

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 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.

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 L^AT_EX 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 multi-line mathematical displays. Here is a series of multiline displays.

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

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

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

$$\begin{aligned} y &= a + b + c + d + e + f + g + h + i + j \\ &\quad + k + l + m + n + o + p \end{aligned}$$

$$\begin{aligned}
w + x + y + z &= \\
& a + b + c + d + e + f + g + h + i + j + \\
& k + l + m + n + o + p
\end{aligned}$$

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

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

$$\begin{aligned}
& 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 \\
& + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20 = 190
\end{aligned}$$

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

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

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

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

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

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.

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

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

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

Test the overriding of automatic equation labels:

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

$$= k + m \tag{A-2}$$

Test the overriding of automatic equation labels, suppressing annotation:

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

$$= k + m \tag{A-2}$$

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 L^AT_EX 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.

$$\begin{array}{l} x = y \\ = z \end{array}$$

$$\begin{array}{l} x = y \\ = z \end{array}$$

The space around the = sign in the first set of equations (the L^AT_EX 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 L^AT_EX 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.

Acknowledgement 1 *This is an acknowledgement*

Algorithm 2 *This is an algorithm*

Axiom 3 *All mathematics is fun.*

Case 4 *This is a case*

Claim 5 *This is a claim*

Conclusion 6 *This is a conclusion*

Condition 7 *This is a condition*

Conjecture 8 *Some people don't like mathematics.*

Corollary 9 *This is a corollary*

Criterion 10 *This is a criterion*

Definition 11 *This is a definition*

Example 12 *This is an example*

Exercise 13 *This is an exercise*

Lemma 14 *The plural of lemma is lemmata, so they say. Why all these lemmas?*

Proof. This is the proof of the lemma.

Notation 15 *This is notation*

Problem 16 *This is a problem*

Proposition 17 *This is a proposition*

Remark 18 *This is a remark*

Summary 19 *This is a summary*

Theorem 20 (Main Theorem) *Suppose $u_0 \in C^3(\mathbf{R}^3)$, $u_1 \in C^2(\mathbf{R}^3)$ have finite energy*

$$\int_{\mathbf{R}^3} \left(\frac{|u_1|^2 + |\nabla u_0|^2}{2} + \frac{|u_0|^6}{6} \right) dx < \infty \quad (9)$$

and suppose the solution $u^{(0)}$ to the homogeneous wave equation with initial data u_0, u_1 is uniformly bounded. Then there exists $\epsilon_0 > 0$ such that for $|\epsilon| < \epsilon_0$ the initial value problem (1) with data $\epsilon u_0, \epsilon u_1$ admits a global C^2 -solution.

Proof. This is the proof.

Footnotes, such as this, can have several paragraphs. Each paragraph can be as large as you want. You can include mathematics, graphics, or anything else you can enter in main-document paragraphs. It is even possible to compare the difference between an in-line sum $\sum_{n=1}^{\infty} \frac{1}{n^2}$ and a displayed sum

$$\sum_{n=1}^{\infty} \frac{1}{n^2}$$

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

Triangle: First item under the first item under the third item

elgnairT: First item under the first item under the first item under the third item

elgnairT: Second item under the first item under the first item under the third item

Continuation paragraph under the second item under the first item under the third item

Lists with multiple lead-ins per line.

1. First
2. (a) Second, First
3. (a) i. Third, First, First
4. (a) i. A. Fourth, First, First, First
1. Reset to First
2. (a) Second, First
 - (b) i. None, Second, First
 - ii. A. None, None, Second, First

Lists with complex custom items.

$\int \sin x dx$ Lead-in is $\int \sin x dx$

$\mathfrak{A}\mathfrak{B}\mathfrak{C}$ Lead-in is $\mathfrak{A}\mathfrak{B}\mathfrak{C}$

$\sqrt[3]{3}$ If the leadin contains an item with an optional parameter, that item should be in a group to prevent the closing bracket of the optional argument from closing the item brackets.

 Lead-in is 

Lists whose items contain notes

1. A footnote²
2. A margin note
 - (a) A footnote with lists.³
 - (b) A margin note with lists.

²This footnote is in a list item

³A list in a footnote:

This marginal note is in a list item

A list in a margin note:

- i. First item
- ii. Second item
 - A. First item
 - B. Second item

5.3 Block Quote and Centered

In addition to Body Text, there are paragraph tags named Block Quote and Center. Here is a Block Quote paragraph.

Why, there, there, there, there! A diamond gone, cost me two thousand ducats in Frankfort! The curse never fell upon our nation till now; I never felt it till now. Two thousand ducats in that, and other precious, precious jewels. I would my daughter were dead at my foot, and the jewels in her ear! Would she were hearsed at my foot, and the jewels in her coffin! No news of them? Why, thou loss upon loss! The thief gone with so much, and so much to find the thief, and no satisfaction, no revenge! Nor no ill luck stirring but what lights o' my shedding.

Here is a centered paragraph:

Nay, that's true, that's very true. Go, Tubal, fee me an officer; bespeak him a fortnight before. I will have the heart of him if he forfeit, for were he out of Venice I can make what merchandise I will. Go, Tubal, and meet me at our synagogue; go, good Tubal; at our synagogue, Tubal.

5.4 Footnotes and Marginal Notes

In this section, we insert multiple footnotes and multiple marginal notes. This illustrates the various parameters used to separate multiple footnotes and marginal paragraphs.⁴⁵⁶⁷

The first in a series of marginal notes. The second in a series of marginal notes. The third in a series of marginal notes. The fourth in a series of marginal notes.

6 Cross-References and Their Ilk

The section on theorems is numbered 2.1 and is on page 6. The current section (on cross-references and their ilk) is numbered 6 and is on page 13.

7 Text Tags

Text tags are the tags you apply to text within a paragraph, to distinguish phrases. There are tags for physical phrase markup and tags for logical phrase markup.

-
- i. First item
 - ii. Second item
 - A. First item
 - B. Second item

⁴The first in a series of consecutive footnotes.

⁵The second in a series of consecutive footnotes.

⁶The third in a series of consecutive footnotes.

⁷The fourth in a series of consecutive footnotes.

This section discusses the differences between some aspects of the $\text{\LaTeX}$ coding *SW* uses in $\text{\LaTeX}2.09$ and $\text{\LaTeX}2e$ documents. In $\text{\LaTeX}2.09$, the commands for what we call *tagged runs*, including boldface, italics, and emphasis, are switches. In $\text{\LaTeX}2e$, the switch commands are still available, but use of the new macro forms is strongly encouraged. We at TCI agree with this wholeheartedly—switches are an abomination and have caused us no end of trouble in the past. The new macro forms of the tagged runs also have additional capabilities, most of which are supported in *SW*.

7.1 Tagged Runs in Text

Here is a comparison of the tagged runs in text.

Name	$\text{\LaTeX}2.09$	$\text{\LaTeX}2e$	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>	TEXT
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	<code>\em text</code>	<code>\em text</code>	<i>text</i>
Roman	<code>\rm text</code>	<code>\textrm{text}</code>	text

7.2 Tagged Runs in Mathematics

All of the text tagged runs are also valid in mathematics. Since *SW* works very hard to provide a minimal nesting level of tags, these must be shown in an environment that forces math. Within that environment (here, a pair of empty expanding brackets), we select text in addition to the tagged run.

Name	$\text{\LaTeX}2.09$	$\text{\LaTeX}2e$	Example
Italic	<code>\$\text{\it text}\$</code>	<code>\$\textit{text}\$</code>	<i>text</i>
Bold	<code>\$\text{\bf text}\$</code>	<code>\$\textbf{text}\$</code>	text
Small Caps	<code>\$\text{\sc text}\$</code>	<code>\$\textsc{text}\$</code>	TEXT
Sans Serif	<code>\$\text{\sf text}\$</code>	<code>\$\textsf{text}\$</code>	text
Slant	<code>\$\text{\sl text}\$</code>	<code>\$\textsl{text}\$</code>	<i>text</i>
Typewriter	<code>\$\text{\tt text}\$</code>	<code>\$\texttt{text}\$</code>	text
Emphasis	<code>\$\text{\em text}\$</code>	<code>\$\em text\$</code>	<i>text</i>
Roman	<code>\$\text{\rm text}\$</code>	<code>\$\textrm{text}\$</code>	text

The coding of the above tagged runs presents a number of problems for the filter. There is now an option to use `\textrm` or `\mbox` in place of the `\text` command.

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`. $[x + \text{roman} + \text{textrm}]$

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:

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

and the same, attempted with `\rm`:

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

and with `\mbox`:

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

9 Operators

The following is a list of operators from the INSERT, OPERATOR... menu selection.

$\int$	$\iint$	$\iiint$	$\iiiii$	$\int \cdots \int$	$\oint$	Σ	Π	$\cap$
$\bigwedge$	$\bigoplus$	$\bigodot$	$\bigsqcup$	$\coprod$	$\bigcup$	$\bigvee$	$\bigotimes$	$\biguplus$

The following is a list of operators from the INSERT, OPERATOR... menu selection. In this example, all operators are set to “Big,” while all limit positions are set “at right.”

$\int_b^a$	$\iint_{A^{100}}^b$	$\iiint_{\Delta} dV$	$\iiiii_{what?} dT$	$\int \cdots \int d \cdots$
$\bigwedge_i x_i$	$\bigoplus X_i$	$\bigodot_{\nu \neq v} \Psi_{\nu}$	$\bigsqcup_{\xi=\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}} \xi$	$\prod^{A \text{ small paragraph}} \Xi_i$

$\oint_{\Gamma} d\gamma$	$\sum_{x=1}^5 \frac{1}{x^2}$	$\prod_{x=5}^7 (1 - \sqrt{x})$	$\bigcap_{A \in \mathbf{A}} A$
$\bigcup_{x^{xx}} U_x$	$\bigvee_{f^i} y^i$	$\bigotimes_{\mu \in \{1,2,5,7\}} \Phi_{\mu}$	$\biguplus_{Blow}^{Joe} B$

The following is a list of operators from the INSERT, OPERATOR... menu selection. In this example, all operators are set to “Small,” while all limit positions are set “at right.”

$\int_b^a x dx$	$\iint_A \frac{dx dy}{xy}$	$\iiint_{\Delta} dV$	$\iiiii_{what?} dT$	$\int \cdots \int \cdots d \cdots$
$\bigwedge_i x_i$	$\bigoplus^{100} X_i$	$\bigodot_{\nu \neq v} \Psi_{\nu}$	$\bigsqcup_{\xi=\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}} \xi$	$\prod^{A \text{ small paragraph}} \Xi_i$

$\oint_{\Gamma} d\gamma$	$\sum_{x=1}^5 \frac{1}{x^2}$	$\prod_{x=5}^7 (1 - \sqrt{x})$	$\bigcap_{A \in \mathbf{A}} A$
$\bigcup_{x^{xx}} U_x$	$\bigvee_{f^i} y^i$	$\bigotimes_{\mu \in \{1,2,5,7\}} \Phi_{\mu}$	$\biguplus_{Blow}^{Joe} B$

The following is a list of operators from the INSERT, OPERATOR... menu selection. In this example, all operators are set to “Big,” while all limit positions are set “Above/below.”

$\int_b^a x dx$	$\iint_A \frac{dx dy}{xy}$	$\iiint_{\Delta} dV$	$\iiint \int_{\text{what?}} dT$	$\int \cdots \int d \cdots$
$\bigwedge_i x_i$	$\bigoplus_{100} X_i$	$\bigodot_{\nu \neq v} \Psi_\nu$	$\bigsqcup_{\xi = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}} \xi$	$\prod_{\text{A small paragraph}} \Xi_i$

$\oint_{\Gamma} d\gamma$	$\sum_{x=1}^5 \frac{1}{x^2}$	$\prod_{x=5}^7 (1 - \sqrt{x})$	$\bigcap_{A \in \mathbf{A}} A$
$\bigcup_{x^x} U_x$	$\bigvee_{\int i} y^i$	$\bigotimes_{\mu \in \{1,2,5,7\}} \Phi \mu$	$\biguplus_{\text{Blow}}^{Joe} B$

9.1 Multi-Line Subscripts and Superscripts

$$\sum_{\substack{1 \leq i \leq 10 \\ 1 \leq j \leq 10}} 2^{i+j} \text{ is more reasonable than } \Gamma_{1234567}^{1234567}$$

10 Brackets

The following is a list of the different brackets from the INSERT, BRACKETS... menu selection.

$\left(\frac{a}{x}{y}\right)$	$\lfloor \frac{E}{X} \rfloor$	$/\frac{\mathbf{I}}{\mathbf{J}}/$	$\updownarrow \frac{m}{m} \updownarrow$	$\updownarrow \frac{Q}{Q} \updownarrow$	$\}\mathcal{U}\{$
$\left[\frac{b}{x}{y}\right]$	$\lceil \frac{F}{X} \rceil$	$\backslash \frac{\mathbf{J}}{\mathbf{L}} \backslash$	$\uparrow \frac{n}{n} \uparrow$	$\frac{R}{R} \frac{R}{R}$	$]\mathcal{V}[$
$\left\{\frac{c}{x}{y}\right\}$	$ \frac{G}{X} $	$\updownarrow \frac{\mathbf{K}}{\mathbf{L}} \updownarrow$	$\upuparrows \frac{o}{o} \upuparrows$	$\frac{S}{S} \frac{S}{S}$	$)\mathcal{W} ($
$\left\langle \frac{d}{x}{y} \right\rangle$	$\ \frac{H}{X} \ $	$\frac{\mathbf{L}}{\mathbf{X}}$	$\downarrow \frac{p}{p} \downarrow$	$\left\langle \frac{T}{T} \right\rangle$	

11 Math Names

The following is a sample of names from the INSERT, MATH NAME... menu selection. Some are standard, built-in names: $\ln x$, $\sin^2 x$, $\arg \tanh \pi$. Or you can make up your own: $\overset{a \in B}{\text{above}}(\{a\})$, $\text{right}_{b \in A}(\{b\})$, $\text{func}(x)$.

12 Binomials

The following is a list of operators from the INSERT, BINOMIALS... menu selection.

$\binom{2}{3}$	$\binom{3}{4}$	$\binom{4}{5}$	$\binom{5}{6}$	$\binom{6}{7}$	$\binom{7}{8}$	$\binom{8}{9}$	$\binom{9}{0}$	$\binom{0}{1}$	$\binom{1}{2}$	$\binom{2}{3}$	$\binom{3}{4}$	$\binom{4}{5}$	$\binom{5}{6}$
$\binom{4}{5}$	$\binom{5}{6}$	$\binom{6}{7}$	$\binom{7}{8}$	$\binom{8}{9}$	$\binom{9}{0}$	$\binom{0}{1}$	$\binom{1}{2}$	$\binom{2}{3}$	$\binom{3}{4}$	$\binom{4}{5}$	$\binom{5}{6}$	$\binom{6}{7}$	$\binom{7}{8}$

You can modify the thickness of the line: none $\binom{q}{p}$, normal $\binom{q}{p}$, thick $\binom{q}{p}$.

And the size : auto $\binom{q}{p}$, big $\binom{q}{p}$, small $\binom{q}{p}$. In a display, the auto should become big:

$$\text{auto } \binom{q}{p}, \text{ big } \binom{q}{p}, \text{ small } \binom{q}{p}$$

And you can make binomials with no delimiters: none $\frac{q}{p}$, normal $\frac{q}{p}$, thick $\frac{q}{p}$.

13 Labels

Use INSERT, LABEL... to build labels above or below. $A \xrightarrow{f(x)} B$ or $A^* \xleftarrow[f^{-1}]{} B^*$.

14 Decorations

The following is a list of decorations from the INSERT, DECORATIONS... menu selection.

$\frac{1}{1+a^2}$	$\frac{1}{1+d^2}$	$\frac{1}{1+g^2}$	$\frac{1}{1+j^2}$	$\frac{1}{1+m^2}$	$\frac{1}{1+b^2}$	$\frac{1}{1+e^2}$
$\frac{1}{1+h^2}$	$\frac{1}{1+k^2}$	$\frac{1}{1+n^2}$	$\frac{1}{1+c^2}$	$\frac{1}{1+f^2}$	$\frac{1}{1+i^2}$	$\frac{1}{1+l^2}$

15 The Symbols

Here are the symbols on the panels.

Note: If you typeset this document and do not use a multilingual format file such as TrueTeX MultiLingual, several characters in the Latin-1, Latin Extended-A, and General Punctuation panels will not typeset properly and will instead appear as ??? in the typeset document.

15.1 Lowercase Greek

α	β	γ	δ
ϵ	ε	ζ	η
θ	ϑ	ι	κ
λ	μ	ν	ξ
π	ϖ	ρ	σ
ς	τ	υ	ϕ
φ	χ	ψ	ω
κ	ϱ		

15.2 Uppercase Greek

Γ	Δ
Θ	Λ
Ξ	Π
Σ	Υ
Φ	Ψ
Ω	$\mathcal{F}$

15.3 Binary Operations

$\pm$	$\mp$	$\times$	$\cdot$	$*$
$\cup$	$\cap$	$\circ$	$\bullet$	$\div$
$\sqcup$	$\sqcap$	$\bigcirc$	$\backslash$	$\diagdown$
$\oplus$	$\ominus$	$\otimes$	$\odot$	$\circledast$
$\vee$	$\wedge$	$\odot$	$\triangleleft$	$\triangleright$
$\vee$	$\bar{\wedge}$	$\wr$	$\triangleleft$	$\triangleright$
$\boxplus$	$\bar{\wedge}$	Π	$\triangleleft$	$\triangleright$
∇	$\triangle$	$\diamond$	$\dagger$	$\ddagger$
$\boxplus$	$\boxminus$	$\boxtimes$	$\boxdot$	$\oslash$
Ψ	$\mathbb{M}$	$\times$	$\times$	$\star$
Υ	λ	λ	$\angle$	$\top$
$\dagger$	$\ominus$	$*$	$\cdot$	f
$\&$				

15.4 Binary Relations

[illegible]

15.5 Negated Relations

[illegible]

15.6 Arrows

$\leftarrow$	$\Leftarrow$	$\rightarrow$	$\Rightarrow$	$\leftrightarrow$
$\Leftrightarrow$	$\mapsto$	$\curvearrowright$	$\lrcorner$	$\intercal$
$\Uparrow$	$\Uparrow$	$\Downarrow$	$\Downarrow$	$\Updownarrow$
$\longleftarrow$	$\Longleftarrow$	$\longrightarrow$	$\Longrightarrow$	$\longleftrightarrow$
$\longleftrightarrow$	$\mapsto$	$\curvearrowright$	$\lrcorner$	$\intercal$
$\rightsquigarrow$	$\Updownarrow$	$\nearrow$	$\searrow$	$\swarrow$
$\nearrow$	$\circlearrowleft$	$\circlearrowright$	$\parallel$	$\equiv$
$\rightarrow$	$\leftarrow$	$\rightleftarrows$	$\rightleftarrows$	$\rightleftarrows$
$\Downarrow$	$\uparrow$	$\downarrow$	$\downarrow$	$\downarrow$
$\mapsto$	$\leftarrow$	$\rightleftarrows$	$\rightleftarrows$	$\rightleftarrows$
$\curvearrowright$	$\rightsquigarrow$	$\rightsquigarrow$	$\curvearrowleft$	$\curvearrowright$
$\circ$	$\Rightarrow$	$\Leftarrow$	$\hookrightarrow$	$\hookrightarrow$
$\dashrightarrow$	$\dashleftarrow$	$\Longrightarrow$	$\Longleftarrow$	$\longleftrightarrow$

15.7 Miscellaneous

∞	∂	$\dots$	$\dots$	$\vdots$	$\ddots$
$\mathbb{I}$	$\mathbb{J}$	ℓ	$\wp$	$\hbar$	$\hbar$
$\forall$	$\exists$	$\nexists$	$\Re$	$\Im$	$\aleph$
$\lrcorner$	$\lrcorner$	$\emptyset$	$\emptyset$	$\diagup$	$\diagdown$
∇	$\surd$	$\top$	$\perp$	∂	λ
$\angle$	$\angle$	$\triangleleft$	$\textcircled{S}$	$\mathcal{L}$	$\mathcal{F}$
$\sqsubset$	$\mathbb{C}$	$\mathbb{J}$	$\mathbb{D}$	$\star$	$\parallel$
$\square$	$\blacksquare$	$\diamond$	$\diamond$	$\blacklozenge$	$\diagdown$
$\triangle$	$\blacktriangle$	∇	$\blacktriangledown$	$\dagger$	$\ddagger$
$\sqsupset$	$\mathbb{I}$	$\lrcorner$	$\sharp$	$\flat$	$\natural$
$\clubsuit$	$\diamond$	$\heartsuit$	$\spadesuit$	$\surd$	$\otimes$
$\mathbb{k}$	$\mathbb{C}$	$\mathbb{N}$	$\mathbb{Q}$	$\mathbb{R}$	$\mathbb{Z}$
$\pounds$	$\pounds$	TM	Y	E	F
E	Ps	TM	U	$:$	

15.8 Delimiters

$\lfloor$	$\rfloor$
$\lceil$	$\rceil$
$\langle$	$\rangle$
$\lceil$	$\rceil$
$\lfloor$	$\rfloor$

15.9 Latin-1

	°	À	Ð	à	ð
ì	±	Á	Ñ	á	ñ
¢	²	Â	Ò	â	ò
£	³	Ã	Ó	ã	ó
¤	´	Ä	Ô	ä	ô
¥	µ	Å	Õ	å	õ
	¶	Æ	Ö	æ	ö
§	·	Ç	×	ç	÷
¨	¸	È	Ø	è	ø
©	¹	É	Ù	é	ù
ª	º	Ê	Ú	ê	ú
«	»	Ë	Û	ë	û
¬	$\frac{1}{4}$	Ì	Ü	ì	ü
-	$\frac{1}{2}$	Í	Ý	í	ý
®	$\frac{3}{4}$	Î	Þ	î	þ
¯	¸	Ï	ß	ï	ÿ

15.10 Latin Extended-A

Ā	Ð	Ġ	Ĭ	Ł	Œ	Š	Ů
ā	ð	ġ	ĭ	ł	œ	š	ů
Ă	Ē	Ģ	Ĵ	ł	Œ	Ŧ	Ũ
ă	ē	ģ	ĵ	ŀ	œ	ŧ	ũ
Ą	Ĕ	Ĥ	Ĵ	ń	Ŕ	Ţ	Ű
ą	ĕ	ĥ	ĵ	ņ	ŕ	ţ	ű
Ć	Ė	Ħ	Ų	ŕ	Ŗ	Ŧ	Ŷ
ć	ė	ħ	ų	ŕ	ŗ	ŧ	ŷ
Ĉ	Ė	Ĩ	■	ň	Ř	Ů	Ÿ
ĉ	ĕ	ĥ	■	ň	ř	ů	ž
Č	Ě	Ī	Í	Ň	Š	Ů	ž
č	ě	ī	í	ň	š	ů	ž
Č	Ĝ	Ĭ	Ĵ	Ō	Ŝ	Ů	ž
č	ĝ	ĭ	ĵ	ō	ŝ	ů	ž
Ď	Ĝ	Ĵ	Ĵ	Ŏ	Ş	Ů	ž
ď	ĝ	ĵ	ĵ	ő	ş	ů	ž

15.11 General Punctuation

—	—
‘	’
’	”
“	”
<	>

TeX converts the following pairs and triples to single characters called ligatures

ff fi fl ffi ffl – **ff fi fl ffi ffl** – *ff fi fl ffi ffl*

Kerning is the subtle adjustment of certain pairs of characters.

To, Wo, Ro – **To, Wo, Ro** – *To, Wo, Ro*

16 Type Styles and Kerns

The text in this section tests the available L^AT_EX type styles (plain, bold, italic, and bold italic) for each of the basic fonts (Roman-Times, Sans Serif-Arial, and Typewriter-Courier).

16.1 Type Styles for Roman, Sans Serif, and Typewriter

Roman **bold**, *italic*, and ***bold italic***.

Sans Serif **bold**, *italic*, and ***bold italic***.

Typewriter bold, *italic*, and bold italic.

tiny roman **bold**, *italic*, and ***bold italic***

tiny Sans Serif **bold**, *italic*, and ***bold italic***

tiny Typewriter bold, *italic*, and bold italic

scriptsize roman **bold**, *italic*, and ***bold italic***

scriptsize Sans Serif **bold**, *italic*, and ***bold italic***

scriptsize Typewriter bold, *italic*, and bold italic

footnotesize roman **bold**, *italic*, and ***bold italic***

footnotesize Sans Serif **bold**, *italic*, and ***bold italic***

footnotesize Typewriter bold, *italic*, and bold italic

small roman **bold**, *italic*, and ***bold italic***

small Sans Serif **bold**, *italic*, and ***bold italic***

small Typewriter bold, *italic*, and bold italic

normalsize roman **bold**, *italic*, and ***bold italic***

normalsize Sans Serif **bold**, *italic*, and ***bold italic***

normalsize Typewriter bold, *italic*, and bold italic

large roman **bold**, *italic*, and ***bold italic***

large Sans Serif **bold**, *italic*, and ***bold italic***

large Typewriter bold, *italic*, and bold italic

Large roman **bold**, *italic*, and ***bold italic***

Large Sans Serif **bold**, *italic*, and ***bold italic***

Large Typewriter bold, *italic*, and bold italic

LARGE roman **bold**, *italic*, and ***bold italic***

LARGE Sans Serif **bold**, *italic*, and ***bold italic***

LARGE Typewriter bold, *italic*, and bold italic

huge roman **bold**, *italic*, and ***bold italic***

huge Sans Serif **bold**, *italic*, and **bold italic**
 huge Typewriter **bold**, *italic*, and **bold italic**
 Huge roman **bold**, *italic*, and **bold italic**
 Huge Sans Serif **bold**, *italic*, and **bold italic**
 Huge Typewriter **bold**, *italic*, and **bold italic**

16.1.1 Bold Greek Letters

Here are uppercase and lowercase greek letters, normal and bold, together with nabla, in a variety of positions:

$$x + \gamma + \alpha + \Gamma(\lambda)\Psi^{\beta\delta} + \nabla(\kappa_{\nu\mu}) + \nabla$$

Here is a more comprehensive listing:

$\alpha^{\alpha\alpha}$ $\alpha^{\alpha\alpha}$ $\beta^{\beta\beta}$ $\beta^{\beta\beta}$ $\gamma^{\gamma\gamma}$ $\gamma^{\gamma\gamma}$ $\delta^{\delta\delta}$ $\delta^{\delta\delta}$ $\epsilon^{\epsilon\epsilon}$ $\epsilon^{\epsilon\epsilon}$ $\varepsilon^{\varepsilon\varepsilon}$ $\varepsilon^{\varepsilon\varepsilon}$ $\zeta^{\zeta\zeta}$ $\zeta^{\zeta\zeta}$
 $\eta^{\eta\eta}$ $\eta^{\eta\eta}$ $\theta^{\theta\theta}$ $\theta^{\theta\theta}$ $\vartheta^{\vartheta\vartheta}$ $\vartheta^{\vartheta\vartheta}$ $\iota^{\iota\iota}$ $\iota^{\iota\iota}$ $\kappa^{\kappa\kappa}$ $\kappa^{\kappa\kappa}$ $\lambda^{\lambda\lambda}$ $\lambda^{\lambda\lambda}$ $\mu^{\mu\mu}$ $\mu^{\mu\mu}$

Here are superscript greek letters, normal and bold, following normal and bold numbers:

$1^{\alpha\alpha}$ $1^{\alpha\alpha}$ $1^{\beta\beta}$ $1^{\beta\beta}$ $1^{\gamma\gamma}$ $1^{\gamma\gamma}$ $1^{\delta\delta}$ $1^{\delta\delta}$ $1^{\epsilon\epsilon}$ $1^{\epsilon\epsilon}$ $1^{\varepsilon\varepsilon}$ $1^{\varepsilon\varepsilon}$ $1^{\zeta\zeta}$ $1^{\zeta\zeta}$
 $1^{\eta\eta}$ $1^{\eta\eta}$ $1^{\theta\theta}$ $1^{\theta\theta}$ $1^{\vartheta\vartheta}$ $1^{\vartheta\vartheta}$ $1^{\iota\iota}$ $1^{\iota\iota}$ $1^{\kappa\kappa}$ $1^{\kappa\kappa}$ $1^{\lambda\lambda}$ $1^{\lambda\lambda}$ $1^{\mu\mu}$ $1^{\mu\mu}$

Here are subscript greek letters, normal and bold, following normal and bold numbers:

$1_{\alpha\alpha}$ $1_{\alpha\alpha}$ $1_{\beta\beta}$ $1_{\beta\beta}$ $1_{\gamma\gamma}$ $1_{\gamma\gamma}$ $1_{\delta\delta}$ $1_{\delta\delta}$ $1_{\epsilon\epsilon}$ $1_{\epsilon\epsilon}$ $1_{\varepsilon\varepsilon}$ $1_{\varepsilon\varepsilon}$ $1_{\zeta\zeta}$ $1_{\zeta\zeta}$
 $1_{\eta\eta}$ $1_{\eta\eta}$ $1_{\theta\theta}$ $1_{\theta\theta}$ $1_{\vartheta\vartheta}$ $1_{\vartheta\vartheta}$ $1_{\iota\iota}$ $1_{\iota\iota}$ $1_{\kappa\kappa}$ $1_{\kappa\kappa}$ $1_{\lambda\lambda}$ $1_{\lambda\lambda}$ $1_{\mu\mu}$ $1_{\mu\mu}$

17 Font Size Commands

The L^AT_EX font size switches are not directly supported by SW. This is deliberate, because we attempt to create objects that encapsulate such switches. A switch “in the clear” causes the filter to turn that switch on and off for every paragraph. Thus, all such switches should be encapsulated like this: `{\huge huge text}`. We strongly discourage the use of such switches. Instead, you should create appropriate tags in a style, giving the size changes content-oriented meaning. The following table is included here to check the font sizes and shapes provided by the style.

LaTeX Command	Style Editor Size	Example
<code>\tiny</code>	tiny	Gnu
<code>\scriptsize</code>	script	Gnu
<code>\footnotesize</code>	footnote	Gnu
<code>\small</code>	small	Gnu
<code>\normal</code>	normal	Gnu
<code>\large</code>	large-1	Gnu
<code>\Large</code>	large-2	Gnu
<code>\LARGE</code>	large-3	Gnu
<code>\huge</code>	large-4	Gnu
<code>\Huge</code>	large-5	Gnu

18 Spacing Objects

18.1 Horizontal

Each horizontal spacing object is placed between reversed brackets, where this makes sense.

Required space] [
 Non-breaking space] [
 Em space (quad)] [
 2-Em space (double quad)] [
 Thin space] [
 Thick space] [
 Italic correction][
 Negative thin space][
 Zero space][
 No indent
 Custom space (1 inch)] [
 Custom space (stretchy, 1.0)] [
 Custom spaces (stretchy, 1.0, 0.5)] [
 Custom space (stretchy, line)] [
 Custom space (stretchy, dots)] [

18.2 Vertical

Small skip:

Medium skip:

Big skip:

Strut []

Math strut $\sqrt{\quad}$ Radical without math strut $\sqrt{\quad}$

Custom (1 inch):

18.3 Rule



Rule, raised 0.25 inch, 1 inch wide, .25 inch high

18.4 Breaks

Allowbreak][
Discretionary hyphen][
No break][
Page break][

New page]

```
[
Line                                     break
]
[
New line ]
[
Custom new line, 1 inch]
```

```
[
```

19 Verb and Verbatim

The L^AT_EX `\verb` command is available as a fragment. You enter the fragment, then choose Edit Properties to change the contents. A `\verb: ‘~!@#$%^&*()_+|\{}`

The L^AT_EX verbatim environment is translated to the Body Verbatim paragraph environment in *Scientific Word*. This environment is valuable for displaying fragments of program code:

```
\long\def\@caption#1[#2]#3{%
\par
%\edef\@tempa{\csname #1TOCLabel\endcsname}
\AddContentsLine
{\csname ext@#1\endcsname}%
{#1@toc}%
{\csname #1toclabel\endcsname}%
{\ignorespaces #2}%
\begingroup
\@parboxrestore
\normalsize
\csname @makecaption#1\endcsname{\ignorespaces #3}\par
\endgroup}
```

Active L^AT_EX characters can cause problems in verbatim translations:

```
‘~!@#$%^&*()_-=[]\|;:’",<.>/?
```

Another approach to program code is illustrated by the following, which uses a table.

```

for  $j := 2$  step 1 until  $n$  do
  begin  $accum := A[j]$ ;  $k := j - 1$ ;  $A[0] := accum$ ;
  while  $A[k] > accum$  do
    begin  $A[k + 1] := A[k]$ ;  $k := k - 1$ ;
    end;
   $A[k + 1] := accum$ ;
end.

```

20 Comments

You enter L^AT_EX comments using the comment fragment. Enter the fragment, then choose Edit Properties to change the body of the comment.

21 Tables and Arrays

21.1 Tables

There are many different tables that you can create with the table editor. Some are included here to test

Ethnicity	1986	1987	1988	1989	1990	% Change 1986-1990
Amer. Indian	294	277	298	328	361	23.0%
Black	192	206	199	183	225	17.0%
Hispanic	3,108	3,131	3,433	3,637	4,038	30.0%
Oriental	67	65	71	77	96	30.0%
Other	10,057	10,324	10,283	10,075	10,089	0.3%

Course	1987	1988	1989	1990	1991
MATH 280	68	61	58	61	84
MATH 480	36	26	41	44	53

21.1.1 From the L^AT_EX User's Guide and Reference Manual

gnats	gram	\$13.65
	each	.01
gnu	stuffed	92.50
emur		33.33
armadillo	frozen	8.99

<i>type</i>	<i>style</i>	
smart	red	short
rather silly	puce	tall

21.1.2 From Jane Hahn's L^AT_EX for Everyone

Overall Heading of Table			
Left-justified	Right-justified	Centered	Right-justified
one	two	three	four
1	2	3	4
i	ii	iii	iv

Household Budget	
Item	% of Budget
Housing	50.0
Food	25.0
Toys	10.5
Pet Supplies	7.5
Clothes	5.25
Charity	1.75

PORTABLE HOOK-ON CHAIRS		
BRAND	Graco	Strolee
MODEL	Tot Loc Chair	Meal Mate
PRICE	\$23	\$32
OVERALL JUDGEMENT	Satisfactory	Satisfactory
WEIGHT	7 lb. 9 oz.	6 lb. 8 oz.

THE CATECHISM	
Q.	What are we by nature?
A.	We are part of God's creation, made in the image of God.
Q.	What does it mean to be created in the image of God?
A.	It means that we are free to make choices: to love; to create, to reason, and to live in harmony with creation and with God.
Q.	Why then do we live apart from God and out of harmony with creation?
A.	From the beginning, human beings have misused their freedom and made wrong choices.

21.1.3 The Economist

Here is a table that is too wide for the page:

	Feb 22nd	1993/94		% change on				
		high	low	one week	one year	record high	Dec 31st 1992 in local currency	1992 in \$ terms
Australia	2,202.5	2,340.6	1,495.0	− 1.4	+ 36.9	− 5.9	+42.1	+48.6
Austria	450.7	460.7	300.3	+ 0.1	+ 29.8	−35.9	+44.0	+35.0
Belgium	1,504.5	1,542.7	1,125.5	− 1.2	+ 24.3	− 2.5	+33.5	+24.8
Britain	3,333.7	3,520.3	2,737.6	− 1.8	+ 18.3	− 5.3	+17.1	+14.4
Canada	4,371.1	4,591.3	3,275.8	− 1.0	+ 26.6	− 4.8	+30.5	+23.5
Denmark	407.4	415.8	261.9	+ 0.3	+ 44.4	− 2.0	+55.7	+45.0
France *	1,506.6	1,585.2	1,114.2	− 1.0	+ 23.1	− 5.0	+32.1	+24.4
Germany	2,107.6	2,268.0	1,516.5	− 0.4	+ 26.8	− 7.1	+36.4	+27.9
Holland	285.6	294.8	198.6	− 1.4	+ 35.7	− 3.1	+44.2	+35.4
Italy	672.2	689.0	446.3	− 0.6	+ 33.7	−26.0	+50.6	+32.0
Japan	19,342.6	21,148.1	16,078.7	+ 1.9	+ 14.7	−50.3	+14.3	+35.3
Spain	339.6	358.3	215.6	− 2.0	+ 49.0	− 5.2	+58.5	+29.2
Sweden	1,565.8	1,603.9	879.1	+ 2.1	+ 58.5	− 2.4	+71.6	+53.0
Switzerland	2,982.8	3,178.4	2,049.5	− 0.3	+ 45.5	− 6.2	+41.6	+43.1
United States	3,911.7	3,978.4	3,242.0	− 0.4	+ 17.7	− 1.7	+18.5	+18.5
World †	621.2	641.0	488.6	− 0.7	+ 23.1	− 3.1	+25.0	+25.0

22 Matrices

Matrices have similar behavior to tables, but are in math mode.

Inline matrix: $\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}}$. Generally, these are hard to read without surrounding fences, like $\left(\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \right)$ or $\left[\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \right]$.

Displayed matrix:

$$\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \text{ or } \left(\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \right) \text{ or } \left[\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \right]$$

Try various column alignment options: left $\frac{1}{4} + \frac{1}{4} \frac{\frac{1}{4}}{\frac{1}{3}} + \frac{1}{4}$, center $\frac{1}{4} + \frac{1}{4} \frac{\frac{1}{4}}{\frac{1}{3}} + \frac{1}{4}$, right $\frac{1}{4} + \frac{1}{4} \frac{\frac{1}{4}}{\frac{1}{3}} + \frac{1}{4}$.

Try various baseline alignment options: top row $\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}}$, center $\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}}$, bot-

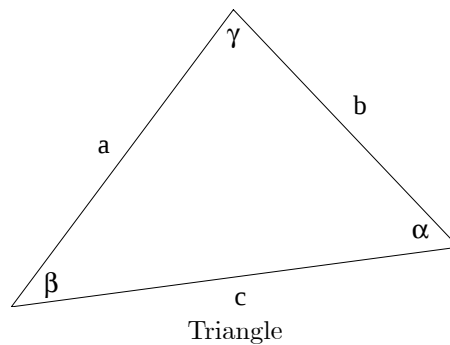
tom row $\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}}$.

Finally, you can use built-in delimiters which may look better in certain situations. brackets $\left[\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \right]$ vs. $\left[\frac{1}{2} \frac{\frac{1}{2}}{\frac{1}{3}} \right]$ (standard matrix with fence – the screen

appearance is the same in SWP). braces $\left\{ \begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right\}$ vs. $\left\{ \begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right\}$. vertical bar
 $\left| \begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right|$ vs. $\left| \begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right|$. double vertical bar $\left\| \begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right\|$ vs. $\left\| \begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right\|$. parentheses
 $\left(\begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right)$ vs. $\left(\begin{array}{c} 1 \\ \frac{1}{2} \end{array} \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \end{array} \right)$.

23 Graphics

Here is a displayed graphic.



Displayed graphic.



In-line graphic in a centered paragraph.



Various inline graphics. On baseline , raised , lowered ,



Butterfly

with caption , without frame , frame only , iconified , us-

ing the default .

Different graphic types:



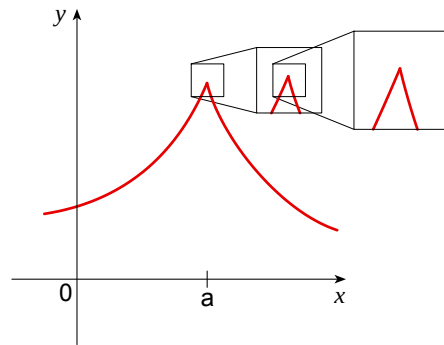
Figure 1: This is the caption text. It's below. It also contains a marker ()



Figure 2: This is the caption text. It's below. It also contains a marker ()



AI:



Here is a floating graphic.
 Reference to fig:key1 (1) and to fig:key2 (1)
 Here is a floating graphic with very long keys.
 References to (2) and to (2)

24 Standard L^AT_EX Float Environments

The standard L^AT_EX float environments are figure and table. These are not directly supported by the SW/SWP input and output filters. However, these



Figure 3: This is the caption text. It is a long caption so that we can observe line wrap in this case of a long long long caption longer than the line width.



Figure 4: This is a caption containing mathematics. $\int_{\alpha}^{\beta} \ln u du$

environments are preserved, and you can edit their contents using Edit Properties. All label statements are also visible in SW/SWP for cross-references.

Figure 5: Caption First

... figure body ...
... figure body ...

Figure 6: Caption Second

Table 1: Caption First

... table body ...
... table body ...

Table 2: Caption Second

25 Scientific Notebook Items

These constructs were introduced with the first version of Scientific Notebook. They are now available in SW/SWP. They are provided here to test the ability of SW/SWP to create a document containing these constructs that can also be compiled with L^AT_EX.

25.1 Hypertext Links

Hypertext link with text: ??

Hypertext link with graphic: ??

Hypertext links can go to external documents specified by a URI as show above, or to markers or Hypertext targets, as illustrated here: 25.2

25.2 Hypertext Targets

Hypertext target at the end of this sentence. These become visible by turning on markers.

25.3 Formulas

Formulas allow you to create elements which are recalculated every time they are displayed on screen. If the expression uses defined quantities, then the formula will change every time you redefine the quantity.

Formula: $\frac{1}{3}ax^3$

Now, define $a = \pi$ and see what happens.

25.4 Units

Base SI Units

<i>Physical quantity</i>	<i>Symbol</i>
length	m
mass	kg
time	s
electric current	A
thermodynamic temperature	K
amount of substance	mol
luminous intensity	cd

Supplementary SI Units

<i>Physical quantity</i>	<i>Name</i>	<i>Symbol</i>
plane angle	radian	rad
solid angle	steradian	sr

Derived SI Units with Special Names

<i>Physical quantity</i>	<i>Symbol</i>
frequency	Hz
energy	J
force	N
power	W
pressure	Pa
electric charge	C
electric potential difference	V
electric resistance	Ω
electric conductance	S
electric capacitance	F
magnetic flux	Wb
inductance	H
magnetic flux density	T
luminous flux	lm
illumination	lx

The following examples use Unicode characters.

MicroFarad: μF

Degree Celcius: $^{\circ}\text{C}$

Angular Measure: $30^{\circ}10'12''$

Ohm: Ω

25.5 New Note Types

Margin Hint with icon:

Margin Hint with text:

Margin Hint with picture:

Solution Note with icon:

Solution Note with text:

Solution Note with picture:

Problem Solving Hint with icon:

Problem Solving Hint with text:

Problem Solving Hint with picture:

Note with icon:

Note with text:

Note with picture:

Answer Note with icon: .

Answer Note with text: .

Answer Note with picture: .

Here is a note containing a picture: .

Margin Hint

Margin Hint

Margin Hint

Solution Note

Solution Note

Solution Note

Problem Solving Hint

Problem Solving Hint

Problem Solving Hint

Note

Note

Note

Answer Note

Answer Note

Answer Note

This answer note contains a picture:



25.6 HTML Fields

These are analogous to TeX Fields, but are active when you Export to HTML.

26 Conclusion

We are now done with our sample article.

The following references automatically generate a References section heading.

References

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