1 looking at font styles in equations

For example, in
\[ n(t + 1) = An(t)Q \]
both the Q and the bold font \( n \) should not be italicized in the .rtf output. LaTeX never italicizes bold font in math mode (as this is never needed/wanted).

2 testing align environment

First align without an asterisk.
\[
zw = (3 + 2i)(2 - i) \\
= 6 - 3i + 4i - 2i^2 \\
= 8 + i
\]

Now align with an asterisk.
\[
zw = (3 + 2i)(2 - i) \\
= 6 - 3i + 4i - 2i^2 \\
= 8 + i
\]

3 testing equation references

\[ x = y \] (1)
The equation before this is equation 1. Alternatively one might use (1).

4 reported (non-) problems in 1.9.15

First commas in equations
for \( x, y \) in \( A \)
as an inline \( \forall x, y \in Z \). Yet another comma example \( R_1, R_2 \)
Now for the problem associated with \( \sum \)
\[ \sum = 1 \]
1
5 Inline equations

First, test an inline equation in a paragraph of its own
\[ x^2 + y^2 = z^2 \]

Let's test baselines of equations. First compare these ........ as well as .......
Now descenders like \( y \) and finally \( x^2 \) vs \( x_2 \) or \( x \_2 \) vs \( x_2 \)
Parsing the tricky $$ properly \( \varepsilon \) as an example.

First begin with simple $ delimited equation such as \( x+y = w \) as an example.

All the equations in this section should look identical.

Next how about a simple \begin{math} delimited equation such as \( x+y = w \)
as an example. All the equations in this section should look identical.

Now consider \( \text{ and } \) delimited equation such as \( x+y = w \) as an example.
All the equations in this section should look identical.

6 Unnumbered equations

I will start with a simple $$ wave equation that will have no number
\[ \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \]

Bug that caused crash when equation began with \ldots
\[ \ldots \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \]

another reported crash with ldots
\[ \ldots \; = \; b \]
\[ c \; = \; d \]

Note: Delimiting an equation by $$ is a plain\TeX{} command which causes inconsistent vertical distances and does not obey the class option fleqn. Therefore it should not be used in \LaTeX{} documents. Use \[...\] instead:
\[ \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \]

This is followed by a displaymath environment
\[ \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \]

Here is an example of the \[ environment
\[ \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \]

Here we check indentation
\[ a = b \]
displaymath
\[ a = b \]
enddisplaymath
7 Numbered equations

Next comes an equation environment

\[ \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \quad (2) \]

Note that \texttt{\textbackslash nonumber} in an equation environment still gets an equation number

\[ \nabla^2 \phi - \frac{1}{c} \frac{\partial \phi}{\partial t} = 0 \]

8 Testing equation array

Here the equation array is being tested. This equation has no equation number and is about as simple as an equation array can get.

\[ \begin{array}{c}
  z = w + x + \\
  5w - 8c
\end{array} \]

Here the equation array is being tested. This equation has equation numbers and is almost as simple as an equation array can get.

\[ \begin{array}{c}
  z = w + x + \\
  5w - 8c
\end{array} \quad (3) \quad (4) \]

Here the equation array is being tested. This equation the first and third equations numbered

\[ \begin{array}{c}
  z = w + x \\
  z = w + x \\
  z = w + x
\end{array} \quad (5) \quad (6) \]

Here the equation array is being tested. This checks for a bug when \texttt{\textbackslash nonumber} is present in an \texttt{\begin{eqnarray*}} environment. No equations should be numbered.

\[ \begin{array}{c}
  z = w + x \\
  z = w + x \\
  z = w + x
\end{array} \]

9 Equation numbering test

This equation needs a number

\[ \varphi = \begin{bmatrix} \psi_1 \\ \psi_2 \end{bmatrix} ; \quad \chi = \begin{bmatrix} \psi_3 \\ \psi_4 \end{bmatrix} ; \quad \eta = \begin{bmatrix} \tilde{\psi}_1 \\ \tilde{\psi}_2 \end{bmatrix} ; \quad \text{and} \quad \lambda = \begin{bmatrix} \tilde{\psi}_3 \\ \tilde{\psi}_4 \end{bmatrix} ; \quad (7) \]

more text following
10 Testing math environment closing

For a while, getting \texttt{latex2rtf} to contain all the math elements to the enclosing was a major headache. It is working for now. Here are a few test cases.

Case 1 Here a math environment is found within an italic environment $s_c + 1$ or $s_c$.

Case 2 The odd construction $\textbf{a} + \textbf{R}$ follows $a + R$ which should make “a” italic and “R” bold.

Case 3 Same as above but using \begin{math} to enter a math environment $a + R$

Case 4 Same as above but using \begin{equation} to enter a math environment

Case 5 Same as above but using \begin{equation*} to enter a math environment

Case 6 Same as above but using \begin{eqnarray} to enter a math environment

Case 7 Same as above but using \begin{eqnarray*} to enter a math environment

Case 8 Same as above but using \begin{displaymath} to enter a math environment

Note: \begin{displaymath} produces LaTeX error. Use \begin{displaymath} instead.

Case 8a Same as above but using \begin{displaymath} to enter a math environment

Case 9 Same as above but using $$ to enter a math environment

Note: Delimiting an equation by $$ is a plain\TeX command and should \textit{not} be used in \LaTeX documents.
11 Large Delimiters

11.1 Determinant

\[ \det A = \begin{vmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{vmatrix} \]

11.2 Mixed Delimiters

\[ w = \left| 4x^3 + \left( (x - y) + \frac{42}{1 + x^4} \right) \right|. \]

11.3 Submatrices

\[ A = \begin{vmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{vmatrix} \begin{vmatrix} a_{12} & \cdots & a_{1n} \\ a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m2} & \cdots & a_{mn} \end{vmatrix} \]

11.4 Fractions

Simple

\[ \frac{x}{y} \]

More complicated

\[ \frac{x + 1}{\frac{y + z}{w}} \]

Missing braces

\[ \frac{x}{y} \]

Including braces

\[ \frac{x + y}{w} \]

Including left

\[ \frac{\{\sqrt{y + z}\}}{w} \]
12 fields

Problem with mbox containing $ in a field

\[ x[l] \leftarrow x[(l + m) \mod n] \oplus \text{shiftright}(x[l]) \oplus \begin{cases} 0 & \text{if LSB of } x[l] = 0 \\ b & \text{if LSB of } x[l] = 1, \end{cases} \]

problem with correctly delimiting the above equation

\[ x[l] \leftarrow x[(l + m) \mod n] \oplus \text{shiftright}(x[l]) \oplus \begin{cases} 0 & \text{if LSB of } x[l] = 0 \\ b & \text{if LSB of } x[l] = 1, \end{cases} \]

Look at the position of the superscript in this:

\[
\begin{bmatrix}
1 & 2 & 3 \\
4 & 5 & 6 \\
7 & 8 & 9
\end{bmatrix}^T
\]

or the superscript and subscript superposition:

\[ s = \sum_{i=1}^{n} x_i^2 \]

or embedded sub/superscripts:

\[ s_n = s^{n^2} \]

and

\[ s_n = s^{n^2} \]