1 Text mode and math mode

This is a line break.
This is not a line break.

This is centered text.

Use italics and bold text for emphasis.

Here is a nice formula with superscripts: \(x^n + y^n = z^n\). Longer formulas should be displayed:

\[
\sum_{i=1}^{100} i^2 = \frac{100 \cdot 101 \cdot 201}{6}.
\]

Formulas display differently in displayed and inline mode! The same thing in inline mode is: \(\sum_{i=1}^{100} i^2 = \frac{100 \cdot 101 \cdot 201}{6}\). Anything with a \(\sum\) or similar character should usually be displayed.

Text mode and math mode are entirely different! Commands and symbols that work in one may or may not work in the other. If you are in math mode and want to write text, use \(\backslash\text\):

\[x = 3\] and \(y = 5\)

Also keep in mind that quotation marks must be written specially: “like this”.

2 Special characters

As you have seen, backslash (\) is used to indicate a command in \LaTeX\. Backslash and other characters have a special meaning in \LaTeX\. These characters need to be escaped. To get the regular character, usually just add a backslash before it:

\[
\$ % & \{ \} _ \hat \backslash \sim
\]

Some characters are a little more complicated (you will probably not need some of these characters):

\[ ^ \ \ \ \ \ \ ^ \ \ \ \ \ \ \ \ ^ \ ~ \]

3 Lists

There are two sorts of lists. Bulleted lists:

- This
• is
• a
• bulleted
• list.

Enumerated lists:

1. This
2. is
3. an
4. enumerated
5. list.

4 More symbols and useful commands

Here are some useful math mode fonts:

\[ \mathbb{R} \quad \mathbb{N} \quad \mathcal{P} \]

Important commands:

\[ \frac{22}{7} + \sqrt{22 + \frac{7}{7}} + \left( \frac{22}{7} \right) \]

Use left and right parentheses correctly for big expressions:

\[ x = f \left( 1 + \frac{1}{1 + \frac{1}{1}} \right) \]

Set stuff:

\[ \emptyset \quad \cup \quad \cap \quad \{ x \in \mathbb{N} \mid x \leq 5 \} \]

Will be useful later:

\[ \neg \quad \lor \quad \land \quad 10 \equiv 3 \pmod{7} \quad \rightarrow \quad \Rightarrow \]
5 More advanced things

In addition to inline math and display math, there is aligned math:

\[
x = 3(5y + 10) \\
= 3 \cdot (5y) + 3 \cdot 10 \\
= 15y + 30
\]

You can include graphics with the ‘includegraphics’ package. We’ll go over this in the workshop.