

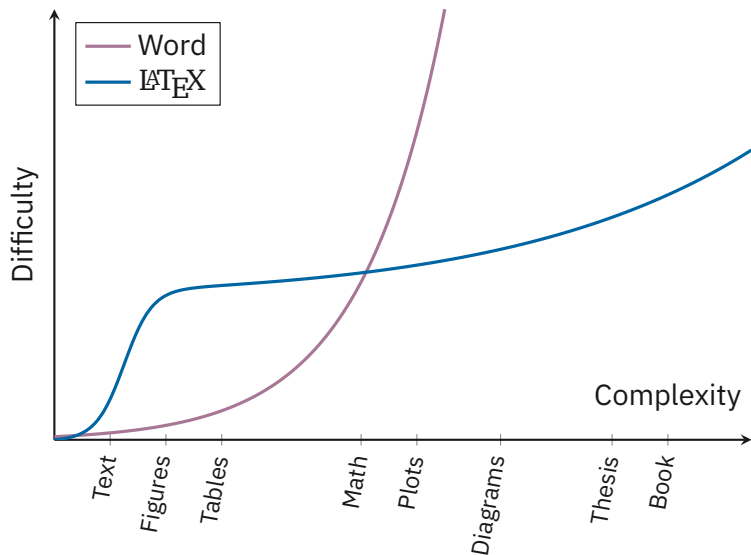
# L<sup>A</sup>T<sub>E</sub>X Workshop

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March 10, 2020

# Why $\text{\LaTeX}$



# Goal: Learn to typeset something like this

The last equality follows by observing that  $(\Omega \setminus B_R(\mathbf{r}_0)) \cap B_R(\mathbf{r}_0) = \emptyset$ , and the argument above. The RHS is the electric flux generated by a charged sphere, and so:

$$\Phi(R) = \frac{Q(R)}{\varepsilon_0} = \frac{1}{\varepsilon_0} \int_{B_R(\mathbf{r}_0)} \rho(\mathbf{r}') \, d\mathbf{r}' = \frac{1}{\varepsilon_0} \rho(\mathbf{r}'_c) |B_R(\mathbf{r}_0)| \quad \text{with } r'_c \in B_R(\mathbf{r}_0)$$

Where the last equality follows by the mean value theorem for integrals. Finally for the Squeeze theorem and the continuity of  $\rho$ :

$$\nabla \cdot \mathbf{E}_0(\mathbf{r}_0) = \lim_{R \rightarrow 0} \frac{\Phi(R)}{|B_R(\mathbf{r}_0)|} = \frac{\rho(\mathbf{r}_0)}{\varepsilon_0}$$

## 7.2 Deriving Coulomb's law from Gauss's law

Strictly speaking, Coulomb's law cannot be derived from Gauss's law alone, since Gauss's law does not give any information regarding the curl of  $\mathbf{E}$  (see Helmholtz decomposition and Faraday's law). However, Coulomb's law can be proven from Gauss's law if it is assumed, in addition, that the electric field from a point charge is spherically symmetric (this assumption, like Coulomb's law itself, is exactly true if the charge is stationary, and approximately true if the charge is in motion).

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- 5 Bibliography management
- 6 Extras

# What is Typesetting



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# Source code spacing



# Special characters

# Commands

# Environments

# Document structure

# Spacing and newlines

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# Emphasis, Bold, Italic, ...

```
1 This is \emph{emphatized}.
2 You may also use
3 \textbf{Bold},
4 \textit{Italic},
5 \textsf{Sans-Serif},
6 \textsc{SmallCaps},
7 \textrm{Roman},          % with serif
8 \texttt{Typewriter}.    % monospaced
```

This is *emphatized*. You may also use **Bold**, *Italic*, Sans-Serif, SmallCaps<sup>1</sup>, Roman or Typewriter.

---

<sup>1</sup>The font used in this presentation does not have smallcaps shapes

# Lists

```
1 \begin{itemize}
2   \item Tomatoes
3   \item Peppers
4   \item Broccoli
5 \end{itemize}
```

```
1 \begin{enumerate}
2   \item Discovery coffee
3   \item Get addicted
4   \item Congratulations
5 \end{enumerate}
```

## Itemize

- Tomatoes
- Peppers
- Broccoli

## Enumerate

- 1 Discovery coffee
- 2 Get addicted
- 3 Congratulations



# Description

```
1 \begin{description}
2   \item[Programmer] A person who is paid to
      professionally scream at a computer.
3   \item[Manager] A person who appears to know how
      all tasks should be accomplished but can't
      actually do any of those tasks themselves.
4 \end{description}
```

**Programmer** A person who is paid to professionally scream at a computer.

**Manager** A person who appears to know how all tasks should be accomplished but can't actually do any of those tasks themselves.

Table 1: Floats placing permissions

Specifier	Permission
h	Place around here
t	At the top of the page
b	At the bottom of the page
p	On a special page containing only floats
!	“I don’t care if it will be ugly”
H <sup>2</sup>	Place <b>exactly here</b> (may look very ugly)

---

<sup>2</sup>Requires the “float” package, i.e. “\usepackage{float}”

# Tables and tabular

```
1 \begin{table}[h]
2   \caption{Not up to date numbers}
3   \begin{tabular}{l r r}
4     \toprule1
5     Country & Infected & Deaths \\
6     \midrule1
7     China      & 80'652 & 3'070 \\
8     South Korea & 7'041  & 44 \\
9     Italy      & 5'833  & 233 \\
10    \bottomrule1
11  \end{tabular}
12 \end{table}
```

## <sup>1</sup> Pro Tip

Add “`\usepackage{booktabs}`” to use rulers.

Table 2: Not up to date numbers

Country	Infected	Deaths
China	80'652	3'070
South Korea	7'041	44
Italy <sup>3</sup>	5'833	233

---

<sup>3</sup> Congratulations, your public health worse than Iran's

# Figures

# Cross-References

```
1 \section{Introduction}  
2 ... will be discussed in \S \ref{sec:nvstokes} ...  
3  
4 \section{Stokes equation} \label{sec:nvstokes}
```

## Document

### **1 Introduction**

... will be discussed in §4 ...

### **4 Stokes Equation**

...

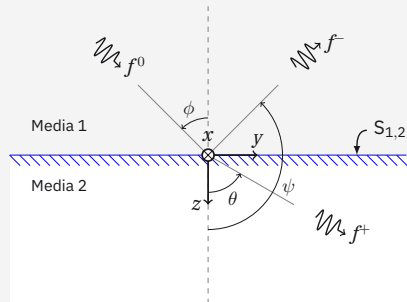
## Pro Tip

Use prefixes such as `sec:`, `fig:`, `tab:` to avoid mistakes.

# Cross-References

```
1 \begin{figure} % or table
2   \includegraphics{...}
3   \caption{Reflection and
4     refraction of
5     electromagnetic
6     waves.}
7   \label{fig:refl}
8 \end{figure}
... as shown in figure
\ref{fig:refl} ...
```

## Figure reference



**Figure 1:** Reflection and refraction of electromagnetic waves.

... as shown in figure 1 ...

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# Math environments

# Math symbols and fonts

# Equations

# Spacing in math mode

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# TheBibliography

# External bibliography

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# Source code listings

# Plots

