

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!

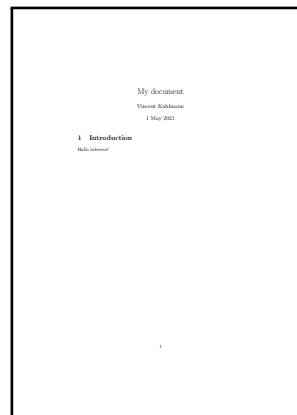
Page margins

```
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\end{document}
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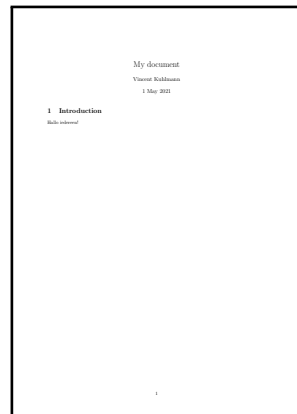
Page margins

```
\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}
```



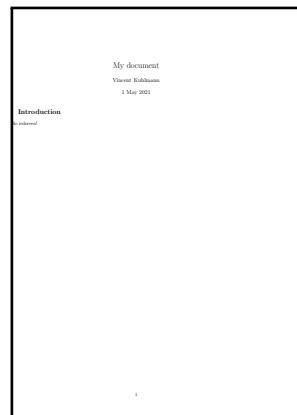
Page margins

```
\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

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

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

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

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Contents

```
\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

Contents

```
...  
\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

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

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GG

Partial numbering

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tion*{BB}  
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section*{EE}  
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tpat diam.
```

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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

My favorite package: `\usepackage[bookmarksnumbered]{hyperref}`

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Preface

- Introduction
 - Hilbert and the Motivation for Logic
 - What Is to Be Found in This Book?
- Contents
- 1 Sets
 - 1.1 Cardinal Numbers
 - 1.1.1 The Continuum Hypothesis
 - 1.2 The Axiom of Choice
 - 1.3 Partially Ordered Sets and Zorn's Lemma
 - 1.4 Well-Ordered Sets
 - 1.5 Principles Equivalent to the Axiom of Choice
- 2 Models
 - 2.1 Rings and Orders: Examples
 - 2.2 Languages of First-Order Logic
 - 2.2.1 Free and Bound Variables
 - 2.2.2 Legitimate Substitutions
 - 2.2.3 First-Order Logic and Other Kinds of Logic
 - 2.3 Structures for First-Order Logic
 - 2.3.1 Validity and Equivalence of Formulas
 - 2.4 Examples of Languages and Structures

and $a = a_1, \dots, a_n$ and $b = b_1, \dots, b_n$ tuples of elements of M and N , respectively. Write $\vec{a} \equiv_{\Gamma} \vec{b}$ if for every formula $\phi(x_1, \dots, x_n)$ from Γ we have:

$$M \models \phi(a_1, \dots, a_n) \Leftrightarrow N \models \phi(b_1, \dots, b_n).$$

We shall apply this for Γ the set of quantifier-free L -formulas and for L simple L -formulas; in which case we write $\vec{a} \equiv_{\text{qf}} \vec{b}$, $\vec{a} \equiv_{\text{simple}} \vec{b}$, respectively.

Lemma 2.7.4 *Let L be an arbitrary language. Suppose that an L -theory T has the property:*

Whenever M and N are models of T , and $\vec{a} = a_1, \dots, a_n$, $\vec{b} = b_1, \dots, b_n$ tuples of elements of M and N , respectively, then $\vec{a} \equiv_{\text{qf}} \vec{b}$ implies $\vec{a} \equiv \vec{b}$.

Then T has quantifier elimination.

Proof. Assume that T has the property in the statement of the Lemma 2.7.2 we have to show that every simple L -formula is T -equivalent to a quantifier-free formula in the same free variables. So, let $\exists v \phi(v, \vec{w})$ be a formula, with $\vec{w} = w_1, \dots, w_n$ the free variables. Let $\vec{c} = c_1, \dots, c_n$ constants; we write $L_{\vec{c}}$ for $L \cup \{c_1, \dots, c_n\}$.

Let Γ be the set of all quantifier-free L -formulas $\psi(\vec{w})$ such that

$$T \models (\exists v \phi(v, \vec{c})) \rightarrow \psi(\vec{c})$$