣␣b␣c` | a b c. |
| `a\␣\␣\␣\␣b␣c` | a b c. |
| `a\quad b c\,d\;e` | a b c d e |
| `a\hspace{2cm}b` | a b |
| `Ik kan \LaTeX schrijven!` | Ik kan LaTeXschrijven! |
| `Vincent is lid van de \TeX niCie.` | Vincent is lid van de TeXniCie. |
| `Ik kan \LaTeX{} schrijven!` | Ik kan LaTeX schrijven! |

# Spaties

| | |
|---|---|
| a␣␣␣␣b␣c | a b c. |
| a\␣\␣\␣\␣b␣c | a b c. |
| a\quad b c\,d\;e | a b c d e |
| a\hspace{2cm}b | a b |
| Ik kan \LaTeX schrijven! | Ik kan LaTeXschrijven! |
| Vincent is lid van de \TeX niCie. | Vincent is lid van de TeXniCie. |
| Ik kan \LaTeX{} schrijven! | Ik kan LaTeX schrijven! |
| o␣ik<br>\textellipsis. | Hallo ik ben .... |
| o␣ik%<br>\textellipsis. | Hallo ikben .... |

# Simpel document

```latex
\documentclass{article}

\usepackage[utf8]{inputenc}

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

Preamble

My document

Vincent Kuhlmann

1 May 2021

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

Hallo iedereen!
\end{document}
```

1 Introduction

Hallo iedereen!

Document

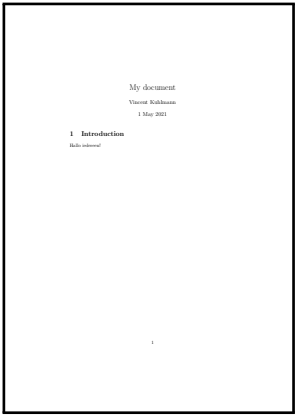
# Pagina marges

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

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

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

    Hallo iedereen!
\end{document}
```



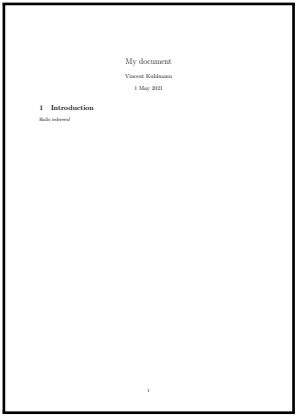
# Pagina marges

```
\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}

    Hallo iedereen!
\end{document}
```



# Pagina marges

```latex
\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}

    Hallo iedereen!
\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

# Inhoudsopgave

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

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

## Contents

**1 AA** **1**

**2 BB** **2**

2.1 CC . . . . . 2

2.1.1 DD . . . . . 2

2.2 EE . . . . . 2

**3 FF** **2**

3.0.1 GG . . . . . 2

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

# Inhoudsopgave

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

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

## Contents

**1 AA** **2**

**2 BB** **2**
2.1 CC . . . . . 2
2.1.1 DD . . . . . 2
2.2 EE . . . . . 2

**3 FF** **2**
3.0.1 GG . . . . . 2

# Inhoudsopgave

```
...
\usepackage[dutch]{babel}

\begin{document}
    \maketitle
    \tableofcontents
    \newpage

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

## Inhoudsopgave

**1 AA** **2**

**2 BB** **2**

2.1 CC . . . . . 2

2.1.1 DD . . . . . 2

2.2 EE . . . . . 2

**3 FF** **2**

3.0.1 GG . . . . . 2

# Gedeeltelijke nummering

```
\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

# Gedeeltelijke nummering

```
\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

# Gedeeltelijke nummering

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

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

\section{FF}
\subsubsubsection{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

# Gedeeltelijke nummering

```
\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

# Gedeeltelijke nummering

```
tion{AA}
m ipsum dolor sit amet,
ectetur adipiscing elit.

tion*{BB}
section*{CC}
subsection{DD}
section*{EE}
am a risus at arcu
rtis viverra vel
tpat diam.

tion{FF}
subsection{GG}
```

## 1 AA

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

## BB

## CC

### 1.0.1 DD

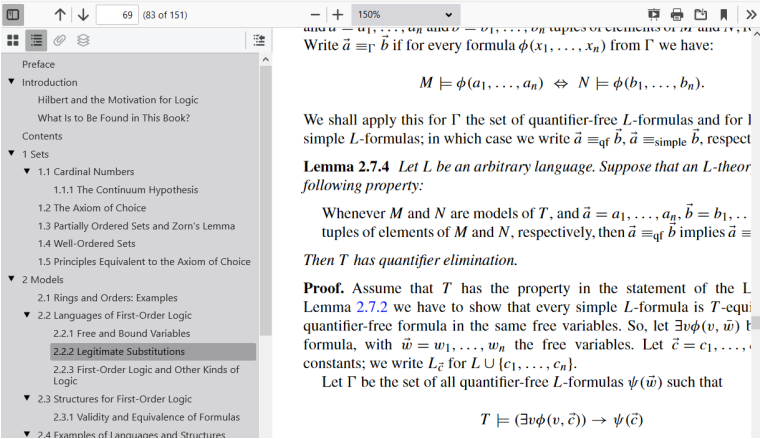
## EE

Nullam a risus at arcu lobortis viverra vel volutpat diam.

## 2 FF

### 2.0.1 GG

# Mijn favoriete package: `\usepackage[bookmarksnumbered]{hyperref}`



## \includegraphics

```
Hier zie je een pinguïn:
\includegraphics[height=2cm]{pinguin.jpg}
Foto door Sue Flood.
```

## \includegraphics

```
Hier zie je een pinguïn:
\includegraphics[height=2cm]{pinguin.jpg}
Foto door Sue Flood.
```

Hier zie je een pinguïn: Foto door Sue Flood.

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

## \includegraphics

```
Hier zie je een pinguïn:

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

Foto door Sue Flood.
```

Hier zie je een pinguïn:

Foto door Sue Flood.

## \includegraphics

```
Hier zie je een pinguïn:
\begin{center}
    \includegraphics[height=2cm]{pinguin.jpg}
\end{center}
Foto door Sue Flood.
```

Hier zie je een pinguïn:

Foto door Sue Flood.

## \includegraphics

```
Een pinguïn zie je in Figure~\ref{fig:pinguin}.
\begin{figure}[h]
    \centering
    \includegraphics[height=2cm]{pinguin.jpg}
    \caption{Een schattige pinguïn. Foto door Sue Flood.}
    \label{fig:pinguin}
\end{figure}
```

Een pinguïn zie je in Figuur 1.

Figuur 1: Een schattige pinguïn. Foto door Sue Flood.

# Figure placement

- h (HERE): Figuur mag hier.
- t (TOP): Figuur mag bovenaan een pagina.
- b (BOTTOM): Figuur mag onderaan een pagina.
- p (PAGE): Figuur mag op aparte pagina voor figuren.
- H (HERE): Geen floating, altijd hier. (`\usepackage{float}`)

Te laat in output? Verplaats `figure` naar voren in je bestand.

# Figure placement

- h (HERE): Figuur mag hier.
- t (TOP): Figuur mag bovenaan een pagina.
- b (BOTTOM): Figuur mag onderaan een pagina.
- p (PAGE): Figuur mag op aparte pagina voor figuren.
- H (HERE): Geen floating, altijd hier. (`\usepackage{float}`)

Te laat in output? Verplaats `figure` naar voren in je bestand.
When working with images: `\usepackage{graphicx}`

# Dimensions

- Hele regelbreedte

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

- 90% regelbreedte

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

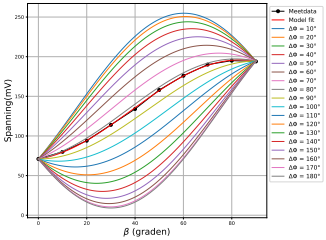
- Maximaal 90% regelbreedte en maximaal 5 cm hoog

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

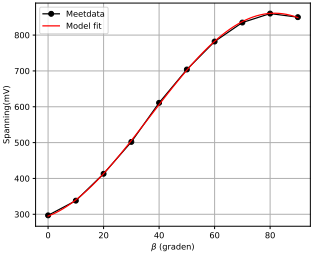
# Subfigure (\usepackage{subcaption})

```
\begin{figure}[htbp]
    \centering
    \begin{subfigure}[b]{0.45\textwidth}
        \includegraphics[width=\textwidth]{AA}
        \caption{BB}
        \label{fig:dphiExample}
    \end{subfigure}\qquad
    \begin{subfigure}[b]{0.45\textwidth}
        \includegraphics[width=\textwidth]{CC}
        \caption{CC}
        \label{fig:fitExample}
    \end{subfigure}
    \caption{Meerdere afbeeldingen naast elkaar!}
\end{figure}
```

# Subfigure (\usepackage{subcaption})




(a) BB




(b) CC

Figuur 1: Multiple images next to eachother!

# Formules

De trigonometrische identiteit is $\sin^2(\theta) + \cos^2(\theta) = 1$.

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De trigonometrische identiteit is $\sin^2(\theta) + \cos^2(\theta) = 1$.

```
De trigonometrische identiteit
is $ \sin^2(\theta) + \cos^2(\theta) = 1 $.
```

# Formules

De trigonometrische identiteit is $\sin^2(\theta) + \cos^2(\theta) = 1$.

```
De trigonometrische identiteit
is $ \sin^2(\theta) + \cos^2(\theta) = 1 $.
```

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

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | $ $ | $\sqrt[3]{8}$ | $ $ |
| $\frac{2}{3}$ | $ $ | $x_1$ | $ $ |
| $6 \geq 3$ | $ $ | $x_1^2$ | $ $ |
| $a^2 + b^2$ | $ $ | $a^{2+b^2}$ | $ $ |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ $` |
| $\frac{2}{3}$ | `$ $` | $x_1$ | `$ $` |
| $6 \geq 3$ | `$ $` | $x_1^2$ | `$ $` |
| $a^2 + b^2$ | `$ $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ $` |
| $6 \geq 3$ | `$ $` | $x_1^2$ | `$ $` |
| $a^2 + b^2$ | `$ $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ $` |
| $a^2 + b^2$ | `$ $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ \sqrt[3]{8} $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ \sqrt[3]{8} $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ x_1 $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ \sqrt[3]{8} $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ x_1 $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ x_1^2 $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ \sqrt[3]{8} $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ x_1 $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ x_1^2 $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ a^{2 + b^2} $` |

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ \sqrt[3]{8} $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ x_1 $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ x_1^2 $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ a^{2 + b^2} $` |

`$ x^22 $`: $x^22$

# Formules: Basis

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\sqrt{2}$ | `$ \sqrt{2} $` | $\sqrt[3]{8}$ | `$ \sqrt[3]{8} $` |
| $\frac{2}{3}$ | `$ \frac{2}{3} $` | $x_1$ | `$ x_1 $` |
| $6 \geq 3$ | `$ 6\geq 3 $` | $x_1^2$ | `$ x_1^2 $` |
| $a^2 + b^2$ | `$ a^2 + b^2 $` | $a^{2+b^2}$ | `$ a^{2 + b^2} $` |

`$ x^22 $`: $x^22$ | `$ x^{22} $`: $x^{22}$

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | $ $x_1, \ldots, x_n$ $ | $5 \cdot 6$ | $ $5 \cdot 6$ $ |
| $\alpha, \beta, \gamma$ | $ $\alpha, \beta, \gamma$ $ | $A, B, \Gamma$ | $ $A, B, \Gamma$ $ |
| $\epsilon, \varepsilon$ | $ $\epsilon, \varepsilon$ $ | $\mathcal{P}$ | $ $\mathcal{P}$ $ |
| $\phi, \varphi$ | $ $\phi, \varphi$ $ | $\mathbb{P}$ | $ $\mathbb{P}$ $ |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ $` |
| $\alpha, \beta, \gamma$ | `$ $` | $A, B, \Gamma$ | `$ $` |
| $\epsilon, \varepsilon$ | `$ $` | $\mathcal{P}$ | `$ $` |
| $\phi, \varphi$ | `$ $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ $` |
| $\epsilon, \varepsilon$ | `$ $` | $\mathcal{P}$ | `$ $` |
| $\phi, \varphi$ | `$ $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ $` |
| $\epsilon, \varepsilon$ | `$ \epsilon,\varepsilon $` | $\mathcal{P}$ | `$ $` |
| $\phi, \varphi$ | `$ $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ $` |
| $\epsilon, \varepsilon$ | `$ \epsilon,\varepsilon $` | $\mathcal{P}$ | `$ $` |
| $\phi, \varphi$ | `$ \phi,\varphi $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ 5\cdot 6 $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ $` |
| $\epsilon, \varepsilon$ | `$ \epsilon,\varepsilon $` | $\mathcal{P}$ | `$ $` |
| $\phi, \varphi$ | `$ \phi,\varphi $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ 5\cdot 6 $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ A,B,\Gamma $` |
| $\epsilon, \varepsilon$ | `$ \epsilon,\varepsilon $` | $\mathcal{P}$ | `$ $` |
| $\phi, \varphi$ | `$ \phi,\varphi $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ 5\cdot 6 $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ A,B,\Gamma $` |
| $\epsilon, \varepsilon$ | `$ \epsilon,\varepsilon $` | $\mathcal{P}$ | `$ \mathcal{P} $` |
| $\phi, \varphi$ | `$ \phi,\varphi $` | $\mathbb{P}$ | `$ $` |

# Formules: Symbolen

| Formule | Code | Formule | Code |
|---|---|---|---|
| $x_1, \ldots, x_n$ | `$ x_1,\dots,x_n $` | $5 \cdot 6$ | `$ 5\cdot 6 $` |
| $\alpha, \beta, \gamma$ | `$ \alpha,\beta,\gamma $` | $A, B, \Gamma$ | `$ A,B,\Gamma $` |
| $\epsilon, \varepsilon$ | `$ \epsilon,\varepsilon $` | $\mathcal{P}$ | `$ \mathcal{P} $` |
| $\phi, \varphi$ | `$ \phi,\varphi $` | $\mathbb{P}$ | `$ \mathbb{P} $` |

# Formules: Vectoren

| Formule | Code | Formule | Code |
|---|---|---|---|
| $\vec{x}$ | `$ \vec{x} $` | $\vec{F}_{\text{tot}}$ | `$ \vec{F}_{\text{tot}} $` |
| $\mathbf{x}$ | `$ \mathbf{x} $` | $\hat{\imath} + 6\,\hat{k}$ | `$ \hat{\imath} + 6\,\hat{k} $` |
| $\lVert\vec{x}\rVert$ | `$ \norm{\vec{x}} $` | $\nabla \times \mathbf{A}$ | `$ \nabla\times\mathbf{A} $` |

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

# Formules: Integraalrekening

```
\usepackage{commath}
```

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

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

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

$$\int_0^\infty e^{-x}\,\mathrm{d}x = 1$$

# Formules: Wiskundige relaties

| Formule | Code | Formule | Code |
|---|---|---|---|
| $a \leq b$ | `$ a \leq b $` | $a \geq b$ | `$ a \geq b $` |
| $a < b$ | `$ a < b $` | $a > b$ | `$ a > b $` |
| $a \ll b$ | `$ a \ll b $` | $a \gg b$ | `$ a \gg b $` |
| $a = b$ | `$ a = b $` | $a \simeq b$ | `$ a \simeq b $` |
| $a \neq b$ | `$ a \neq b $` | $a \approx b$ | `$ a \approx b $` |
| $a \sim b$ | `$ a \sim b $` | $a \stackrel{*}{=} b$ | `$ a \stackrel{*}{=}b $` |

# Formules: Pijltjes en operatoren

```
\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}
```

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

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

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

Zo veel! En nog veel meer :-)

CTAN symbolenlijst:
`http://mirrors.ctan.org/info/symbols/comprehensive/symbols-a4.pdf`

Detexify:
`http://detexify.kirelabs.org/classify.html`

# Equation

```
De trigonometrische identiteit is
$ \sin^2(\theta) + \cos^2(\theta) = 1 $.

De trigonometrische identiteit is
\begin{equation}
    \sin^2(\theta) + \cos^2(\theta) = 1.
\end{equation}
```

De trigonometrische identiteit is $\sin^2(\theta) + \cos^2(\theta) = 1$.

De trigonometrische identiteit is

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

# Align

```
De verdubbelingsformule herschrijven we nu als
\begin{align}
    \cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)\\
    = 2\cos^2(\theta)-1.
\end{align}
```

De verdubbelingsformule herschrijven we nu als

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

# Align

```
De verdubbelingsformule herschrijven we nu als
\begin{align}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\
    &= 2\cos^2(\theta)-1.
\end{align}
```

De verdubbelingsformule herschrijven we nu als

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

# Align

```
De verdubbelingsformule herschrijven we nu als
\begin{align}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)
    \nonumber\\
    &= 2\cos^2(\theta)-1.
\end{align}
```

De verdubbelingsformule herschrijven we nu als

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

# Align

```
De verdubbelingsformule herschrijven we nu als
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\
    &= 2\cos^2(\theta)-1.
\end{align*}
```

De verdubbelingsformule herschrijven we nu als

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

# Align

```
De verdubbelingsformule herschrijven we nu als
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta)\\
    &= 2\cos^2(\theta)-1. \tag{$ * $}
\end{align*}
```

De verdubbelingsformule herschrijven we nu als

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

# Align

```
Dit doen we met de verdubbelingsformule
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta),
\end{align*}
die we kunnen herschrijven als
\begin{align*}
    &= \cos^2(\theta) - (1 - \cos^2(\theta))\\
    &= 2\cos^2(\theta)-1.
\end{align*}
```

Dit doen we met de verdubbelingsformule

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

die we kunnen herschrijven als

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

# Align

```
Dit doen we met de verdubbelingsformule
\begin{align*}
    \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta),
\intertext{die we kunnen herschrijven als}
    &= \cos^2(\theta) - (1 - \cos^2(\theta))\\
    &= 2\cos^2(\theta)-1.
\end{align*}
```

Dit doen we met de verdubbelingsformule

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

die we kunnen herschrijven als

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

# Also in use

```
AA \(\sqrt{2}\)
BB \[\sqrt{3}\]
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*}
```

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

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

# Delimiter point

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

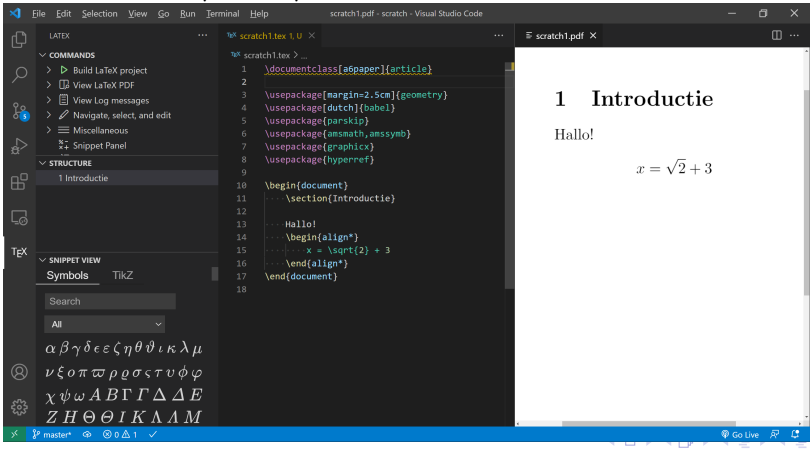
$$\left.\left[x^2\right]\right|_{x=0}^{x=2} = 4,$$

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

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

# Installatie

vkuhlmann.com/latex/installation



Op installaties meermaals compileren.

# The end

## Vragen?

Loop je vast? Mail ons op
`texnicie@a-eskwadraat.nl`