The `maybemath` package for LaTeX

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The `maybemath` package provides a set of commands for adjusting math-mode typesetting to match the context of the surrounding paragraph. This includes making the math-mode text bold, upright, forced italic or sans-serif according to context, or any combination of these. It can be particularly useful when math terms must appear in section headings, as this implies the same expression appearing in several boldness contexts: the heading itself, the table of contents and perhaps a page header or footer. Typically this has been resolved manually by use of the optional second argument of the sectioning commands: `maybemath` provides a more seamless solution.

This package was developed in order to implement the `hepparticles` package, used for typesetting high-energy physics particle names.

The commands available are defined below. In general they may be nested and can take arbitrarily large arguments within a single math expression. The term to watch in the expressions below is the x^3:

1 Bold contexts

- For context-sensitive boldness use `\maybebm{`*expr*`}`:
  `\dots foo bar, $x^2 + \maybebm{x^3} + \dotsb$`
  ⇒ ... foo bar, $x^2 + x^3 + \cdots$
  `\textbf{\dots foo bar, $x^2 + \maybebm{x^3} + \dotsb$}`
  ⇒ **... foo bar,** $x^2 + \boldsymbol{x^3} + \cdots$

2 Upright and italic contexts

- For context-sensitive upright math typesetting use \mayberm{*expr*}:
  `\dots foo bar, $x^2 + \mayberm{x^3} + \dotsb$`
  ⇒ ... foo bar, $x^2 + \mathrm{x}^3 + \cdots$
  `\textit{\dots foo bar, $x^2 + \mayberm{x^3} + \dotsb$}`
  ⇒ *... foo bar,* $x^2 + x^3 + \cdots$

- Alternatively, to force \mathit in italic contexts use \maybeit{*expr*}:
  `\dots foo bar, $x^2 + \maybeit{x^3} + \dotsb$`
  ⇒ ... foo bar, $x^2 + x^3 + \cdots$
  `\textit{\dots foo bar, $x^2 + \maybeit{x^3} + \dotsb$}`
  ⇒ *... foo bar,* $x^2 + x^3 + \cdots$

- The functionality of both \mayberm and \maybeit is combined for convenience in the command \maybeitrm{*expr*}:
  `\dots foo bar, $x^2 + \maybeitrm{x^3} + \dotsb$`
  ⇒ ... foo bar, $x^2 + \mathrm{x}^3 + \cdots$
  `\textit{\dots foo bar, $x^2 + \maybeitrm{x^3} + \dotsb$}`
  ⇒ *... foo bar,* $x^2 + x^3 + \cdots$

- An extra command is available for adjusting the spacing of subscripts in italic contexts: they are shifted to the left if wrapped with the command \maybeitsubscript{*expr*}:
  `\dots foo bar, $\mayberm{B_d^0} \to \`
  `\mayberm{B_\maybeitsubscript{d}^0}$`
  ⇒ ... foo bar, $\mathrm{B}_{\mathrm{d}}^{0} \to \mathrm{B}_{\mathrm{d}}^{0}$
  `\textit{\dots foo bar, $\mayberm{B_d^0} \to \`
  `\mayberm{B_\maybeitsubscript{d}^0}$}`
  ⇒ *... foo bar,* $B_d^0 \to B_d^0$
  I'm not aware if there are particular uses for this outside the pickinesses of particle-name typesetting but it *may* be useful!

3 Sans-serif contexts

- For context-sensitive sans-serif math typesetting use \maybesf{*expr*}:
  `\dots foo bar, $x^2 + \maybesf{x^3} + \dotsb$`
  ⇒ ... foo bar, $x^2 + x^3 + \cdots$

`\textsf{\dots foo bar, $x^2 + \maybesf{x^3} + \dotsb$}`
⇒ $\ldots$ foo bar, $x^2 + \mathsf{x}^3 + \cdots$
Note that there is no italic version of the sans-serif math font, so use of `\maybesf` eliminates italic context handling.

4 Combined contexts

- For combined bold-and-sans-serif context handling, a `\maybebmsf`{*expr*} command is provided:
`\dots foo bar, $x^2 + \maybebmsf{x^3} + \dotsb$`
⇒ $\ldots$ foo bar, $x^2 + x^3 + \cdots$
`\textbf{\dots foo bar, $x^2 + \maybebmsf{x^3} + \dotsb$}`
⇒ $\boldsymbol{\ldots \text{foo bar,}\ x^2 + x^3 + \cdots}$
`\textsf{\dots foo bar, $x^2 + \maybebmsf{x^3} + \dotsb$}`
⇒ $\ldots$ foo bar, $x^2 + \mathsf{x}^3 + \cdots$
`\textbf{\textsf{\dots foo bar, $x^2 + \maybebmsf{x^3} + \dotsb$}}`
⇒ $\boldsymbol{\ldots \text{foo bar,}\ x^2 + \mathsf{x}^3 + \cdots}$
This is assumed to be the most commonly required combination of context-sensitive math typesetting: most other combinations can be achieved by nesting the primitive `maybemath` commands.

Any feedback is appreciated! Email to `andy@insectnation.org`, please.