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# Lengths in LaTeX

In  $\text{\LaTeX}$  there are a lot of lengths determining various dimensions of prepared documents. For example, specified dimension parameters characterize fonts (/learn/Font\_sizes\_and\_kinds), pages (/learn/Page\_size\_and\_margins), or paragraphs (/learn/Paragraph\_formatting).

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## Units

Below a description of available units in  $\text{\LaTeX}$ .

Abbreviation	Value
<b>pt</b>	a point is approximately 1/72.27 inch, that means about 0.0138 inch or 0.3515 mm (exactly point is defined as 1/864 of American <i>printer's foot</i> that is 249/250 of English foot)
<b>mm</b>	a millimeter
<b>cm</b>	a centimeter
<b>in</b>	inch
<b>ex</b>	roughly the height of an 'x' (lowercase) in the current font (it depends on the font used)
<b>em</b>	roughly the width of an 'M' (uppercase) in the current font (it depends on the font used)
<b>mu</b>	math unit equal to 1/18 em, where em is taken from the math symbols family

Below an example that shows the difference between ex and em units.

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage{amssymb}
\usepackage{graphicx}

\begin{document}
Example of a picture with different lengths
\includegraphics[width=15ex]{lion-logo}

\includegraphics[width=15em]{lion-logo}
\end{document}
```

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Lengths

Lengths are units of distance relative to some document elements. Lengths can be changed by the command:

```
\setlength{\lengthname}{value_in_specified_unit}
```

For example, in a two-column document the column separation can be set to 1 inch by:

```
\setlength{\columnsep}{1in}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit.

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Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus

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Below is a table with some of the most common lengths and their description

Length	Description
\baselineskip	Vertical distance between lines in a paragraph
\columnsep	Distance between columns
\columnwidth	The width of a column
\evensidemargin	Margin of even pages, commonly used in two-sided documents such as books
\linewidth	Width of the line in the current environment.
\oddsidemargin	Margin of odd pages, commonly used in two-sided documents such as books
\paperwidth	Width of the page

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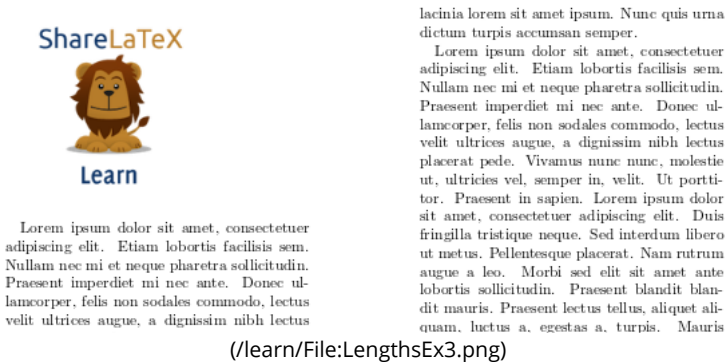
<code>\paperheight</code>	Height of the page
<code>\parindent</code>	Paragraph indentation
<code>\parskip</code>	Vertical space between paragraphs
<code>\tabcolsep</code>	Separation between columns in a table (tabular environment)
<code>\textheight</code>	Height of the text area in the page
<code>\textwidth</code>	Width of the text area in the page
<code>\topmargin</code>	Length of the top margin

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# Using lengths as units

Default lengths can not only be set to any desired value, they can also be used as units to set the dimensions of other L<sup>A</sup>T<sub>E</sub>X elements. For instance, you can set an image to have a width of one quarter the total text width.

```
\includegraphics[width=0.25\textwidth]{lion-logo}
[...]
```



In the command `\includegraphics` the width is set to 0.25 the width of the entire text area (see Inserting Images (/learn/Inserting\_Images) for more information about this command). You can use any length and multiply it by any factor.

➡ Open an example in ShareLaTeX (<https://www.sharelatex.com/project/new/template?zipUrl=/project/53402c44dd7cb62b32b6e62b/download/zip&templateName=Lenghts&compiler=pdflatex>)

# Further reading

For more information see the article about lengths on wikibooks (<http://en.wikibooks.org/wiki/LaTeX/Lengths>)

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