\LaTeX{} Mathematical Symbols

The more unusual symbols are not defined in base \LaTeX{} (NFSS) and require `\usepackage{amssymb}.

1 Greek and Hebrew letters

\begin{align*}
\alpha & \quad \kappa & \quad \psi & \quad \digamma & \quad \Delta & \quad \Theta \\
\beta & \quad \lambda & \quad \rho & \quad \varepsilon & \quad \Gamma & \quad \Upsilon \\
\chi & \quad \mu & \quad \sigma & \quad \kappaappa & \quad \Lambda & \quad \Xi \\
\delta & \quad \nu & \quad \tau & \quad \varpi & \quad \Omega \\
\epsilon & \quad \omicron & \quad \theta & \quad \varpi & \quad \Phi & \quad \aleph \\
\gamma & \quad \phi & \quad \chi & \quad \varsigma & \quad \Psi & \quad \beth \\
\iota & \quad \pi & \quad \zeta & \quad \vartheta & \quad \Sigma & \quad \gimel \\
\end{align*}

2 \LaTeX{} math constructs

\begin{align*}
\frac{abc}{xyz} & \quad \overline{abc} & \quad \overrightarrow{abc} \\
\frac{d}{dx} & \quad \underline{abc} & \quad \overleftarrow{abc} \\
\sqrt{abc} & \quad \widehat{abc} & \quad \underbrace{abc} \\
\sqrt[n]{abc} & \quad \widetilde{abc} & \quad \overbrace{abc}
\end{align*}

3 Delimiters

Use the pair `\left` and `\right` to match height of delimiters $s_1$ and $s_2$ to the height of their contents, e.g., `\left( expr \right)`.

4 Variable-sized symbols (displayed formulae show larger version)

\begin{align*}
\sum & \quad \prod & \quad \coprod \\
\bigcup & \quad \bigcap & \quad \biguplus & \quad \bigoplus & \quad \bigvee & \quad \bigwedge \\
\bigcup & \quad \bigcap & \quad \bigcup & \quad \bigcap
\end{align*}

5 Standard Function Names

Function names should appear in Roman, not Italic, e.g., `\arccos expr` is correct, `\arccos at expr` is incorrect.

\begin{align*}
\arccos & \quad \arcsin & \quad \arctan & \quad \arg & \quad \tan
\cos & \quad \cosh & \quad \cot & \quad \coth & \quad \csc
\csc & \quad \deg & \quad \det & \quad \dim & \quad \exp
\exp & \quad \gcd & \quad \hom & \quad \inf & \quad \ker
\limsup & \quad \ln & \quad \log & \quad \max & \quad \min
\sin & \quad \sup & \quad \tan & \quad \tanh
\end{align*}
### 6 Binary Operation/Relation Symbols

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7 Arrow symbols

\leftarrow \ Longleftarrow \ \mapsto \ \twoheadrightarrow \ \nearrow
\Leftarrow \ Longleftarrow \ \mapsto \ \twoheadrightarrow \ \nearrow
\rightarrow \ Longrightarrow \ \mapsto \ \twoheadrightarrow \ \nearrow
\Rightarrow \ \twoheadrightarrow \ \nearrow
\leftrightarrow \ Rightleftharpoons \ \leadsto
\longleftrightarrow \ \rightleftarrows \ \looparrowleft \ \Rsh
\uparrow \ \Uparrow \ \upharpoonright \ \upharpoonright
\downarrow \ \Downarrow \ \downharpoonright \ \downharpoonright
\mapsto \ \rightsquigarrow \ \rightsquigarrow
\hfill
\rightleftharpoons \ \rightleftharpoons \ \rightleftharpoons
\mapsto \ \rightsquigarrow \ \rightsquigarrow
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8 Miscellaneous symbols

\infty \ \forall \ \forall \ \forall \ \forall \ \forall \ \forall
\exists \ \exists \ \exists \ \exists \ \exists \ \exists \ \exists
\emptyset \ \emptyset \ \emptyset \ \emptyset \ \emptyset \ \emptyset
\nexists \ \nexists \ \nexists \ \nexists \ \nexists \ \nexists
\Diamond \ \Diamond \ \Diamond \ \Diamond \ \Diamond \ \Diamond
\complement \ \complement \ \complement \ \complement \ \complement \ \complement
\flat \ \flat \ \flat \ \flat \ \flat \ \flat
\natural \ \natural \ \natural \ \natural \ \natural \ \natural
\uparrow \ \uparrow \ \uparrow \ \uparrow \ \uparrow \ \uparrow
\downarrow \ \downarrow \ \downarrow \ \downarrow \ \downarrow \ \downarrow
\updownarrow \ \updownarrow \ \updownarrow \ \updownarrow \ \updownarrow \ \updownarrow
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9 Math mode accents

\acute \ \acute \ \acute \ \acute \ \acute \ \acute
\breve \ \breve \ \breve \ \breve \ \breve \ \breve
\check \ \check \ \check \ \check \ \check \ \check
\grave \ \grave \ \grave \ \grave \ \grave \ \grave
\tilde \ \tilde \ \tilde \ \tilde \ \tilde \ \tilde
\dddot \ \dddot \ \dddot \ \dddot \ \dddot \ \dddot
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10 Array environment, examples

Simplest version:
\begin{array}{cols} row_1 \ \row_2 \ \ldots \ \row_m \ \end{array}

where \textit{cols} includes one character \textit{lrc} for each column (with optional characters | inserted for vertical lines) and \textit{row_j} includes character & a total of \((n - 1)\) times to separate the \(n\) elements in the row. Examples:

\begin{align*}
\left( \begin{array}{cc}
2\tau & 7\phi - \frac{5\pi}{12} \\
3\psi & \frac{\pi}{8}
\end{array} \right) & \quad \text{and} \quad \left[ \begin{array}{ccc}
3 & 4 & 5 \\
1 & 3 & 729
\end{array} \right]
\end{align*}

\begin{align*}
f(z) &= \left\{ \begin{array}{ll}
z^2 + \cos z & \text{for } |z| < 3 \\
0 & \text{for } 3 \leq |z| \leq 5 \\
\sin z & \text{for } |z| > 5
\end{array} \right.
\end{align*}

11 Other Styles (math mode only)

Caligraphic letters: \$\textit{\textbf{\texttt{\textcal{A}}}}\$ etc.: \textit{ABCDEFGHIJKLMNOPQRSTUVWXYZ}
Mathbb letters: \$\textit{\textbf{\texttt{\textbb{A}}}}\$ etc.: \textit{ABCDEFGHIJKLMNOPQRSTUVWXYZ}
Mathfrak letters: \$\textit{\textbf{\texttt{\textfrak{A}}}}\$ etc.: \textit{ABCDEFGHIJKLMNOPQRSTUVWXYZ}
Math Sans serif letters: \$\textit{\textbf{\texttt{\textsf{A}}}}\$ etc.: \textit{ABCDEFGHIJKLMNOPQRSTUVWXYZ}
Math bold letters: \$\textit{\textbf{\texttt{\textbf{A}}}}\$ etc.: \textit{ABCDEFGHIJKLMNOPQRSTUVWXYZ}
Math bold italic letters: \textit{\textbf{\texttt{\textbi{A}}}} then use \$\textit{\textbf{\texttt{\textbi{A}}}}\$ etc.: \textit{ABCDEFGHIJKLMNOPQRSTUVWXYZ}

\begin{align*}
\int f^{-1}(x - x_a) \, dx
\end{align*}

\text{Math Mode:}

\tiny = smallest \quad \text{normalsize = normal} \quad \text{huge = huge} \quad \text{\huge = Huge}

\text{Text Mode:}

\scriptsize = very small \quad \text{\Large = Large} \quad \text{\Huge = Huge}

\footnotesize = smaller \quad \text{\LARGE = LARGE}

\small = small

13 Text Mode: Accents and Symbols

\begin{align*}
\acute{o} & \ddot{o} & \grave{o} & \check{o} & \breve{o} & \tilde{o} & \bar{o} & \dot{o} & \ddot{o} \\
\grave{\acute{\hat{o}}} & \ddot{\breve{\check{o}}} & \tilde{\bar{\dot{o}}} & \ddot{\tilde{\bar{\dot{o}}}} & \dddot{\bar{\dot{o}}}
\end{align*}