

Fonts in math mode

normal:	<i>abcdefghijklmnopqrstuvwxyz</i>
$\mathrm{}$:	abcdefghijklmnopqrstuvwxyz
$\mathbf{}$:	abcdefghijklmnopqrstuvwxyz
$\bm{}$:	<i>abcdefghijklmnopqrstuvwxyz</i>
$\mathfrak{}$:	abcdefghijklmnopqrstuvwxyz
$\mathsf{}$:	abcdefghijklmnopqrstuvwxyz
normal:	ABCDEFGHIJKLMNOPQRSTUVWXYZ
$\mathrm{}$:	ABCDEFGHIJKLMNOPQRSTUVWXYZ
$\mathbf{}$:	ABCDEFGHIJKLMNOPQRSTUVWXYZ
$\bm{}$:	<i>ABCDEFGHIJKLMNOPQRSTUVWXYZ</i>
$\mathbb{}$:	ABCDEFGHIJKLMNOPQRSTUVWXYZ
$\mathcal{}$:	<i>ABCDEFGHIJKLMNOPQRSTUVWXYZ</i>
$\mathfrak{}$:	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
$\mathscr{}$:	<i>A B C D E F G H I J K L M N O P Q R S T U V W X Y Z</i>
$\mathsf{}$:	ABCDEFGHIJKLMNOPQRSTUVWXYZ

Letter modifiers

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

Common notation

Differentials can be written with `\dd`.

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

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

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

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

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

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

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

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

$$f: A \rightarrow B \qquad A \hookrightarrow B \qquad A \overset{f}{\twoheadrightarrow} B$$

Multiline quantifiers can be written with `\substack`.

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

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

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

$$\varepsilon \qquad \varphi \qquad \varnothing \qquad \leq \qquad \geq$$

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

The following `\mathbb{b}` 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^\top . 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.

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

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`.

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

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

In addition to `\texteuro` (€) or the € symbol, you can use `\euro` (€).

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.

\Rightarrow Denote this direction with `\ProofRightarrow`.

\Leftarrow Denote this direction with `\ProofLeftarrow`. □

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

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

(By canceling the terms)

$$= A^2 - B^2$$

□

References

- [1] Euclid, “Some paper,” *Annals of Mathematics*, 400BCE.