A Sample Article

Dr. Tane Hunter
TCI Software Research

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Abstract

This article illustrates many features of a mathematics document created with Scienti...c Word or Scienti...c WorkPlace.

Contents

List of Figures

1 A Sample Article

This document contains a wide range of symbols and constructs. It illustrates the many possibilities available to you. The document is set up to compile with all installation choices. In particular, it does not include any characters from the Latin 1 and Extended Latin 1 character sets, so it will compile correctly with the English-only version of the installation.

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 $n \,!\, 1$, $a_{n;k} \,!\, 0$ for each k, and $°_n = \sum_{k=0}^{1} (a_{n;k+1} \, i \, a_{n;k})^+ \,!\, 0$ Then for each x in C, $A_n x = \sum_{k=0}^{1} a_{n;k} T^k x$ converges weakly to a ...xed 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

$$u_{tt} \, i \, ¢u + u^5 + u\,j u j^{p\,i\,2} = 0 \text{ in } R^3 \, £ \, [0; 1\,[: \qquad (1)$$

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 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.

3

Short above

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

short below.

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

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

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

Scienti...c Word and WorkPlace provide a range of alignment options for multi-line mathematical displays. Here is a series of multiline displays.

$$x = 17y \tag{1}$$
$$y > a + b + c + d + e + f + g + h + i + j +$$
$$k + l + m + n + o + p \tag{2}$$

$$x \ \text{¿} \ y_1 + \text{₵₵₵} + y_n$$
$$\cdot \ z$$

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

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

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

$$f([x + 1]=[x + 2]) = f[x + 1]=[x + 2]g + 1 = (2x + 3)=(x + 2)$$

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

$$\max(f; g) = \frac{f + g + jf \text{ ¡ } gj}{2}, \tag{3}$$
$$\max(f; \text{ ¡ } g) = \frac{f \text{ ¡ } g + jf + gj}{2}. \tag{4}$$

4

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

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

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

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

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

$$x \quad = \quad a+b \qquad (8a)$$
$$y \quad = \quad c+d \qquad (8b)$$
$$z \quad = \quad e+f \qquad (8c)$$

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

$$u \quad = \quad g+h \qquad (8d)$$
$$v \quad = \quad i+j \qquad (8e)$$
$$w \quad = \quad k+l \qquad (8f)$$

Test the overriding of automatic equation labels:

$$x \quad = \quad y+z \qquad (A\text{--}1)$$
$$= \quad k+m \qquad (A\text{--}2)$$

Test the overriding of automatic equation labels, suppressing annotation:

$$x \quad = \quad y+z \qquad A\text{--}1$$
$$= \quad k+m \qquad A\text{--}2$$

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

There is a signi...cant di¤erence between the standard LATEX equation array and the AMS align environment. SW/SWP does not show this di¤erence on screen. To check this di¤erence, look at the Typeset Preview versions of the following.

$$x \quad = \quad y$$
$$= \quad z$$

5

$$x = y$$
$$= z$$

The space around the = sign in the ...rst set of equations (the 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 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 $\int_{\circledR}^{R} \ln t \, dt$

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 proclamations[1]. This is a marginal marginal note. These theorem-like environments are available.

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.

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.

---

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

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 di¤erence between an in-line sum $\sum_{n=1}^{\infty} \frac{1}{n^2}$ and a displayed sum

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

Corollary 9 This is a corollary

Criterion 10 This is a criterion

De...nition 11 This is a de...nition

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 $u_0 \in C^3\left(R^3\right); u_1 \in C^2\left(R^3\right)$ have ...nite energy

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

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.

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

SW/SWP provides no direct user access to the \section* command. However, the input and output ...lters should preserve these constructs. 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.

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, level 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, level 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 ...ve 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, ...rst paragraph.

   Level 1, second paragraph.

   (a) Level 2, ...rst paragraph.

       Level 2, second paragraph.

       i. Level 3, ...rst paragraph.
          Level 3, second paragraph.

          A. Level 4, ...rst paragraph.
             Level 4, second paragraph.

5.2.2 Bulleted Lists

² Bullet item, level 1.

  – Bullet item, level 2.

    ¤ Bullet item, level 3.

      ¢ Bullet item, level 4.

² 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 ...rst item under the third item

elgnairT: First item under the ...rst item under the ...rst item under the third item

elgnairT: Second item under the ...rst item under the ...rst item under the third item
Continuation paragraph under the second item under the ...rst 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 $\int \sin x\, dx$

ABC Lead-in is ABC

$\frac{p}{3}$ 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 footnote[2]

2. A margin note

   (a) A footnote with lists. [3]

   (b) A margin note with lists.

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

---

[2] This footnote is in a list item
[3] A list in a footnote:
 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 coℂn! No news of them? Why, thou loss upon loss! The thief gone with so much, and so much to ...nd 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 oℂcer; 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.[4][5][6][7]

The ...rst 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.

This section discusses the di¤erences between some aspects of the LATEX coding SW uses in LATEX2.09 and LATEX2e documents. In LATEX2.09, the commands for what we call tagged runs, including boldface, italics, and emphasis, are switches. In LATEX2e, the switch commands are still available, but use

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[4] The ...rst in a series of consecutive footnotes.
[5] The second in a series of consecutive footnotes.
[6] The third in a series of consecutive footnotes.
[7] The fourth in a series of consecutive footnotes.

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	LaTeX2.09	LaTeX2e	Example
Italic	{nit text}	ntextit{text}	text
Bold	{nbf text}	ntextbf{text}	text
Small Caps	{nsc text}	ntextsc{text}	text
Sans Serif	{nsf text}	ntextsf{text}	text
Slant	{nsl text}	ntextsl{text}	text
Typewriter	{ntt text}	ntexttt{text}	text
Emphasis	{nem text}	{nem text}	text
Roman	{nrm text}	ntextrm{text}	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 enviroment that forces math. Within that environment (here, a pair of empty expanding brackets), we select text in addition to the tagged run.

Name	LaTeX2.09	LaTeX2e	Example
Italic	$ntext{nit text}$	$ntextit{text}$	text
Bold	$ntext{nbf text}$	$ntextbf{text}$	text
Small Caps	$ntext{nsc text}$	$ntextsc{text}$	text
Sans Serif	$ntext{nsf text}$	$ntextsf{text}$	text
Slant	$ntext{nsl text}$	$ntextsl{text}$	text
Typewriter	$ntext{ntt text}$	$ntexttt{text}$	text
Emphasis	$ntext{nem text}$	${nem text}$	text
Roman	$ntext{nrm text}$	$ntextrm{text}$	text

The coding of the above tagged runs presents a number of problems for the ...lter. There is now an option to use ntextrm or nmbox in place of the ntext command.

Name	LaTeX2.09	LaTeX2e	Example
Italic	{nit text}	ntextit{text}	text
Bold	{nbf text}	ntextbf{text}	text
Small Caps	{nsc text}	ntextsc{text}	text
Sans Serif	{nsf text}	ntextsf{text}	text
Slant	{nsl text}	ntextsl{text}	text
Typewriter	{ntt text}	ntexttt{text}	text
Emphasis	NA	NA	NA
Roman	{nrm text}	ntextrm{text}	text

Small Caps Here!
This sentence is slanted.
This is math [x + italic + y + sansserif + **bold** + roman + CALLIGRAPHIC]
Here is a display

$$x + text + y + roman + roman\ text$$

and then we ...nish o¤ the paragraph with great alacrity.
Now we use italics. Here is a display

$$x + text + y + roman + roman\ text$$

and then we ...nish o¤ the paragraph with great alacrity.
This is a paragraph of italic text with a stretch of roman in the middle.
You obtain nmathrm by applying roman to a selection in math, and you obtain ntextrm by applying text and then applying roman. [x + roman + textroman]

7.3 Fraktur and Blackboard Bold

fraktur
BLACKBOARDBOLD

8 The ntext Command

SW writes text in mathematics using the AMS ntext command. This is the only command for text in mathematics that reduces size appropriately when smaller fonts are called for in LATEX2.09. The nrm switch also works in LATEX2e. Here is text in mathematics at various sizes:

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

and the same, attempted with nrm:

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

and with nmbox:

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

8.1 Operators

The following is a list of operators from the **Insert, Operator**... menu selection.

R	RR	RRR	RRRR	R	R	H	P	Q	T
V	L	J	F	~ ¢¢¢		S	W	N	U

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."

Z $_a$	**ZZ** $_b$	**ZZZ**	**ZZZZ**	**Z Z**
		dV	dT	¢¢¢ d¢¢¢
			?	:::
Δ	**M** $^A_{100}$	**K** ¢	**G**	**a** A small paragraph
$_i$ x_i	X_i	°6v ^{a} °	O ^{1} »	¥$_i$
			»=@ 1 2 **A**	
			3 4	

I	**X** $_5$	**Y** $_7$	**＼**
d°	$x=1$ $\frac{1}{x^2}$	$x=5$ (1 ¡ **p** $\overline{x}$)	A2A **A**
[$_i$	**—**	**O**	**]** Joe
x^{x^x} **U**$_x$	**R**$_i$ y^i	¹2f1;2;5;7g © 1	Blow **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."

R $_a$	**RR**	**RRR**	**RRRR**	**R R**
V xdx	**L** $\frac{dxdy}{xy}$	**J** ¢ dV	**F** ? dT	` ¢¢¢ ::: d¢¢¢
	$^A_{100}$			A small paragraph ¥$_i$
$_i$ x_i	X_i	°6v ^{a} °	O ^{1} »	
			»=@ 1 2 **A**	
			3 4	

H	**P** $_5$	**Q** $_7$	**T**
S d°	**W** $x=1$ $\frac{1}{x^2}$	**N** $x=5$ (1 ¡ **p** $\overline{x}$)	**U** A2A **A**
x^{x^x} **U**$_x$	**R**$_i$ y^i	¹2f1;2;5;7g © 1	Joe Blow **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."

Z ^{a}	**ZZ**	**ZZZ**	**ZZZZ**	**Z Z**
xdx	$\frac{dxdy}{xy}$	dV	dT	¢¢¢ d¢¢¢
$_b$	A	¢	?	:::
∧ x_i	**M** $^A_{100}$ X_i	**K** ^{a} °	**G**	A small paragraph **a** ¥$_i$
$_i$		°6v	O ^{1} »	
			»=@ 1 2 **A**	
			3 4	

I	**X** $_5$	**Y** $_7$	**＼**
d°	$\frac{1}{x^2}$	(1 ¡ **p** $\overline{x}$)	A
$_i$	$x=1$	$x=5$	A2A
[**U**$_x$	**—** y^i	**O** © 1	Joe **B**
x^{x^x}	**R**$_i$	¹2f1;2;5;7g	Blow

8.1.1   Multi-Line Subscripts and Superscripts

$$\mathbf{P}_{\substack{1<i<10 \\ 1<j<10}} 2^{i+j} \text{ is more reasonable than } {}_{\substack{7 \\ 56 \\ 4 \\ 12^3 \\ i\ 1 \\ 2_3 \\ 4 \\ 5_6 \\ 7}}$$

8.2 Brackets

The following is a list of the di¤erent brackets from the **Insert, Brackets**... menu selection.

$\frac{a}{\frac{x}{y}}$	$\frac{¥}{X}$	$\pm \frac{1}{J} \pm$	$\tilde{W}\frac{m}{m}\tilde{W}$	gUf
$\frac{b}{\frac{x}{y}}$	$\frac{§}{X}$	$2\frac{1}{L}2$	$\frac{n}{n}$	]V[
$\frac{c}{\frac{x}{y}}$	$\frac{G}{X}$	$\dot{y}\frac{1}{L}\dot{y}$	$\tilde{W}\frac{o}{o}\tilde{W}$	)W(
$\frac{d}{\frac{x}{y}}$	$\frac{H}{X}$	$\frac{L}{X}$	$\dot{y}\frac{p}{p}\dot{y}$	

8.3 Binomials

The following is a list of operators from the **Insert, Binomials**... menu selection.

$\tilde{A}\tilde{A}$	XX	$\sim\sim$	??	ww	¨§	!¥	®.	ªc	¤f	$\dot{y}\dot{y}$	

8.4 Decorations

The following is a list of decorations from the **Insert, Decorations**... menu selection.

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

8.5 The Symbols

Here are the symbols on the panels.

8.5.1 Lowercase Greek

®	¯	°	±
2	"	3	´
µ	#	¶	·
¸	1	º	»
¼	$	½	¾
&	¿	À	Á
'	Â	Ã	!
{	%		

8.5.2 Uppercase Greek

¡	¢
£	¤
¥	¦
§	¨
©	ª
–	z

8.5.3 Binary Operations

§	¨	n	¢	£
*	?	¦	±	2
¥	C	_	^	©
a	–	®	\	[
]	u	t	/	.
0	°	4	5	B
¯	y	z	q	E
D	i	¢	£	¯
Y	Z	[	d	e
f	g	h	i	u
|	}	~	Ä	>

18

8.5.4 Binary Relations

·	Á	¹	¿	½	µ	@
∨	2	`	∧	´		»
'	³	¼	̦	Ā	°	À
¾	¶	A	w	3	a	j̣
k	?	≩	./	/	j=	≐
ʠ	°	±	²	$	%	&
'	)	*	+	,	4	.
∕	0	1	2	3	4	5
6	7	:	;	<	=	>
?	B	C	D	E	F	G
H	I	J	M	P	Q	R
S	T	_	`	a	b	c
j	k	l	m	n	o	t
v	w	h	l	m	ᵽ	q
s	t	u	v	w		

8.5.5 Negated Relations

6	2	¡	¢	£
¤	¥	¦	§	¨
©	ª	¬	®	¯
°	±	²	³	´
µ	¶	·	̦	¹
º	»	¼	½	¾
¿	À	Ã	!	"
#	$	%	&	'
(	)	*	+	,
-	.	/	0	1
2	3	4	5	7
6	8	9	:	;
<	=	@		

8.5.6 Arrows

Ã	(	!	)	$
ʹ	ɤ	Ã-	(	)
-	"	*	#	+
l	Ãi	(=	¡ !	=)
Ã!	( )	ɟ!	!	*
+	Ã	m	%	&
.	-	©	ª	-
®	ƺ	´	µ	¶
.		¹	º	»
¼	½	¾	¿	À
Á	Â	Ã	!	"
#	(	V	W	×
y	99K	L99	

8.5.7 Miscellaneous

. . .	¢¢¢	⋮	⋱	s
@	~	¬	±	`
}	<	=	@	1
¤	8	9	[	þ
f	′	;	r	
>	?	k	\	4
§	]	|	}	~
Ä	¤	¥	¨	8
N	O	]	^	s
{	?	i	j	k
}	Á	Â	`	a
|	Ä	X	z	

8.5.8 Delimiters

b	c
d	e
h	i
p	x
q	y

8.5.9 ASCII

	0	@	P	'	p
!	1	A	Q	a	q
"	2	B	R	b	r
#	3	C	S	c	s
$	4	D	T	d	t
%	5	E	U	e	u
&	6	F	V	f	v
'	7	G	W	g	w
(	8	H	X	h	x
)	9	I	Y	i	y
¤	:	J	Z	j	z
+	;	K	[	k	{
,	<	L	\	l	ǀ
-	=	M	]	m	}
.	>	N	^	n	~
/	?	O	_	o	

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

¤ ... ‡ ¢ –

Kerning is the subtle adjustment of certain pairs of characters.

To, Wo, Ro

9 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). We also check small caps and the available kerns.

9.1 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

9.1.1 Bold Greek Letters

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

$$x + ° + ® + ¡ (˛)^{a} {}^{-±} + r (· ∘₁) + r$$

Here is a more comprehensive listing:

®®® ®®®   – ˉ˜ – ˉ˜   ∘ ∘° ∘ ∘°   ±±± ±±±   2²² 2²²   "" "" "" ""   3³³ 3³³

˙´ˇ ˙´ˇ   μμᵘ μμᵘ   #ᶠ# #ᶠ#   ¶¶ᵐ ¶¶ᵐ   · · ˙· · ˙   ˛˚ ˛˚   1¹¹ 1¹¹

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

$1^{®®}1®^{®®}$ $1^{¯¯}1^{¯¯}$ $1^{°°}1^{°°}$ $1^{±±}1^{±±}$ $1^{22}1^{22}$ $1^{""}1^{""}$ $1^{33}1^{33}$

$1^{´´}1^{´´}$ $1^{μμ}1^{μμ}$ $1^{\#\#}1^{\#\#}$ $1^{¶¶}1^{¶¶}$ $1^{··}1^{··}$ $1^{·´}1^{·´}$ $1^{''}1^{''}$

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

$1_{®®}1_{®®}$ $1_{--}1_{--}$ $1_{°°}1_{°°}$ $1_{±±}1_{±±}$ $1_{22}1_{22}$ $1_{""}1_{""}$ $1_{33}1_{33}$

$1_{··}1_{··}$ $1_{μμ}1_{μμ}$ $1_{\#\#}1_{\#\#}$ $1_{±±}1_{±±}$ $1_{··}1_{··}$ $1_{°°}1_{°°}$ $1_{,,}1_{,,}$

10 Font Size Commands

The LaTeX 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 ...lter to turn that switch on and o¤ for every paragraph. Thus, all such switches should be encapsulated like this: {nhuge 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
ntiny	tiny	Gnu
nscriptsize	script	Gnu
nfootnotesize	footnote	Gnu
nsmall	small	Gnu
nnormal	normal	Gnu
nlarge	large-1	Gnu
nLarge	large-2	Gnu
nLARGE	large-3	Gnu
nhuge	large-4	Gnu
nHuge	large-5	Gnu

11 Spacing Objects

11.1 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)] . . . .[

11.2   Vertical

Small skip:

    Medium skip:

    Big skip:

    Strut []
    Math strut $\sqrt{}$ Radical without math strut $\sqrt{}$
    Custom (1 inch):

11.3   Rule

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

11.4   Breaks

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

New page]

[
Line   break   ]
[

New line]
[

Custom new line, 1 inch]

[

12   Verb and Verbatim

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

The LATEX verbatim environment is translated to the Body Verbatim paragraph enviroment in Scienti...c 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 LATEX 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.
```

13 Comments

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

14 Tables and Arrays

14.1 Tables

There are many di¤erent 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

14.1.1 From the LATEX User's Guide and Reference Manual

gnats	gram	$13.65
	each	.01
gnu	stu¤ed	92.50
emur		33.33
armadillo	frozen	8.99

type	style	
smart	red	short
rather silly	puce	tall

14.1.2 From Jane Hahn's LATEX for Everyone

Overall Heading of Table			
Left-justi...ed	Right-justi...ed	Centered	Right-justi...ed
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. |

14.1.3 The Economist

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

	Feb 22nd	1993/94 high	low	one week	one year	record high	Dec 31st in local currency	1992 in $ terms
						% change on		
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 y	621.2	641.0	488.6	− 0.7	+ 23.1	− 3.1	+25.0	+25.0

15   Graphics

Here is a displayed graphic.

Triangle
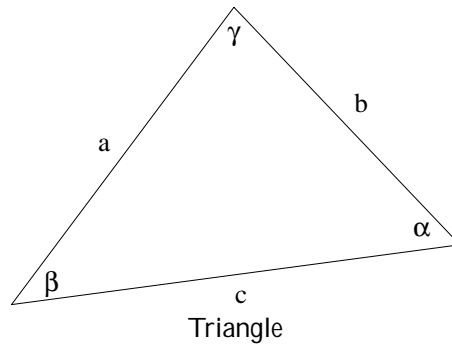
Displayed graphic.

In-line graphic in a centered paragraph.

Figure 1: This is the caption text. It's below. It also contains a marker ()
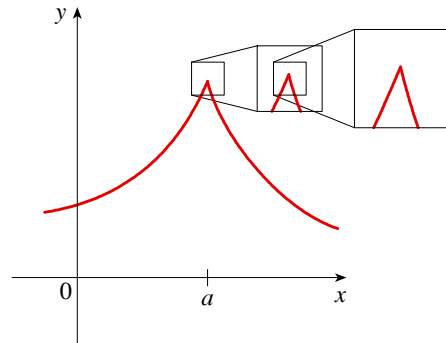
Various inline graphics. On baseline , raised , lowered , with caption , without frame , frame only , iconi...ed , using the default .

Butter‡y

Di¤erent graphic types:

WMF : $\alpha \; \beta \; \gamma \; \delta$ GIF: JPEG:

AI:

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

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

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.

16   Standard LATEX Float Environments

The standard LATEX ‡oat environments are ...gure and table. These are not directly supported by the SW/SWP input and output ...lters. However, these environments are preserved, and you can edit their contents using Edit Properties. All label statements are also visible in SW/SWP for cross-references.

17   Scienti...c Notebook Items

These constructs were introduced with the ...rst version of Scienti...c 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 LATEX.

17.1   Hypertext Links

Hypertext link with text: [Left text](??)[Right text]
   Hypertext link with icon: [Left text](??)[Right text]
   Hypertext link with graphic: [Left text](??)[Right text]

17.2   External Program Calls

External program call to the Solitaire program with text:
   External program call to the Solitaire program with icon:
   External program call to the Solitaire program with graphic:

Figure 4: This is a caption containing mathematics. $^{R}_{®}$ ln udu

Figure 5: Caption First

. . . ...gure body . . .
. . . ...gure body . . .

Figure 6: Caption Second

Table 1: Caption First

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

Table 2: Caption Second

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

17.3   Units

Base SI Units

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

Supplementary SI Units

Physical quantity	Name	Symbol
plane angle	radian	rad
solid angle	steradian	sr

Derived SI Units with Special Names

Physical quantity	Symbol
frequency	Hz
energy	J
force	N
power	W
pressure	Pa
electric charge	C
electric potential di¤erence	V
electric resistance	–
electric conductance	S
electric capacitance	F
magnetic ‡ux	Wb
inductance	H
magnetic ‡ux density	T
luminous ‡ux	lm
illumination	lx

The following examples use Unicode characters.

MicroFarad: ¹F

Degree Celcius: ±C

Angular Measure: $30\pm 10^{0} 12^{00}$

Ohm: –

17.4   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: .

    The following references automatically generate a References section heading.

<div style="float:right">

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:

</div>

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