MyMacros package documentation

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Fonts in math mode

normal:	$abcdefghijklmnopqrstuvwxyz$
`\mathrm`:	$\mathrm{abcdefghijklmnopqrstuvwxyz}$
`\mathbf`:	$\mathbf{abcdefghijklmnopqrstuvwxyz}$
`\bm`:	$\bm{abcdefghijklmnopqrstuvwxyz}$
`\mathfrak`:	$\mathfrak{abcdefghijklmnopqrstuvwxyz}$
`\mathsf`:	$\mathsf{abcdefghijklmnopqrstuvwxyz}$

normal:	$ABCDEFGHIJKLMNOPQRSTUVWXYZ$
`\mathrm`:	$\mathrm{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\mathbf`:	$\mathbf{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\bm`:	$\bm{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\mathbb`:	$\mathbb{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\mathcal`:	$\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\mathfrak`:	$\mathfrak{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\mathscr`:	$\mathscr{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
`\mathsf`:	$\mathsf{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$

Letter modifiers

`\bar`:	$\bar a\ \bar b\ \bar c\ \bar d\ \bar e\ \bar f\ \bar g\ \bar h\ \bar i\ \bar j\ \bar k\ \bar l\ \bar m\ \bar n\ \bar o\ \bar p\ \bar q\ \bar r\ \bar s\ \bar t\ \bar u\ \bar v\ \bar w\ \bar x\ \bar y\ \bar z$
	$\bar A\ \bar B\ \bar C\ \bar D\ \bar E\ \bar F\ \bar G\ \bar H\ \bar I\ \bar J\ \bar K\ \bar L\ \bar M\ \bar N\ \bar O\ \bar P\ \bar Q\ \bar R\ \bar S\ \bar T\ \bar U\ \bar V\ \bar W\ \bar X\ \bar Y\ \bar Z$
`\overline`:	$\overline a\ \overline b\ \overline c\ \overline d\ \overline e\ \overline f\ \overline g\ \overline h\ \overline i\ \overline j\ \overline k\ \overline l\ \overline m\ \overline n\ \overline o\ \overline p\ \overline q\ \overline r\ \overline s\ \overline t\ \overline u\ \overline v\ \overline w\ \overline x\ \overline y\ \overline z$
	$\overline A\ \overline B\ \overline C\ \overline D\ \overline E\ \overline F\ \overline G\ \overline H\ \overline I\ \overline J\ \overline K\ \overline L\ \overline M\ \overline N\ \overline O\ \overline P\ \overline Q\ \overline R\ \overline S\ \overline T\ \overline U\ \overline V\ \overline W\ \overline X\ \overline Y\ \overline Z$
`\tilde`:	$\widetilde a\ \widetilde b\ \widetilde c\ \widetilde d\ \widetilde e\ \widetilde f\ \widetilde g\ \widetilde h\ \widetilde i\ \widetilde j\ \widetilde k\ \widetilde l\ \widetilde m\ \widetilde n\ \widetilde o\ \widetilde p\ \widetilde q\ \widetilde r\ \widetilde s\ \widetilde t\ \widetilde u\ \widetilde v\ \widetilde w\ \widetilde x\ \widetilde y\ \widetilde z$
	$\widetilde A\ \widetilde B\ \widetilde C\ \widetilde D\ \widetilde E\ \widetilde F\ \widetilde G\ \widetilde H\ \widetilde I\ \widetilde J\ \widetilde K\ \widetilde L\ \widetilde M\ \widetilde N\ \widetilde O\ \widetilde P\ \widetilde Q\ \widetilde R\ \widetilde S\ \widetilde T\ \widetilde U\ \widetilde V\ \widetilde W\ \widetilde X\ \widetilde Y\ \widetilde Z$
`\narrowtilde`:	$\tilde a\ \tilde b\ \tilde c\ \tilde d\ \tilde e\ \tilde f\ \tilde g\ \tilde h\ \tilde i\ \tilde j\ \tilde k\ \tilde l\ \tilde m\ \tilde n\ \tilde o\ \tilde p\ \tilde q\ \tilde r\ \tilde s\ \tilde t\ \tilde u\ \tilde v\ \tilde w\ \tilde x\ \tilde y\ \tilde z$
	$\tilde A\ \tilde B\ \tilde C\ \tilde D\ \tilde E\ \tilde F\ \tilde G\ \tilde H\ \tilde I\ \tilde J\ \tilde K\ \tilde L\ \tilde M\ \tilde N\ \tilde O\ \tilde P\ \tilde Q\ \tilde R\ \tilde S\ \tilde T\ \tilde U\ \tilde V\ \tilde W\ \tilde X\ \tilde Y\ \tilde Z$
`\hat`:	$\widehat a\ \widehat b\ \widehat c\ \widehat d\ \widehat e\ \widehat f\ \widehat g\ \widehat h\ \widehat i\ \widehat j\ \widehat k\ \widehat l\ \widehat m\ \widehat n\ \widehat o\ \widehat p\ \widehat q\ \widehat r\ \widehat s\ \widehat t\ \widehat u\ \widehat v\ \widehat w\ \widehat x\ \widehat y\ \widehat z$
	$\widehat A\ \widehat B\ \widehat C\ \widehat D\ \widehat E\ \widehat F\ \widehat G\ \widehat H\ \widehat I\ \widehat J\ \widehat K\ \widehat L\ \widehat M\ \widehat N\ \widehat O\ \widehat P\ \widehat Q\ \widehat R\ \widehat S\ \widehat T\ \widehat U\ \widehat V\ \widehat W\ \widehat X\ \widehat Y\ \widehat Z$
`\narrowhat`:	$\hat a\ \hat b\ \hat c\ \hat d\ \hat e\ \hat f\ \hat g\ \hat h\ \hat i\ \hat j\ \hat k\ \hat l\ \hat m\ \hat n\ \hat o\ \hat p\ \hat q\ \hat r\ \hat s\ \hat t\ \hat u\ \hat v\ \hat w\ \hat x\ \hat y\ \hat z$
	$\hat A\ \hat B\ \hat C\ \hat D\ \hat E\ \hat F\ \hat G\ \hat H\ \hat I\ \hat J\ \hat K\ \hat L\ \hat M\ \hat N\ \hat O\ \hat P\ \hat Q\ \hat R\ \hat S\ \hat T\ \hat U\ \hat V\ \hat W\ \hat X\ \hat Y\ \hat Z$
`\dot`:	$\dot a\ \dot b\ \dot c\ \dot d\ \dot e\ \dot f\ \dot g\ \dot h\ \dot i\ \dot j\ \dot k\ \dot l\ \dot m\ \dot n\ \dot o\ \dot p\ \dot q\ \dot r\ \dot s\ \dot t\ \dot u\ \dot v\ \dot w\ \dot x\ \dot y\ \dot z$
	$\dot A\ \dot B\ \dot C\ \dot D\ \dot E\ \dot F\ \dot G\ \dot H\ \dot I\ \dot J\ \dot K\ \dot L\ \dot M\ \dot N\ \dot O\ \dot P\ \dot Q\ \dot R\ \dot S\ \dot T\ \dot U\ \dot V\ \dot W\ \dot X\ \dot Y\ \dot Z$
`\ddot`:	$\ddot a\ \ddot b\ \ddot c\ \ddot d\ \ddot e\ \ddot f\ \ddot g\ \ddot h\ \ddot i\ \ddot j\ \ddot k\ \ddot l\ \ddot m\ \ddot n\ \ddot o\ \ddot p\ \ddot q\ \ddot r\ \ddot s\ \ddot t\ \ddot u\ \ddot v\ \ddot w\ \ddot x\ \ddot y\ \ddot z$
	$\ddot A\ \ddot B\ \ddot C\ \ddot D\ \ddot E\ \ddot F\ \ddot G\ \ddot H\ \ddot I\ \ddot J\ \ddot K\ \ddot L\ \ddot M\ \ddot N\ \ddot O\ \ddot P\ \ddot Q\ \ddot R\ \ddot S\ \ddot T\ \ddot U\ \ddot V\ \ddot W\ \ddot X\ \ddot Y\ \ddot Z$

Common notation

Differentials can be written with `\dd`.

$$a\,\mathrm{d}x + b\,\mathrm{d}y \qquad \int_0^\infty \frac{\sin x}{x}\,\mathrm{d}x \qquad \int_{\mathbb{R}^n} f(x)\,\mathrm{d}\mu(x)$$

Integrals can be typeset with `\int`, `\iint`, `\oint` and `\dint`.

$$\int_a^b \sin x\,\mathrm{d}x \qquad \iint_A f(x,y)\,\mathrm{d}\lambda(x,y) \qquad \oint_\gamma \ln z\,\mathrm{d}z \qquad \fint_Q f(x)\,\mathrm{d}x$$

The commands `\Re` and `\Im` have been redefined.

$$\mathrm{Re}(z) \qquad \mathrm{Im}(z)$$

For probability theory we have `\Pr`, `\E` and `\Var`.

$$\mathbb{P}[X \in A] \qquad \mathbb{E}[X^2] \qquad \mathrm{Var}[X]$$

For common arrows we have `\to`, `\into` and `\onto`. For setting symbols above and below other symbols use `\overset` and `\underset`.

$$f\colon A \to B \qquad A \hookrightarrow B \qquad A \overset{f}{\twoheadrightarrow} B$$

Multiline quantifiers can be written with `\substack`.

$$\sum_{\substack{i\in\mathbb{Z}\\ i \text{ odd}}} \frac{1}{i^2} = \frac{\pi^2}{4} \qquad p(x,y) = \sum_{\substack{i,j\in\mathbb{Z}\\ i,j\geqslant 0\\ i+j\leqslant 100}} x^i y^j$$

Use `\loc` to denote local spaces: $L^1_{\mathrm{loc}}(\mathbb{R}^n)$.

The following commands use the variant version, `\epsilon`, `\phi`, `\emptyset`, `\leq` and `\geq`.

$$\varepsilon \qquad \varphi \qquad \varnothing \qquad \leqslant \qquad \geqslant$$

The old symbols can still be accessed with `\le` and `\ge`: $\leq$ and $\geq$.

The following `\mathbb` variables can be accessed with `\N`, `\Z`, `\Q`, `\R`, `\C`, `\F`, `\K`, `\P`, `\V` and `\I`.

$$\mathbb{N} \qquad \mathbb{Z} \qquad \mathbb{Q} \qquad \mathbb{R} \qquad \mathbb{C} \qquad \mathbb{F} \qquad \mathbb{K} \qquad \mathbb{P} \qquad \mathbb{V} \qquad \mathbb{I}$$

Additionally, `\1` can be used to write $\mathbb{1}$. The old `\P` can still be accessed with `\pilcrow`: ¶.

The `\prep` can be used to write the `\perp` before the variable: ${}^\perp V$. The `\comp` and `\trans` can be used to write set complement and matrix transpose: A^c and A^T. The `\div` and `\ndiv` can be used to denote divisibility: $a \mid b$ and $a \nmid b$.

You can use the `dcases*` environment to write nice conditional expressions.

$$f(x) = \begin{cases} \dfrac{x}{2} & \text{if } x \text{ is even} \\ 3x+1 & \text{if } x \text{ is odd} \end{cases} .$$

Latin abbreviations

The Latin abbreviations can be written with `\ie`, `\eg`, `\cf`, `\etal` and `\etc`: *i.e.*, *e.g.*, *cf.*, *et al.* and *etc.*.

Enumerate

We can create an ordered list.

i. First item
ii. Second item
    (a) First subitem
iii. Third item

We can also include some text in the middle and resume with the list.

iv. Fourth item
v. Fifth item

Similarly, we can create an unordered list.

- An item
- Another item

Fixes

The spacing is correct when using a comma as a decimal separator, but also when using the comma as a separator normally when including a space.

$$\pi = 3{,}1415926535\dots \qquad (1, 2)$$

The spacing of delimiters is fixed, *i.e.*, it is safe to use `\left` and `\right`.

$$\sin\left(\frac{1}{2}\right) \qquad \alpha\left(\int_A f(x)\,\mathrm{d}x\right) \qquad \frac{1}{2}\left(\frac{x-1}{x^2-2}\right)$$

The `\setminus` and `\smallsetminus` now looks like this: $A \setminus B$ and $A \smallsetminus B$.

Theorem environments

Theorem 1.1. *Let R be a ring. If $A, B \in R$ are such that $AB = BA$, then*

$$(A+B)(A-B) = A^2 - B^2.$$

Lemma 1.2 (Euclid [1, page 3])**.** *Here is a named lemma.*

Proof. This is the proof of the above lemma.

$\boxed{\Rightarrow}$ Denote this direction with `\ProofRightarrow`.

$\boxed{\Leftarrow}$ Denote this direction with `\ProofLeftarrow`. □

Proof of Theorem 1.1. This is the proof for the above theorem.

$$
\begin{aligned}
(A+B)(A-B) &= AA - AB + BA - BB \\
\text{(By commutativity of } A \text{ and } B\text{)} & \\
&= AA - AB + AB - BB \\
\text{(By canceling the terms)} & \\
&= A^2 - B^2
\end{aligned}
$$

□

References

[1] Euclid, "Some paper," *Annals of Mathematics*, 400BCE.