

# LaTeX Tutorial

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## 1 Introduction

### 1.1 Smaller title

I can type sentences and paragraphs just by typing. A new line doesn't do anything really but it helps you see your text easier and track changes better. I like to start a new line for each sentence.

A blank line, however, does start a new paragraph. You can force line breaks with double backslashes but I wouldn't advise this. Be careful with some special characters when typing such as ampersands, percentage, dollar, at symbol etc. To show these as text, use a `\` before: `%`, `$`, `&`, `$`. But these shouldn't come up regularly anyway. For single quotation marks, use `'` at the start and `'` at the end. For double quotes, use `"` and `"`. If you didn't, the left one would look `"` weird `"`.

I can change things like the spacing between paragraphs using `setlength`. `1em` sets the spacing to one uppercase character's height. `begingroup` and `endgroup` define a region where the changes are localized. If we didn't have these, the changes would be applied everywhere after this point.

For figures, I use `.pdf` where possible (vector graphics instead of rasterized). It's also ok to use `.eps` (gets converted to `.pdf`), `.png`, potentially others like `.jpeg`.

## 2 Typesetting maths

You can add maths inline using  $x = mx + b$ , or  $x = mx + b$ . You can put it on its own line using

$$A\Sigma + \Sigma^T A = B$$

But I typically use an equation *environment*

$$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi} \tag{1}$$

TEMPERATURE SCALES				
UNIT	WATER FREEZING POINT	WATER BOILING POINT	NOTES	CURSEDNESS
CELSIUS	0	100	USED IN MOST OF THE WORLD	2/10
KELVIN	273.15	373.15	0 K IS ABSOLUTE ZERO	2/10
FAHRENHEIT	32	212	OUTDOORS IN MOST PLACES IS BETWEEN 0-100	3/10
RÉAUMUR	0	80	LIKE CELSIUS, BUT WITH 80 INSTEAD OF 100	3/8
RÖMER	7.5	60	FAHRENHEIT PRECURSOR WITH SIMILARLY RANDOM DESIGN	4/10
RANKINE	491.7	671.7	FAHRENHEIT, BUT WITH 0° SET TO ABSOLUTE ZERO	6/10
NEWTON	0	33 <sup>1/3</sup>	POORLY DEFINED, WITH REFERENCE POINTS LIKE "THE HOTTEST WATER YOU CAN HOLD YOUR HAND IN"	7.5/10
WEDGEWOOD	-8	-67	INTENDED FOR COMPARING THE MELTING POINTS OF METALS, ALL OF WHICH IT WAS VERY WRONG ABOUT	9/10
GALEN	-4?	4??	RUNS FROM -4 (COLD) TO 4 (HOT). 0 IS "NORMAL" (?)	4/-4
REAL CELSIUS	100	0	IN ANDERS CELSIUS'S ORIGINAL SPECIFICATION, BIGGER NUMBERS ARE COLDER; OTHERS LATER FLIPPED IT	10/0
DALTON	0	100	A NONLINEAR SCALE: 0°C AND 100°C ARE 0 AND 100 DALTON, BUT 50°C IS 53.9 DALTON	53.9/50

Figure 1: Make sure you write a caption.

Or the same way but not with numbering

$$\int_{-\infty}^{\infty} e^{-ax^2} dx = \sqrt{\frac{\pi}{a}}$$

Importing other packages can bring other ways of typesetting maths, eg the `amsmath` package brings the `align` environment, which works the same way but also allows you to split equations across multiple lines

$$\sin(2\theta) = 2 \cos(\theta) \sin(\theta) \tag{2}$$

$$= 1 - 2 \cos^2(\theta). \tag{3}$$

The double backslash starts a new line and the ampersands are the anchor points for each line. For more information on breaking across multiple lines and different ways of numbering, look up and have a go with other environments. For example, using `subequations`, `align`:

$$\sin(2\theta) = 2 \cos(\theta) \sin(\theta) \tag{4a}$$

$$= 1 - 2 \cos^2(\theta). \tag{4b}$$

Using `equation`, `aligned`:

$$\begin{aligned} \sin(2\theta) &= 2 \cos(\theta) \sin(\theta) \\ &= 1 - 2 \cos^2(\theta). \end{aligned} \tag{5}$$