CELEN087
Common Mathematical Expressions

Aidin Jalilzadeh

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Expressions

TEX	What you see
`x^n`	x^n
`e^{sin(x)-1}`	$e^{\sin(x)-1}$
`U^{ij}_{mn}`	U^{ij}_{mn}
`\frac{m}{m+n}`	$\frac{m}{m+n}$
`\sqrt{a-b}`	$\sqrt{a-b}$
`\sqrt[n]{p}`	$\sqrt[n]{p}$
`\int^{a}_{b}f(x)dx`	$\int_b^a f(x)dx$
`p \implies q`	$p \implies q$
`x \geq 3`	$x \geq 3$
`x \leq 3`	$x \leq 3$
`\lim_{x \to a} f(x)=L`	$\lim_{x \to a} f(x) = L$
`\sum_{i=0}^{i=k} i^2`	$\sum_{i=0}^{i=k} i^2$
`\mathbb{Q}=\{\frac{p}{q}| p q\in\mathbb{Z},q\neq 0\}`	$\mathbb{Q} = \{\frac{p}{q} \| p, q \in \mathbb{Z}, q \neq 0\}$
`x_n=x_{n-1} + x_{n-2}, \quad (n \geq 3)`	$x_n = x_{n-1} + x_{n-2}, \quad (n \geq 3)$

You can add horizontal space using `\quad, \qquad` or for a smaller space (less than `\quad`) you can simply type `\,` see next examples.

TEX	What you see
`p \& q`	$p\&q$
`p \, \& \, q`	$p \, \& \, q$
`p \,\, \& \,\, q`	$p \;\&\; q$

Notice that the `\lim` command for writing limitis has a different look when it is used in *display style*. See the example below:

TEX syntax: `\begin{equation} \lim_{x \to a} f(x)=L \end{equation}`

Output:

$$\lim_{x \to a} f(x) = L \tag{1}$$

The same applies to the `\sum` (Σ) command in *display style*. See below:

TEX syntax: `\begin{equation} \sum_{i=0}^{i=k} i^2 \end{equation}`

Output:

$$\sum_{i=0}^{i=k} i^2 \tag{2}$$

`cases` environment

To produce the following display of expressions:

$$|x| = \begin{cases} x & \text{if} \quad x \geq 0 \\ -x & \text{if} \quad x \leq 0 \end{cases}$$

use `cases` environment. Here is the TEXcode:

```
\begin{equation*}
|x|=
\begin{cases}
x & \textrm{if} \quad x \geq 0 \\
-x & \textrm{if} \quad x \leq 0 \\
\end{cases}
\end{equation*}
```

Symbols

NOTE: For mathematical symbols to work you must include \usepackage{amssymb}.

TEX	What you see
\pm	$\pm$
\infty	∞
\times	$\times$
\div	$\div$
\leq	$\leq$
\geq	$\geq$
\neq	$\neq$
\approx	$\approx$
\ast	$\ast$
\star	$\star$
\vee	$\vee$
\wedge	$\wedge$
\subset	$\subset$
\subseteq	$\subseteq$
\in	$\in$
\therefore	$\therefore$
\rightarrow	$\rightarrow$
\Rightarrow	$\Rightarrow$
\longrightarrow	$\longrightarrow$
\Longrightarrow	$\Longrightarrow$
\cos(x)	$\cos(x)$
\sin(x)	$\sin(x)$
\log_{10} x	$\log_{10} x$
\sum	$\sum$
\int	$\int$
\overline{abc}	$\overline{abc}$
\cdots	$\cdots$
\ldots	$\ldots$
\vdots	$\vdots$
\ddots	$\ddots$

Math Alphabets

TEX	What you see
\mathrm{ABCabc}	ABCabc
\mathbb{ABC}	$\mathbb{ABC}$
\mathcal{ABC}	$\mathcal{ABC}$
\mathfrak{ABCabc}	$\mathfrak{ABCabc}$

Greek Letters

TEX	What you see
\alpha	α
\beta	β
\gamma	γ
\lambda	λ
\pi	π
\delta	δ
\Delta	Δ
\Gamma	Γ
\phi	ϕ
\varphi	φ
\Phi	Φ
\omega	ω
\Omega	Ω