Two features of \texttt{mathastext} : extended scope of the math alphabets and added italic corrections

The package makes !, ;, +, =, (, [ ] < >, the asterisk *, and /\# $ % & obey the math alphabet commands (this is the maximal list, some characters may have been excluded by the corresponding package options). For the characters listed first the mechanism involves a ‘mathematical activation’.

As this process may create incompatibilities, it will be put into action for !, ;, +, =, (, ) [ ] < > only if the user makes use of the package command \MTnonlettersobeymathxx (and the braces ne-
cessitate \MTexplicitbracesobeymathxx).

It could be that one such character has been made ‘active’ in the entire document by some other package, typically a language definition file for the \texttt{babel} system. Here for example we have used \texttt{babel} with the \texttt{french} option, which makes the high punctuation characters !, ;, +, = active throughout the document (extra spacing is put in front of the character when used in text; no change in math but perhaps for other languages and characters this could happen, it is up to the language definition file to decide).

When \texttt{mathastext} detects that a character it wants to ‘mathematically activate’ is already ‘ac-
tive’, it does not go further except if it seems that the activation was done by Babel. If the activation was done by Babel, then \texttt{mathastext} replaces the expansion of the active character in math mode by what is necessary to achieve its goal. It does not additionally mathematically activate the character; rather it makes sure that the character is not mathematically active. In the present document the colon was made mathematically active by \texttt{mathtools} but this was already canceled in the preamble by \texttt{mathastext} as it was loaded later. And it is better so, because the combination \texttt{babel} (with option \texttt{frenchb})+\texttt{mathtools} (with \texttt{centercolon}) makes $$:$$ create an infinite loop!

But even if someone had mathematically activated the colon after the preamble, or after the loading of \texttt{mathastext}, this would be canceled again automatically for each inline or displayed mathematical formula (if the user does \MTnonlettersobeymathxx).

The conclusion with \MTnonlettersobeymathxx is: if some package has tried to make the character mathematically active, this will be overruled by \texttt{mathastext}; if some package has made the character globally active, then the package wins except if it is Babel, as \texttt{mathastext} may in the latter case safely modify the action in math mode (paying attention to the fact that the character should be usable in \texttt{\label} and \texttt{\ref} in and outside of math mode).

The displayed equations next illustrate the extended scope of the math alphabets which now apply to =, –, (, ), [, ] (but not to the large delimiters of course). Furthermore, for testing purposes the equations were labeled using such characters, for example the last one has label \texttt{eq=7}, to check that the mathematical activation of = does not cause problems with \texttt{\label}/\texttt{\ref}.

\begin{align*}
\left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} & \quad (1) \\
\text{mathnormalbold} & \quad \left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} \quad (2) \\
\text{mathrm} & \quad \left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} \quad (3)
\end{align*}
\begin{align*}
\textbf{mathbf :} & \quad \left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} \\
\textit{mathit :} & \quad \left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} \\
\texttt{mathtt :} & \quad \left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} \\
\textsf{mathsf :} & \quad \left\{ \left( \left[ \sin(a) + \cos(b) - \log(c) = \sec(d) \right] \right) \right\} \\
\text{Equations above are numbered 1, 2, 3, 4, and 5, 6, and 7.}
\end{align*}

The question mark has been made active by \texttt{babel+frenchb}. \texttt{mathastext} has imposed in math mode its ways (now $\mathbf{???}$ gives ????). As the extra spacing is added by \texttt{frenchb} only in text, we had to use the math alphabet to check that indeed \texttt{mathastext} overruled Babel.

To double-check we will now make ? mathematically active : \texttt{\mathcode'="8000}. This is a sure cause for disaster normally with Babel (don’t do this at home without \texttt{mathastext}!). But here with \$??\$ no bad surprise (infinite loop !) awaits us : just ?.

Let’s take some other character, for example the opening parenthesis, and make it catcode active : \texttt{\catcode '('=\active \def \{X}. Let’s try the input ( and \$\$(. This gives X and X. We
see that \texttt{mathastext} does not attempt to modify the definition of the active character, as this activation was not done via the \texttt{babel} services. We now revert the parenthesis to catcode other (but maintain \texttt{\def \mathcode ' ( =8000}. If we try $((($ we see that the parenthesis is not converted into an $X:(($. The mathematically active character was overruled by \texttt{mathastext}.

Issuing \texttt{\MTnonlettersdonotobeymathxx} we do get the $X$'s from the input $(((X XXX$

This shows that \texttt{mathastext} now does not modify in math mode the non-letter $\)$. We defined in the preamble of the document a \texttt{mathastext}-enhanced math version (named \texttt{upright}) having the Latin letters upright in math mode. Let's switch to it:

\begin{verbatim}
\MTversion{upright}
\end{verbatim}

With a font which is neither italic nor slanted, \texttt{mathastext} automatically inserts italic corrections for better positioning of the subscript: $f^i_i$ gives $f^i_i$. After \texttt{\MTnoicinmath} which turns off this feature, the same input gives $f^i_i$, which is different.¹

Again with italic corrections on (\texttt{\MTicinmath}) $f_{abc}^{def}$ gives $f_{abc}^{def}$, and here is another one: $f_{abc}^{def}$. Without italic corrections: $f_{abc}^{def}$, and respectively $f_{abc}^{def}$.²

\texttt{mathastext} does not add these italic corrections inside arguments of math alphabets, as this would prevent the formation of ligatures: \texttt{ff}, \texttt{ff}, \texttt{ff}, \texttt{ff} (no ligature in teletype) and \texttt{ff}.

¹ last time I tried, this only worked with PDFL\TeX, not with LuaL\TeX or \LaTeX.

² Prior to 1.3i, italic corrections were added to the \texttt{\mathnormal} arguments.

Changed!