

1 Heading

Some text

A Sample Article

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Abstract

This article illustrates many features of a mathematics document created with Scientific Word or Scientific Workplace.

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1

$$w + x + y + z = a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p$$

If $f(x) = x + 1$, then we will have

$$f([x + 1]/[x + 2]) = \{[x + 1]/[x + 2]\} + 1 = (2x + 3)/(x + 2)$$

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 = 190$$

$$\max(f, g) = \frac{f + g + |f - g|}{2}, \quad (3)$$

$$\max(f, -g) = \frac{f - g + |f + g|}{2}. \quad (4)$$

$$(a + b)^{n+1} = (a + b)(a + b)^n = (a + b) \sum_{j=0}^n \binom{n}{j} a^{n-1} b^j \quad (5)$$

$$= \sum_{j=0}^n \binom{n}{j} a^{n+1-j} b^j + \sum_{j=1}^n \binom{n}{j-1} a^{n-1} b^j \quad (6)$$

$$= \sum_{j=0}^n \binom{n+1}{j} a^{n+1-j} b^j. \quad (7)$$

The equations in the display immediately above are (5), (6), and (7).

You can have subequation numbering generated automatically, illustrated in the following:

$$x = a + b \quad (8a)$$

$$y = c + d \quad (8b)$$

$$z = e + f \quad (8c)$$

This is text between the two sets of equations. The following set of equations continues the numbering from the set above.

$$u = g + h \quad (8d)$$

$$v = i + j \quad (8e)$$

$$w = k + l \quad (8f)$$

5

1.1 Mathematics and Text

Let H be a Hilbert space, C be a closed bounded convex subset of H , T a nonexpansive self map of C . Suppose that as $n \rightarrow \infty$, $a_{n,k} \rightarrow 0$ for each k , and $\gamma_n = \sum_{k=0}^{\infty} (a_{n,k+1} - a_{n,k})^+ \rightarrow 0$. Then for each x in C , $A_n x = \sum_{k=0}^{\infty} a_{n,k} T^k x$ converges weakly to a fixed point of T [5].

In this situation, we would also like to cite [1, 2, 3, 4, 6], but we do so only to demonstrate a citation with multiple entries.

1.2 In-line and Displayed Mathematics

The equation

$$u_{tt} - \Delta u + u^5 + u|u|^{p-2} = 0 \text{ in } \mathbf{R}^3 \times [0, \infty[. \quad (1)$$

is numbered and it also has the label “wave”. You can use this label to jump to this equation using hypertext links. You can reference this equation within your document as equation 1.

There are two sets of $\text{\LaTeX}$ parameters governing mathematical displays. The spacing left above and below a display depends on whether the lines above or below are short or long.

Short above

$$x^2 + y^2 = z^2$$

short below.

Long above. This may depend on your margins. Avoid wrapping.

$$\sin^2 \theta + \cos^2 \theta = 1$$

and long below. You don't have to worry about this line being long enough in most circumstances because we've tried to ensure that it will wrap no matter how wide you have your margins set.

1.3 Multi-Line Displays

Scientific Word and *WorkPlace* provide a range of alignment options for multiline mathematical displays. Here is a series of multiline displays.

$$x = 17y \quad (1)$$

$$y > a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p \quad (2)$$

$$\begin{aligned} x &\ll y_1 + \cdots + y_n \\ &\leq z \end{aligned}$$

$$y = a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p$$

4

Test the overriding of automatic equation labels:

$$x = y + z \quad (\text{A-1})$$

$$= k + m \quad (\text{A-2})$$

Test the overriding of automatic equation labels, suppressing annotation:

$$x = y + z \quad \text{A-1}$$

$$= k + m \quad \text{A-2}$$

The labels in the first set of equations should be parenthesized, while the labels in the second set should not be parenthesized.

There is a significant difference between the standard $\text{\LaTeX}$ equation array and the AMS align environment. *SW/SWP* does not show this difference on screen. To check this difference, look at the Typeset Preview versions of the following.

$$\begin{aligned} x &= y \\ &= z \end{aligned}$$

$$\begin{aligned} x &= y \\ &= z \end{aligned}$$

The space around the = sign in the first set of equations (the $\text{\LaTeX}$ equation array) is much greater than in the second set (the AMS align environment). The spacing in the second set is preferred, as it agrees with the spacing in a single-line display:

$$x = y$$

To convert the $\text{\LaTeX}$ equation array to the AMS align environment, select the equations, then from the Edit menu, choose Properties. Select Advanced and then select Enable Alignment.

2 Mathematics in section heads $\int_{\alpha}^{\beta} \ln t dt$

You ought to be able to put mathematics in section heads. It might be a problem in style with running headers and table of contents entries.

2.1 Theorems, Lemmata, Etc.

You can automatically number theorems and other proclamations¹. This is a marginal marginal note. These theorem-like environments are available.

¹Such as propositions, lemmas and corollaries. You can create your own theorem-like environments to extend the basic set provided with *SW*.

Marginal notes are like call-outs in graphics. You can bring the reader's attention to a point made in the text. Marginal notes can have multiple paragraphs.

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1 A Sample Article

This document illustrates a wide range of the symbols and constructs available to you. This document is set up to compile with the standard and multilingual format files. In particular, certain characters from the Latin-1, Latin Extended-A, and General Punctuation symbol panels will typeset as ??? if a multilingual format file such as TrueTeX MultiLingual is not used.

3 Section Heading

This is body text following a section heading.

3.1 Subsection Heading

This is body text following a subsection heading.

3.1.1 Subsubsection Heading

This is body text following a subsubsection heading.

Subsubsubsection Heading This is body text following a subsubsubsection heading.

Subsubsubsubsection Heading This is body text following a subsubsubsubsection heading.

4 Another Section Heading

If this section is numbered, check that it is numbered correctly.

4.1 Another Subsection Heading

If this subsection heading is numbered, check that it is numbered correctly.

4.1.1 Another Subsubsection Heading

If this subsubsection heading is numbered, check that it is numbered correctly.

Another Subsubsubsection Heading If this subsubsubsection heading is numbered, check that it is numbered correctly.

Another Subsubsubsubsection Heading If this subsubsubsubsection heading is numbered, check that it is numbered correctly.

The sections above are sections 3, 3.1, 3.1.1, 3.1.1, 3.1.1, 4, 4.1, 4.1.1, 4.1.1, 4.1.1.

Starred Sections

With version 4, SW/SWP now provides user access to the `\section*` command. To adjust this on an existing section heading, position the cursor on the left side of the section. Use edit properties or the context menu from the right mouse button to bring up the Section Properties dialog. Starred sections are not numbered and do not appear in the table of contents when a document is

typeset. A better way to handle this is to set the section numbering counter depth.

Starred Subsection

Starred Subsubsection

Starred Subsubsubsection

Starred Subsubsubsubsection

5 Sections with Optional Arguments

Optional arguments to sections are entered by putting them in square brackets at the start of the heading text. These optional arguments are used for the short form of a heading in running heads and in the table of contents

5.1 Subsection

5.1.1 Subsubsection

Subsubsubsection

Subsubsubsubsection

5.2 Lists

5.2.1 Numbered Lists

1. First numbered item, level 1.
 - (a) First numbered item, level 2.,
 - i. First numbered item, level 3.
 - A. First numbered item, level 4.
 - B. Second numbered item, level 4.
 - ii. Second numbered item, level1 3.
 - (b) Second numbered item, level 2.
2. Second numbered item, level 1.
 - (a) First numbered item, level 2.
 - i. First numbered item, level 3.
 - A. First numbered item, level 4.
 - B. Second numbered item, level 4.
 - ii. Second numbered item, level1 3.

- (b) Second numbered item, level 2.

The items above are numbered 1, 1a, 1(a)i, 1(a)iA, 1(a)iB, 1(a)ii, 1b, 2, 2a, 2(a)i, 2(a)iA, 2(a)iB, 2(a)ii, 2b in that order.

Here is a list with multiple levels on one line. There should be five lines, only. Items should not be split out on separate lines.

1. First item, normal.
2. (a) Second item, both numbers.
3. (a) i. Third item, three numbers.
4. (a) i. A. Fourth item, four numbers.
5. (a) i. A. Fifth item. Second, third, and fourth numbers.

Here is a list with continuation items.

1. Level 1, first paragraph.
Level 1, second paragraph.
 - (a) Level 2, first paragraph.
Level 2, second paragraph.
 - i. Level 3, first paragraph.
Level 3, second paragraph.
 - A. Level 4, first paragraph.
Level 4, second paragraph.

5.2.2 Bulleted Lists

- Bullet item, level 1.
 - Bullet item, level 2.
 - * Bullet item, level 3.
 - Bullet item, level 4.

- Bullet item, level 1.

This is a continuation paragraph in a bullet item. The paragraph has been made long enough to wrap, and so wrap it will. The question is, do you like wrap? Is it your taste in music?

- Bullet item, level 2.

This is a continuation paragraph in a bullet item. The paragraph has been made long enough to wrap, and so wrap it will. The question is, do you like wrap?

* Bullet item, level 3.

This is a continuation paragraph in a bullet item. The paragraph has been made long enough to wrap, and so wrap it will. The question is, do you like wrap?

· Bullet item, level 4.

This is a continuation paragraph in a bullet item. The paragraph has been made long enough to wrap, and so wrap it will. The question is, do you like wrap?

5.2.3 Custom Lists

gnat A small animal, found in the North Woods, that causes no end of trouble.

gnu A large animal, found in crossword puzzles, that causes no end of trouble.

armadillo A medium-sized animal, named after a medium-sized Texas city. A medium-sized animal, named after a medium-sized Texas city.

A very long custom label here There should be enough text following to allow the paragraph to wrap to the next line.

Here is a continuation paragraph of the above custom item.

5.2.4 Lists with custom lead-ins.

Numbered lists with custom lead-ins.

Number 1: First numbered item

Number 2: Second numbered item

Number 3: Third numbered item

Number 3.a: First item under Number 3

Number 3.a.i: First item under Number 3.a:

Number 3.a.i.1: First item under Number 3.a.i:

Number 3.a.i.2: Second item under Number 3.a.i:

Continuation paragraph under the second item under Number 3.a.i:

Bulleted lists with custom lead-ins.

Bullet: First item

Bullet: Second item

Bullet: Third item

Square: First item under the third item

Name	L ^A T _E X2.09	L ^A T _E X2e	Example
Italic	<code>\it text</code>	<code>\textit{text}</code>	<i>text</i>
Bold	<code>\bf text</code>	<code>\textbf{text}</code>	text
Small Caps	<code>\sc text</code>	<code>\textsc{text}</code>	<i>text</i>
Sans Serif	<code>\sf text</code>	<code>\textsf{text}</code>	text
Slant	<code>\sl text</code>	<code>\textsl{text}</code>	<i>text</i>
Typewriter	<code>\tt text</code>	<code>\texttt{text}</code>	text
Emphasis	NA	NA	NA
Roman	<code>\rm text</code>	<code>\textrm{text}</code>	text

SMALL CAPS HERE!

This sentence is slanted.

This is math $[x + \textit{italic} + y + \textsf{sansserif} + \textbf{bold} + \text{roman}]$

Here is a display

$$x + \text{text} + y + \text{roman} + \text{roman text}$$

and then we finish off the paragraph with great alacrity.

Now we use italics. Here is a display

$$x + \text{text} + y + \text{roman} + \text{roman text}$$

and then we finish off the paragraph with great alacrity.

This is a paragraph of italic text with a stretch of roman in the middle.

You obtain `\mathrm` by applying `roman` to a selection in math, and you obtain `\textrm` by applying `text` and then applying `roman`. $[x + \text{roman} + \text{textroman}]$

7.3 Bold Symbol

Bold Symbol is a special tag you can apply in math to build italic bold symbols.

For example: ***m***. (Compare with **m**). Another examples: ***2πi ≠ ẋ***.

7.4 Calligraphic, Fraktur and Blackboard Bold

These are math-only tags.

CALLIGRAPHIC

fraktur

BLACKBOARDBOLD

8 The `\text` Command

SW writes text in mathematics using the AMS `\text` command. This is the only command for text in mathematics that reduces size appropriately when smaller fonts are called for in L^AT_EX2.09. The `\rm` switch also works in L^AT_EX2e. Here is text in mathematics at various sizes:

$$X^{x+\text{text}^{x+\text{text}}} + \text{text}$$

More text