1 looking at font styles in equations

For eample, in

$$\mathbf{n}(t+1) = A\mathbf{n}(t)\mathrm{Q}$$

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.

$$\begin{aligned} zw &= (3+2i)(2-i) \\ &= 6-3i+4i-2i^2 \\ &= 8+i \end{aligned}$$

$$\begin{aligned} zw &= (3+2i)(2-i) \\ &= 6-3i+4i-2i^2 \\ &= 8+i \end{aligned}$$

Now align with an asterisk.

$$\begin{aligned} zw &= (3+2i)(2-i) \\ &= 6-3i+4i-2i^2 \\ &= 8+i \end{aligned}$$

3 testing equation references

$$x = y \tag{1}$$

The equation before this is equation 1. Alternatively one might use (1).

4 reported (non-) problems in 1.9.15

First commas in equations

$$\text{for } x, y \text{ in } A$$

as an inline $\forall x, y \in Z$. Yet another comma example R_1, R_2

Now for the problem associated with `\sum`

$$\sum = 1$$

5 Inline equations

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

Lets test baselines of equations. First compare these ..... as well as ..... Now descenders like y y and finally x^2 vs x^2 or x_2 vs x_2

Parsing the tricky `$$` properly ε_o 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 `\(` and `\)` 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

$$\begin{aligned} \ldots &= b \\ c &= d \end{aligned}$$

Note: Delimiting an equation by `$$` is a plainTEX 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

$$\nabla^2\phi - \frac{1}{c}\frac{\partial\phi}{\partial t} = 0 \tag{2}$$

Note that `\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.

$$\begin{aligned} z &= w + x + \\ &\quad 5w - 8c \end{aligned}$$

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

$$\begin{aligned} z &= w + x + && (3)\\ &\quad 5w - 8c && (4) \end{aligned}$$

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

$$\begin{aligned} z &= w + x && (5)\\ z &= w + x \\ z &= w + x && (6) \end{aligned}$$

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

$$\begin{aligned} z &= w + x \\ z &= w + x \\ z &= w + x \end{aligned}$$

9 Equation numbering test

This equation needs a number

$$\varphi = \left|\begin{array}{c}\psi_1\\ \psi_2\end{array}\right|; \quad \text{and} \quad \chi = \left|\begin{array}{c}\psi_3\\ \psi_4\end{array}\right|; \quad \text{or} \quad \eta = \left|\begin{array}{c}\tilde{\psi}_1\\ \tilde{\psi}_2\end{array}\right|; \quad \text{and} \quad \lambda = \left|\begin{array}{c}\tilde{\psi}_3\\ \tilde{\psi}_4\end{array}\right|; \tag{7}$$

more text following

10 Testing math environment closing

For a while, getting `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 `$a+\bf R$` follows $a + \mathbf{R}$ which should make "a" italic and "R" bold

Case 3 Same as above but using `\(` to enter a math environment $a + \mathbf{R}$ roman type follows

Case 4 Same as above but using `\[` to enter a math environment

$$a + \mathbf{R}$$

roman type follows

Case 5 Same as above but using `\begin{math}` to enter a math environment $a + \mathbf{R}$ roman type follows

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

$$a + \mathbf{R} \tag{8}$$

roman type follows

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

$$a + \mathbf{R} \tag{9}$$

roman type follows

Case 8 Same as above but using `\begin{equation*}` to enter a math environment
Note: `\begin{equation*}` produces LaTeX error.
Use `\begin{displaymath}` instead.

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

$$a + \mathbf{R}$$

roman type follows

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

$$a + \mathbf{R}$$

roman type follows

Note: Delimiting an equation by `$$` is a plainTEX command and should *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

$$A = \begin{bmatrix} \begin{vmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{vmatrix} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

11.4 Fractions

Simple

$$\frac{x}{y}$$

More complicated

$$\frac{x+1}{\frac{x+2}{y+z+w}}$$

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

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

problem with correctly delimiting the above equation $x[l] \leftarrow x[(l+m) \bmod n] \oplus \text{shiftright}(x[l]) \oplus \begin{cases} 0 & \text{if LSB of } x[l]{=}0 \\ b & \text{if LSB of } x[l]{=}1, \end{cases}$

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

$$s_n = s^{n_2}$$