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/ A little more typesetting

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In Overleaf, start a new document and try these commands.

Functions

If you put letters into math mode in LaTeX, like `\(sin(x)\)`, LaTeX takes these as variable names $sin(x)$ - `s` times `i` times `n` times `(x)`. We write function names and other mathematical operators in non-italic text to avoid confusion - $\sin(x)$.

With many function names, LaTeX has a command which presents these in non-italic font. For example sin, cos and tan are `\sin`, `\cos` and `\tan`.

The brackets after these are optional - mathematically $\tan(x)$ and $\tan x$ are equally valid, though often using brackets is clearer. If you aren't using brackets, you must put a space at the end of the function name like `\tan x`.

If the content inside the brackets is too large, use `\left( ... \right)`. The `\left` and `\right` ask LaTeX to make the brackets large enough for whatever fits inside. For example, hopefully

$$\sin\left(\frac{x^2}{\pi}\right)$$

looks better than

$$\sin(\frac{x^2}{\pi})$$

This is achieved using

```
\[ \sin\left(\frac{x^2}{\pi}\right)\]
```

Sets

We can define a set using {...} like $\{a, b, c\}$. These braces are used for commands in LaTeX, for example a section heading is written using `\section{Title}`. We tell LaTeX we mean to include a `{` in the document and are not using one as part of a command using a `\`, like this:

```
Let \(A = \{a,b,c\}\) be a set containing three elements.
```

The $\in$ symbol is formed using `\in`. The `|` that means "such that" is just `|`, though I prefer to put `~|~` where the `~` just put a bit of extra space around the symbol. So we can define a set $A = \{x \in \mathbb{R} \mid x > 5\}$ like this.

```
\[ A = \{ x \in \mathbb{R} ~|~ x > 5 \} \]
```

For maps between sets, we use `\to`, so a map $\theta : \mathbb{N} \to \mathbb{R}$ can be defined like this

```
\theta: \mathbb{N} \to \mathbb{R}
```