

LaTeX

PHSG SEM 3 AND 5

PAPER : SEC A1

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MATH MODE

Greek Alphabets	Symbols	LaTeX command
Alpha	A	$\text{\$}\backslash\text{A}\text{\$}$
alpha	α	$\text{\$}\backslash\text{alpha}\text{\$}$
Beta	B	$\text{\$}\backslash\text{B}\text{\$}$
beta	B	$\text{\$}\backslash\text{beta}\text{\$}$
Gamma	Γ	$\text{\$}\backslash\text{Gamma}\text{\$}$
gamma	γ	$\text{\$}\backslash\text{gamma}\text{\$}$
Pi	Π	$\text{\$}\backslash\text{Pi}\text{\$}$
pi	π	$\text{\$}\backslash\text{pi}\text{\$}$
phi	ϕ	$\text{\$}\backslash\text{phi}\text{\$}$
Phi	Φ	$\text{\$}\backslash\text{Phi}\text{\$}$
mu	μ	$\text{\$}\backslash\text{mu}\text{\$}$
phi	φ	$\text{\$}\backslash\text{varphi}\text{\$}$

CREATING TABLES

- The tabular environment is the default latex method to create tables.

```
\documentclass{article}
\begin{document}
\begin{center}
\begin{tabular}{c c c}
cell1 & cell2 & cell3 \\
cell4 & cell5 & cell6 \\
cell7 & cell8 & cell9
\end{tabular}
\end{center}
\end{document}
```

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

CREATING TABLES

- The `centre` environment places the table at the centre of the page.
- Specify a parameter to this environment, in this case `{c c c}` which advises LATEX that there will be three columns and the text inside each one must be centred.
- Use ***r*** to right-align the text and ***l*** to left-align it.
- The alignment symbol `&` is used to separate individual table column cells within a table row.
- To end a table row use the new line command `\\`.

ADDING BORDERS TO TABLES

- To add horizontal rules, above and below rows, use the `\hline` command.
- To add vertical rules, between columns, use the vertical line parameter `|`
- `\begin{tabular}{|c|c|c|}`
`\hline`
`cell1 & cell2 & cell3 \\\`
`cell4 & cell5 & cell6 \\\`
`cell7 & cell8 & cell9 \\\`
`\hline`
`\end{tabular}`

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

ADDING BORDERS TO TABLES

- `\begin{tabular}{| | c | c | c | |}`
`\hline`
`cell1 & cell2 & cell3 \\\`
`cell4 & cell5 & cell6 \\\`
`cell7 & cell8 & cell9 \\\`
`\hline`
`\end{tabular}`

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

ADDING BORDERS TO TABLES

- `\begin{center}`
- `\begin{tabular}{|r|r|r|}`
- `\hline`
- `cell1 & cell2 & cell3 \\`
- `\hline`
- `cell4 & cell5 & cell6 \\`
- `\hline`
- `cell7 & cell8 & cell9 \\`
- `\hline`
- `\end{tabular}`
- `\end{center}`

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

ADDING BORDERS TO TABLES

- `\begin{center}`
- `\begin{tabular}{|r|r|r|}`
- `\hline \hline`
- `cell1 & cell2 & cell3 \\`
- `\hline`
- `cell4 & cell5 & cell6 \\`
- `\hline`
- `cell7 & cell8 & cell9 \\`
- `\hline \hline`
- `\end{tabular}`
- `\end{center}`

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

ADDING MATH IN LATEX

- Latex provides two writing modes for typesetting mathematics:
 - *Inline* math mode used for writing formulas that are part of a paragraph.
 - *Display* math mode used to write expressions that are not part of a paragraph and are typeset on separate lines.

INLINE MATH MODE

- To typeset inline-mode math you can use one of these pairs to enclose the mathematical formulae:

- $\text{\textbackslash}(... \text{\textbackslash})$, or
- $\text{\textbackslash}\$... \$$ or
- $\text{\textbackslash}\text{begin}\{\text{math}\} ... \text{\textbackslash}\text{end}\{\text{math}\}$
- Example:

$\text{\textbackslash}\text{documentclass}[12pt,a4paper]\{\text{article}\}$

$\text{\textbackslash}\text{begin}\{\text{document}\}$

In physics, the mass-energy equivalence is stated by the equation $E=mc^2$, discovered in 1905 by Albert Einstein.

$\text{\textbackslash}\text{end}\{\text{document}\}$

In physics, the mass-energy equivalence is stated by the equation $E = mc^2$, discovered in 1905 by Albert Einstein.

INLINE MATH MODE

- Example:
- `\documentclass{article}`
- `\begin{document}`
- `\begin{math}`
- $E=mc^2$
- `\end{math}` is typeset in a paragraph using inline math mode---as is $E=mc^2$, and so too is $(E=mc^2)$.
- `\end{document}`

$E = mc^2$ is typeset in a paragraph using inline math mode—as is $E = mc^2$, and so too is $E = mc^2$.

DISPLAY MATH MODE

- Equations typeset in display mode can be unnumbered:
- `\documentclass{article}`
- `\begin{document}`
- *The mass-energy equivalence is described by the famous equation $E=mc^2$ discovered in 1905 by Albert Einstein.*
- *In natural units ($c = 1$), the formula expresses the identity $E=m$*
- `\end{document}`

The mass-energy equivalence is described by the famous equation

$$E = mc^2$$

discovered in 1905 by Albert Einstein.

In natural units ($c = 1$), the formula expresses the identity

$$E = m$$

DISPLAY MATH MODE

```
\documentclass{article}
```

```
\begin{document}
```

The mass-energy equivalence is described by the famous equation

```
\begin{equation}
```

$$E=mc^2$$

```
\end{equation}
```

discovered in 1905 by albert einstein.

In natural units ($c = 1$), the formula expresses the identity

```
\begin{equation}
```

$$E=m$$

```
\end{equation}
```

```
\end{document}
```

The mass-energy equivalence is described by the famous equation

$$E = mc^2 \tag{1}$$

discovered in 1905 by Albert Einstein.

In natural units ($c = 1$), the formula expresses the identity

$$E = m \tag{2}$$

ACCENTS

✓ a' or $a^{\{\backslash\prime\}}$
 ✓ $\hat{a}$ $\backslash\hat{a}$
 ✓ $\grave{a}$ $\backslash\grave{a}$
 ✓ $\dot{a}$ $\backslash\dot{a}$
 ✓ $\not{a}$ $\backslash\not{a}$
 ✓ $\overrightarrow{AB}$ $\backslash\overrightarrow{AB}$
 ✓ a'''
 ✓ $\overline{aaa}$ $\backslash\overline{aaa}$
 ✓ $\breve{a}$ $\backslash\breve{a}$
 ✓ $\dddot{a}$ $\backslash\dddot{a}$ ⁶¹
 ✓ $\widehat{AAA}$ $\backslash\widehat{AAA}$
 ✓ $\widetilde{a}$ $\backslash\widetilde{a}$

a' ✓ a''
 $\hat{a}$ ✓ $\bar{a}$ $\backslash\bar{a}$
 $\grave{a}$ ✓ $\acute{a}$ $\backslash\acute{a}$
 $\dot{a}$ ✓ $\ddot{a}$ $\backslash\ddot{a}$
 $\mathring{a}$ ✓ $\mathring{a}$ $\backslash\mathring{a}$
 $\overrightarrow{AB}$ $\backslash\overrightarrow{AB}$
 a''' ✓ a''''
 $\overline{aaa}$ ✓ $\check{a}$ $\backslash\check{a}$
 $\breve{a}$ ✓ $\vec{a}$ $\backslash\vec{a}$
 $\dddot{a}$ ✓ $\ddddot{a}$ $\backslash\ddddot{a}$ ⁶²
 $\widehat{AAA}$ $\backslash\widehat{AAA}$
 $\widetilde{AAA}$ $\backslash\widetilde{AAA}$
 $\tilde{a}$ ✓ $\underline{a}$ $\backslash\underline{a}$

a''
 $\bar{a}$
 $\acute{a}$
 $\ddot{a}$
 $\overleftarrow{AB}$
 a''''
 $\check{a}$
 $\vec{a}$
 $\widetilde{AAA}$
 $\widehat{AAA}$
 $\underline{a}$