Contents

1 Sections

Sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum.

1.1 Section Title 1

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum.

1.1.1 Sub-Section Title 1

Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Sub-Sub-Section Title 1

At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

Sub-Sub-Section Title 2

At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

1.1.2 Sub-Section Title 2

At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

1.2 Section Title 2

Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

1.2.1 Sub-Section Title 2

Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.

1.3 New Page

Consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam

2 Images

Sources: [Wik18a].

2.1 Centered

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum.

Figure 2.1: A picture of a lion.

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum.

2.2 Right

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. At vero eos et accusam et justo duo dolores et ea rebum. At vero eos et accusam et justo duo dolores et ea rebum.

Figure 2.2: A lion

3 Tables

Sources: [Wik17b] and [Wik18c]

3.1 List

Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum.

- item 1
- item 2
- item 3
- item 4

3.2 Table

3.2.1 Left - Right - Center

title 1	**title 2**	**title 3**
item 001	attribute 1	12
item 002	attribute 2	1123
item 003	attribute 3	87
item 004	attribute 4	53

Table 3.1: A normal table

3.2.2 Left - Left - Long Text

title 1	**title 2**	**title 3**
item 1	attribute 1	Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat.
item 2	attribute 2	Diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat.
item 3	attribute 3	Lorem ipsum.
item 4	attribute 4	consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam.

Table 3.2: A table with long text

4 Listings

4.1 From File

4.1.1 Python

```
def main():
  print 'Hello, world!'

if __name__ == '__main__':
  main()
```

Listing 4.1: python code from file

4.1.2 C++

```
#include <iostream>

int main() {
    std::cout << "Hello, World!\n";
}
```

Listing 4.2: C++ code from file

4.2 Inline

```
def main():
  print 'Hello, world!'

if __name__ == '__main__':
  main()
```

Listing 4.3: python main

```
octave:1> function xdot = f (x, t)
>
>  r = 0.25; k = 1.4;
>  a = 1.5; b = 0.16; c = 0.9; d = 0.8;
>
>  xdot(1) = r*x(1)*(1 - x(1)/k) - a*x(1)*x(2)/(1 + b*x(1));
>  xdot(2) = c*a*x(1)*x(2)/(1 + b*x(1)) - d*x(2);
>
> endfunction
```

Listing 4.4: octave example

```
#!/bin/bash
echo "Hello, world!"
```

Listing 4.5: bash code

5 Equations

Sources: [Wik18b] and [Sha18]

5.1 Symbols and Letters

π
Π
$\forall x \in X, \quad \exists y \leq \epsilon$

5.2 Operators

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

$\lim_{x \to \infty} \exp(-x) = 0$

$k_{n+1} = n^{13} + k_n^2 - k_{n-1}$

$f(n) = n^5 + 4n^2 + 2|_{n=17}$

$\frac{n!}{k!(n-k)!} = \binom{n}{k}$

$\sqrt{\frac{a}{b}}$

$\sqrt[n]{1 + x + x^2 + x^3 + \cdots + x^n}$

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

$\sum_{i=1}^{10} t_i$

$$M = \begin{bmatrix} -1 & 3 \\ 2 & -4 \end{bmatrix}$$

$$f(n) = \begin{cases} n/2 & \text{if } n \text{ is even} \\ -(n+1)/2 & \text{if } n \text{ is odd} \end{cases}$$

5.3 Equations

$$x = a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{a_3 + \cfrac{1}{a_4}}}} \tag{5.1}$$

5.3.1 Aligned Equations

$$2x - 5y = 8 \tag{5.2}$$
$$3x + 9y + 15 = -12 \tag{5.3}$$

$$x = y \qquad w = z \qquad a = b + c \tag{5.4}$$
$$2x = -y \qquad 3w = \frac{1}{2}z \qquad a = b \tag{5.5}$$
$$-4 + 5x = 2 + y \qquad w + 2 = -1 + w \qquad ab = cb \tag{5.6}$$

$$\begin{aligned} A &= \frac{\pi r^2}{2} \\ &= \frac{1}{2}\pi r^2 \end{aligned} \tag{5.7}$$

6 Definitions

6.1 Definition

Definition 1 (NAME) *Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.*

6.2 Remark

Remark 1 (NAME) *Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.*

6.3 Example

Example 1 (NAME) *Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.*

6.4 Proof

Proof 1 (NAME) *Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet.*

7 Equations

Sources: [Wik18b] and [Sha18]

7.1 Symbols and Letters

π
Π
$\forall x \in X, \quad \exists y \leq \epsilon$

7.2 Operators

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

$\lim_{x \to \infty} \exp(-x) = 0$

$k_{n+1} = n^{13} + k_n^2 - k_{n-1}$

$f(n) = n^5 + 4n^2 + 2|_{n=17}$

$\frac{n!}{k!(n-k)!} = \binom{n}{k}$

$\sqrt{\frac{a}{b}}$

$\sqrt[n]{1 + x + x^2 + x^3 + \cdots + x^n}$

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

$\sum_{i=1}^{10} t_i$

$$M = \begin{bmatrix} -1 & 3 \\ 2 & -4 \end{bmatrix}$$

$$f(n) = \begin{cases} n/2 & \text{if } n \text{ is even} \\ -(n+1)/2 & \text{if } n \text{ is odd} \end{cases}$$

7.3 Equations

$$x = a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{a_3 + \cfrac{1}{a_4}}}} \tag{7.1}$$

7.3.1 Aligned Equations

$$2x - 5y = 8 \tag{7.2}$$
$$3x + 9y + 15 = -12 \tag{7.3}$$

$$x = y \qquad w = z \qquad a = b + c \tag{7.4}$$
$$2x = -y \qquad 3w = \frac{1}{2}z \qquad a = b \tag{7.5}$$
$$-4 + 5x = 2 + y \qquad w + 2 = -1 + w \qquad ab = cb \tag{7.6}$$

$$\begin{aligned} A &= \frac{\pi r^2}{2} \\ &= \frac{1}{2}\pi r^2 \end{aligned} \tag{7.7}$$

8 References

Sources: [Wik17a]

8.1 Labels

As seen in chapter 1, Figure 2.1, Listing 4.1, Table 3.1 or Equation 7.7
Also possible only with number for example in section 1

Bibliography

[Sha18] ShareLaTeX. Aligning equations with amsmath. 2018.
https://de.sharelatex.com/learn/Aligning_equations_with_amsmath
Accessed: 4.Jun.2018.

[Wik17a] Wikibooks. Latex/labels and cross-referencing. 2017.
https://en.wikibooks.org/wiki/LaTeX/Labels_and_Cross-referencing
Accessed: 4.Jun.2018.

[Wik17b] Wikibooks. Latex/list structures. 2017.
https://en.wikibooks.org/wiki/LaTeX/List_Structures
Accessed: 4.Jun.2018.

[Wik18a] Wikibooks. Latex/floats, figures and captions. 2018.
https://en.wikibooks.org/wiki/LaTeX/Floats,_Figures_and_Captions
Accessed: 4.Jun.2018.

[Wik18b] Wikibooks. Latex/mathematics. 2018.
https://en.wikibooks.org/wiki/LaTeX/Mathematics
Accessed: 4.Jun.2018.

[Wik18c] Wikibooks. Latex/tables. 2018.
https://en.wikibooks.org/wiki/LaTeX/Tables
Accessed: 4.Jun.2018.