

# How to do stuff in LaTeX

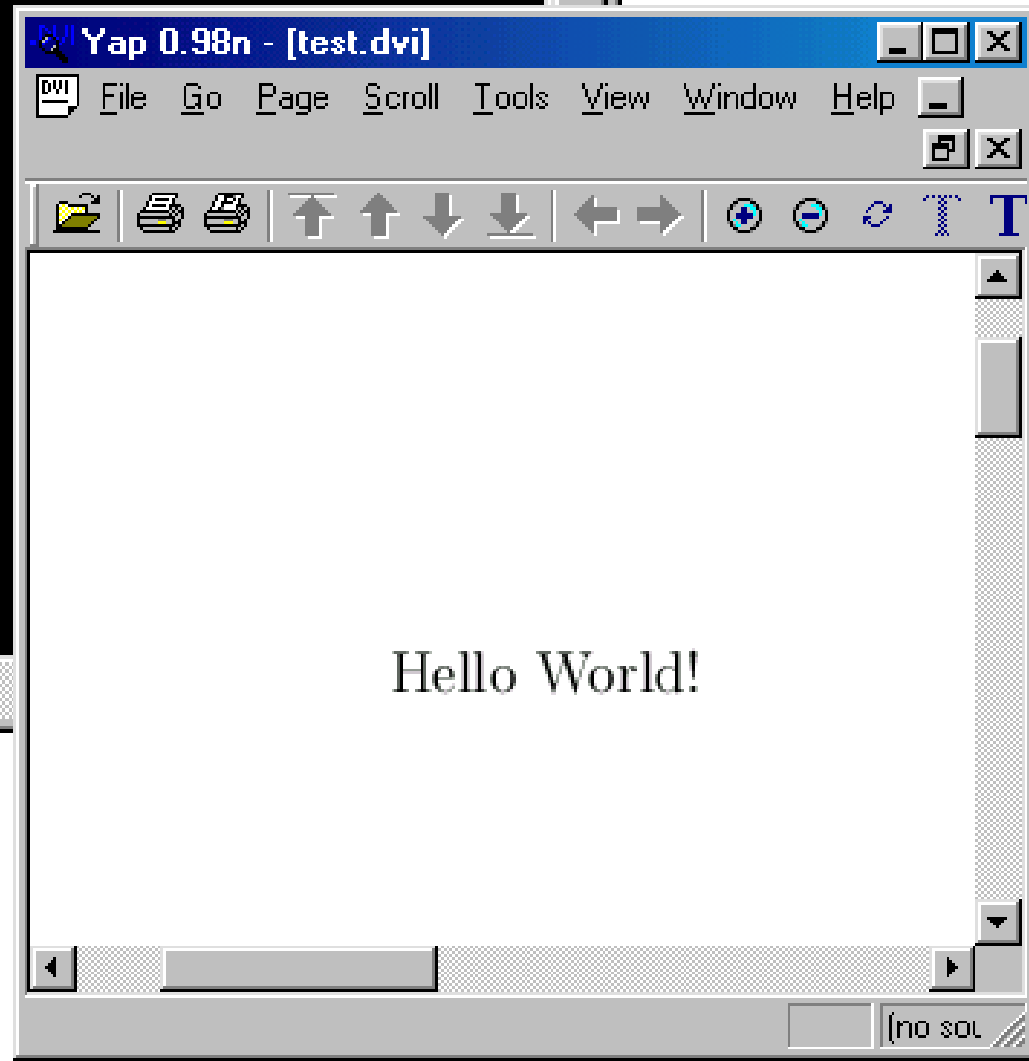
# Outline

- Starting Out.
- LaTeX as your word processor.
- Compose formulas.
- Include pictures and figures.

The screenshot shows a Gvim window titled "test.tex (t:\) - Gvim". The menu bar includes "File", "Edit", "Tools", "Syntax", "Buffers", "Window", and "Help". The main text area contains the following LaTeX code:

```
\documentclass[12pt]{article}
\begin{document}
Hello World!
\end{document}
```

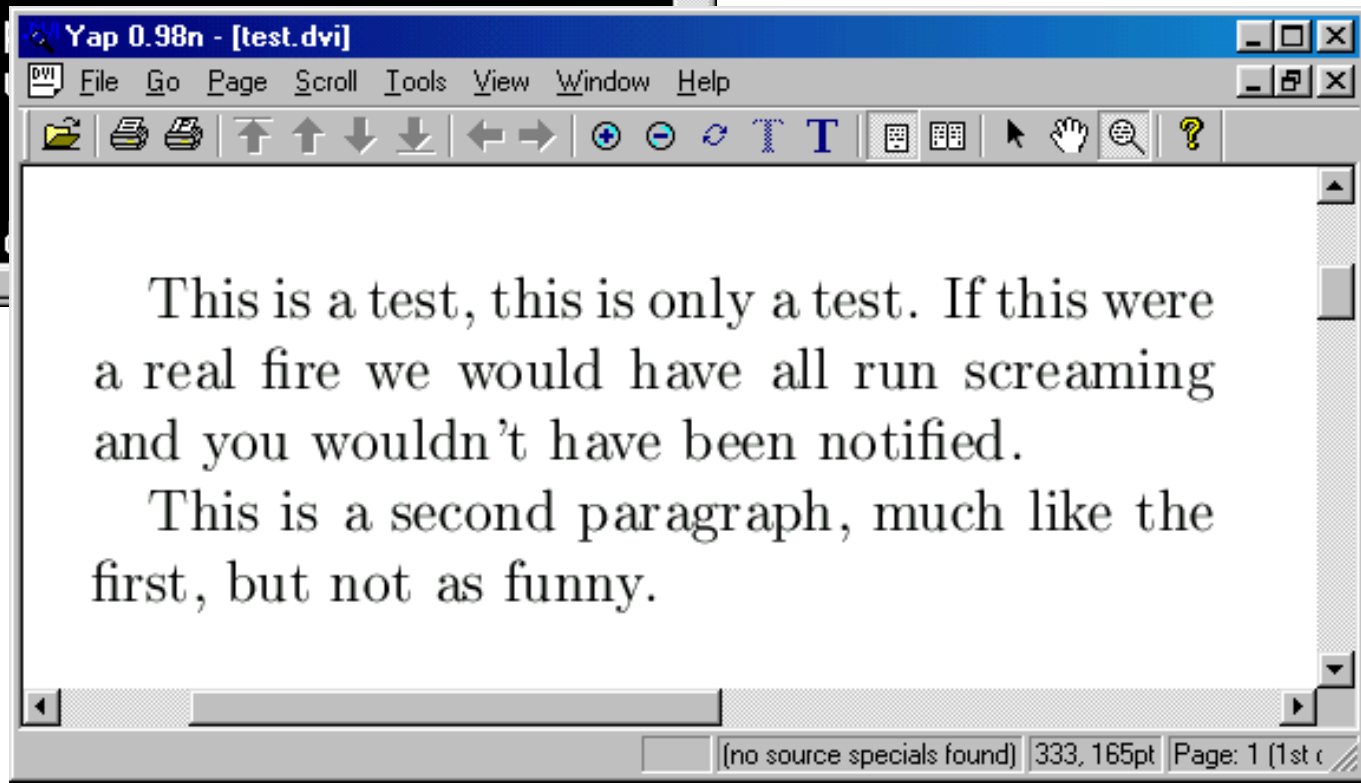
The code is color-coded: backslashes are yellow, documentclass and end are yellow, and article, document, and end are purple. A white cursor is positioned at the end of the first line. The status bar at the bottom left shows a left-pointing arrow.



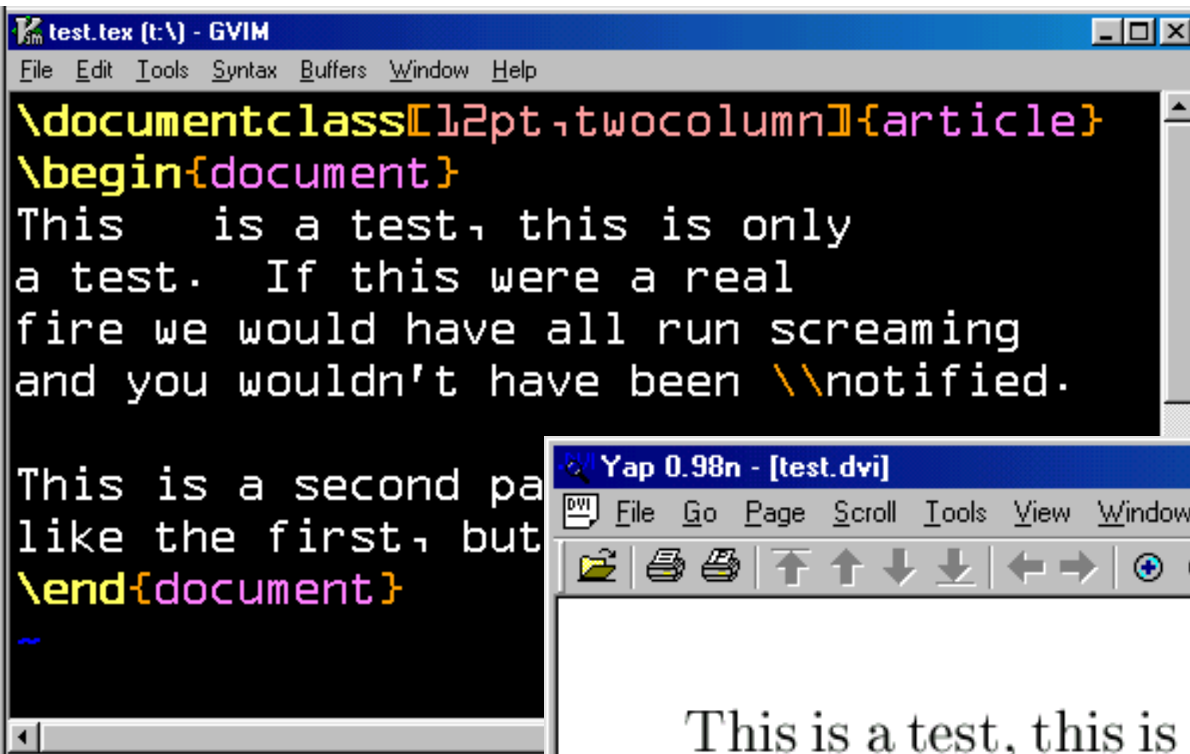
# Spacing, sentences, paragraphs

```
test.tex [t:\] - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
This is a test, this is only
a test. If this were a real
fire we would have all run screaming
and you wouldn't have been notified.

This is a second
like the first, but
\end{document}
~
"test.tex" 10L, 2
```

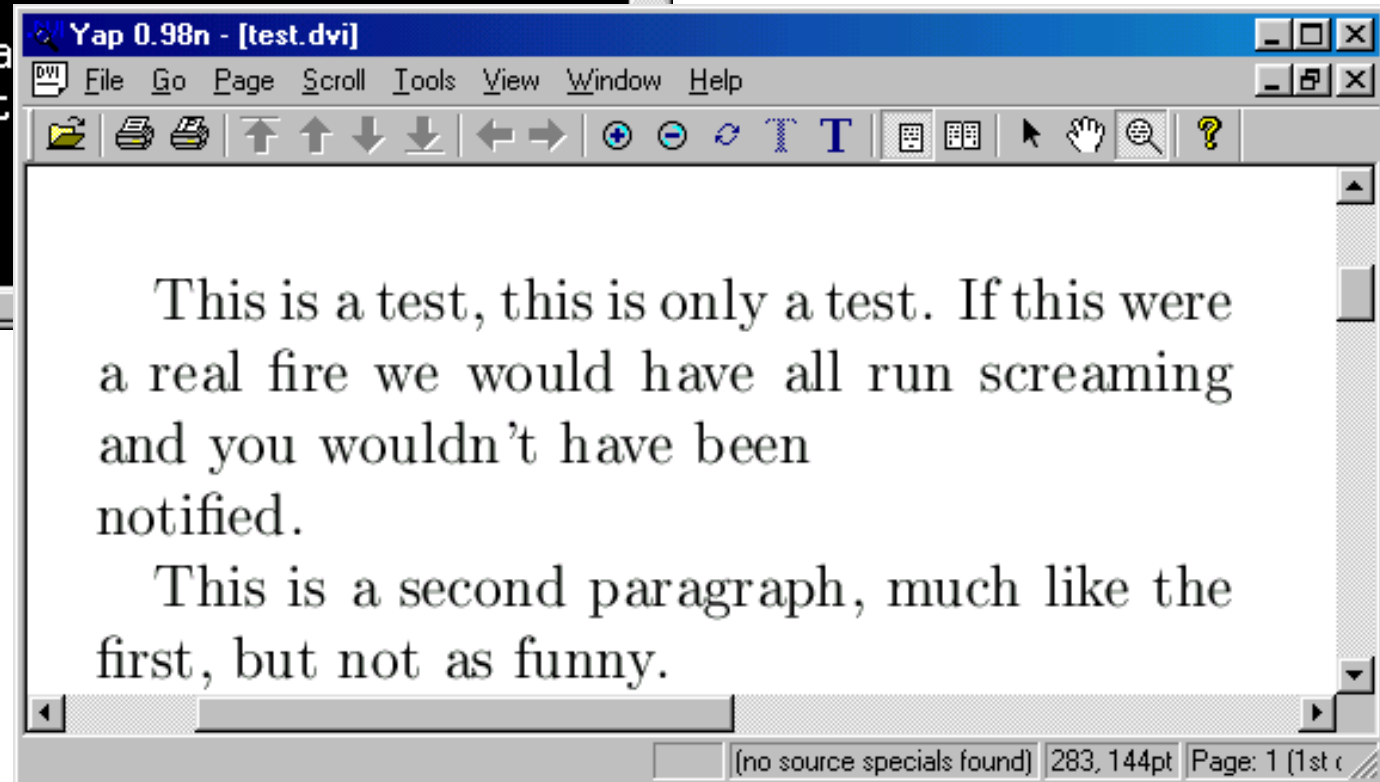


# using `\\` for line breaks



```
test.tex [t:\] - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
This is a test, this is only
a test. If this were a real
fire we would have all run screaming
and you wouldn't have been \\notified.

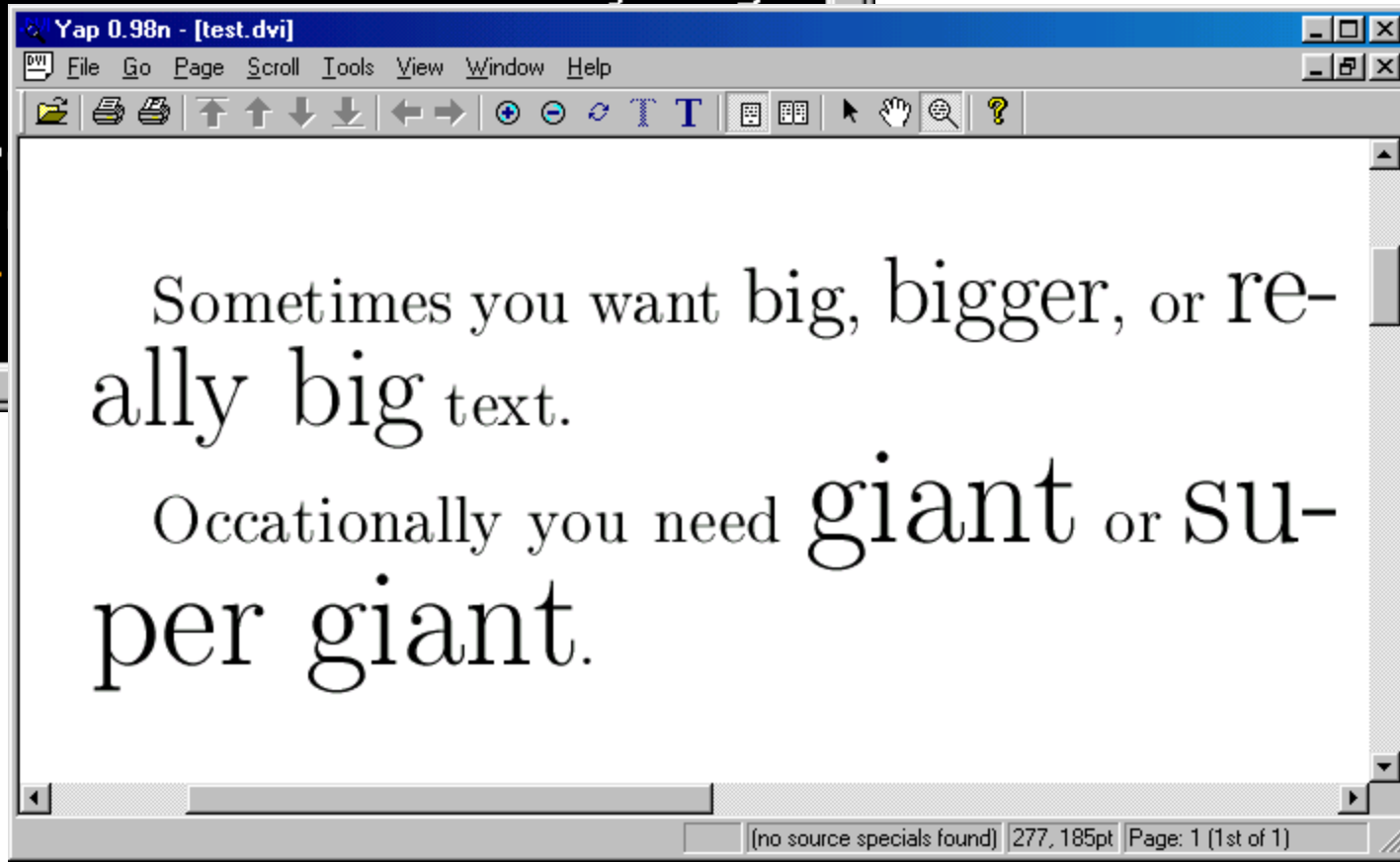
This is a second para
like the first, but
\end{document}
~
```



# changing the font size

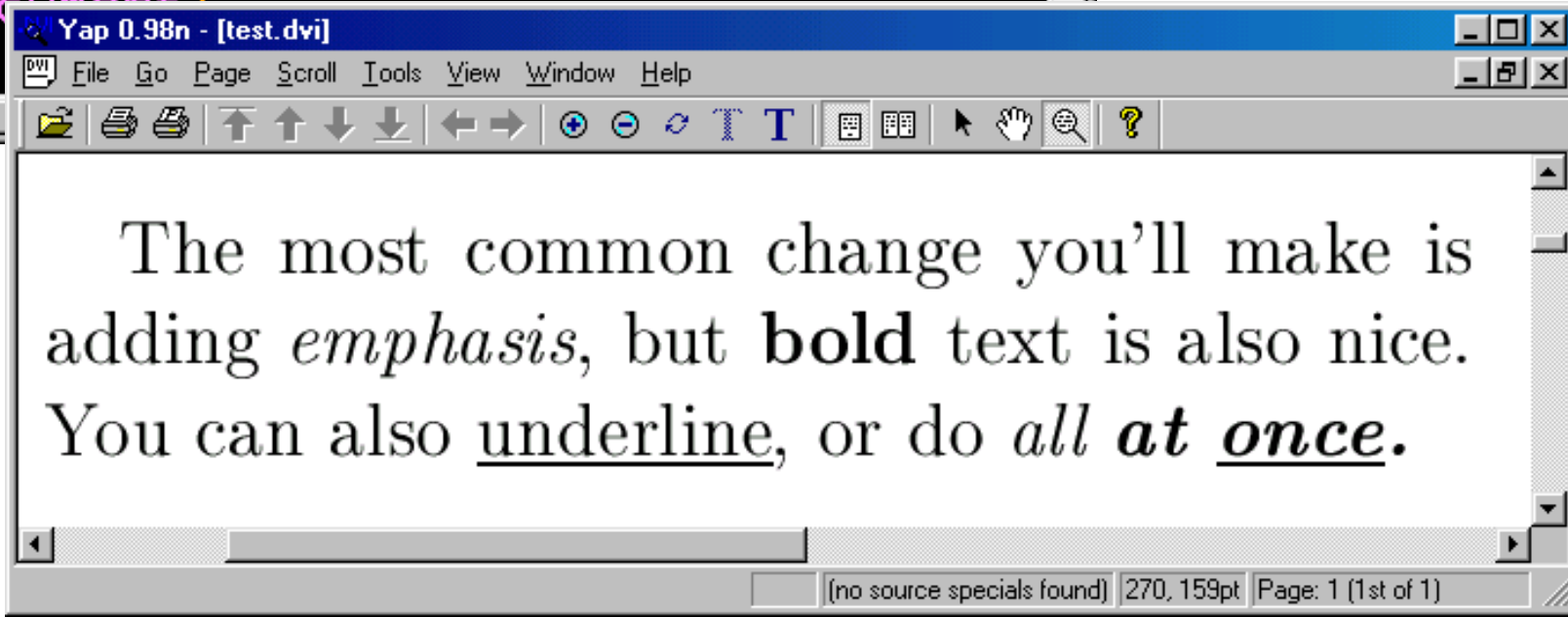
```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
Sometimes you want {\large big},
{\Large bigger}, or {\LARGE really big}
text.

Occasionally y
{\huge giant}
\end{document}
```



# changing the font style

```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
The most common change you'll make
is adding {\em emphasis}, but
{\bfseries bold} text is also nice.
You can also \underline{underline},
or do \em all \bfseries at
\underline{once}.
\end{document}
```



# justifications

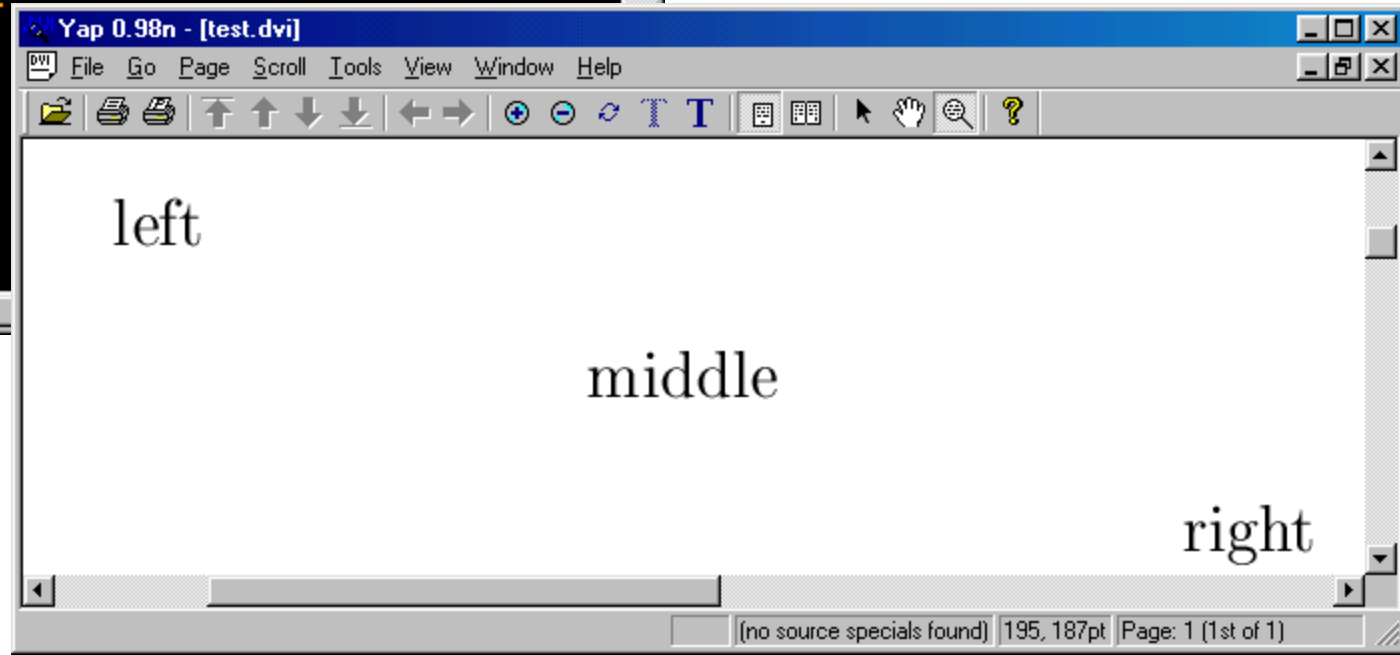
```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}

left

\begin{center}
middle
\end{center}

\begin{flushright}
right
\end{flushright}

\end{document}
```

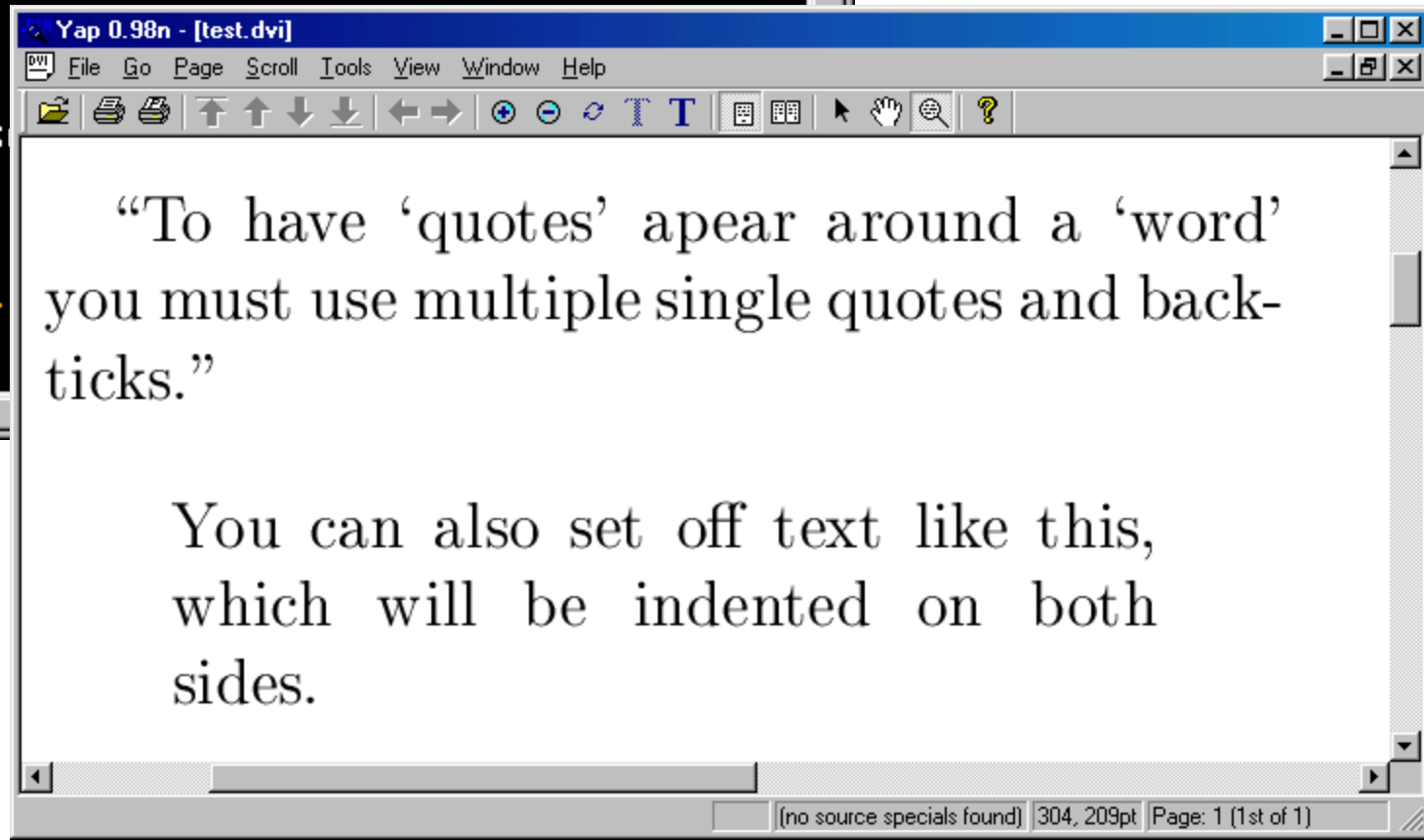




# quoting

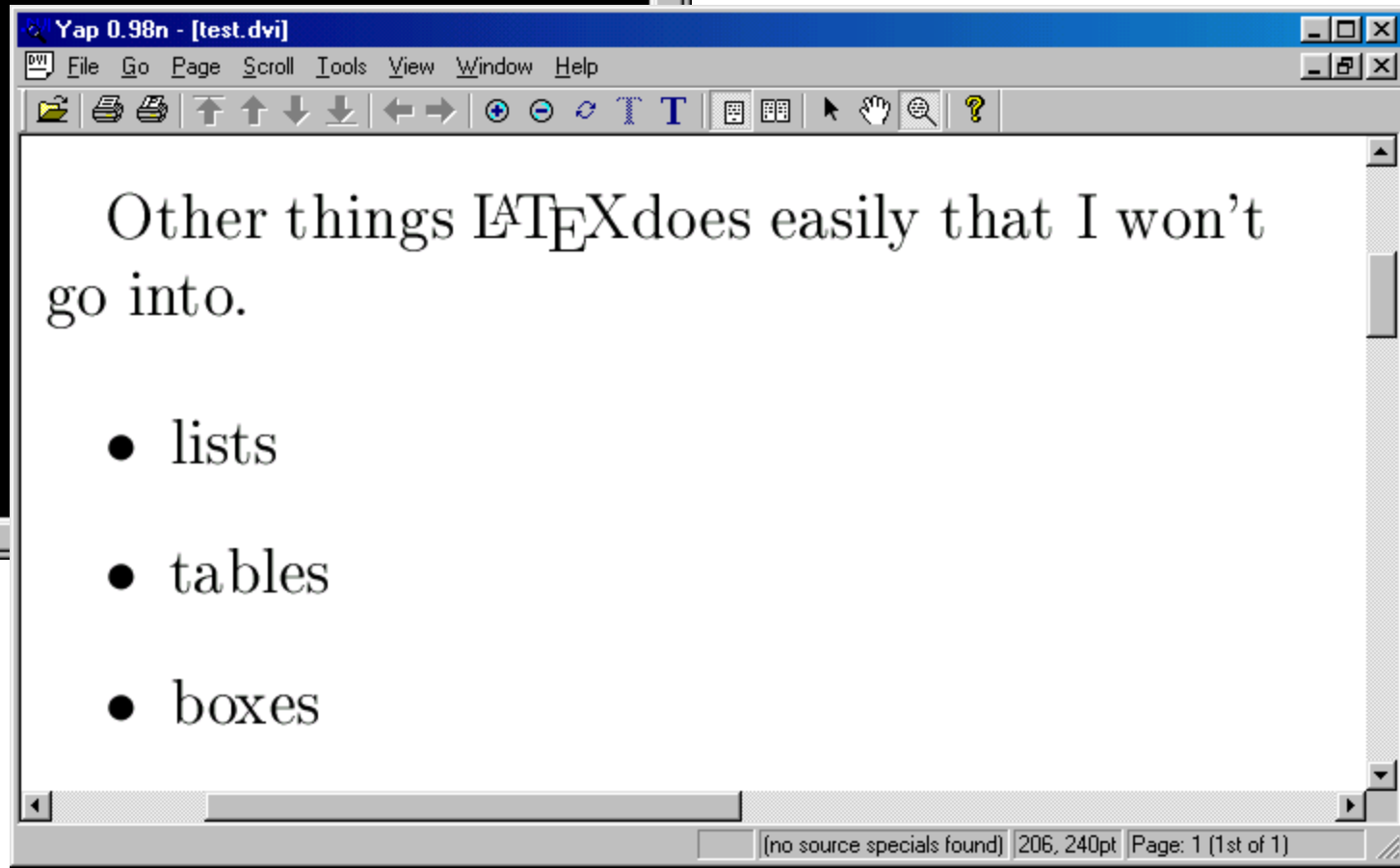
```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
``To have `quotes' apear around
a `word' you must use multiple single
quotes and backticks.''
```

```
\begin{quote}
You can also s
which will be
\end{quote}
\end{document}
```

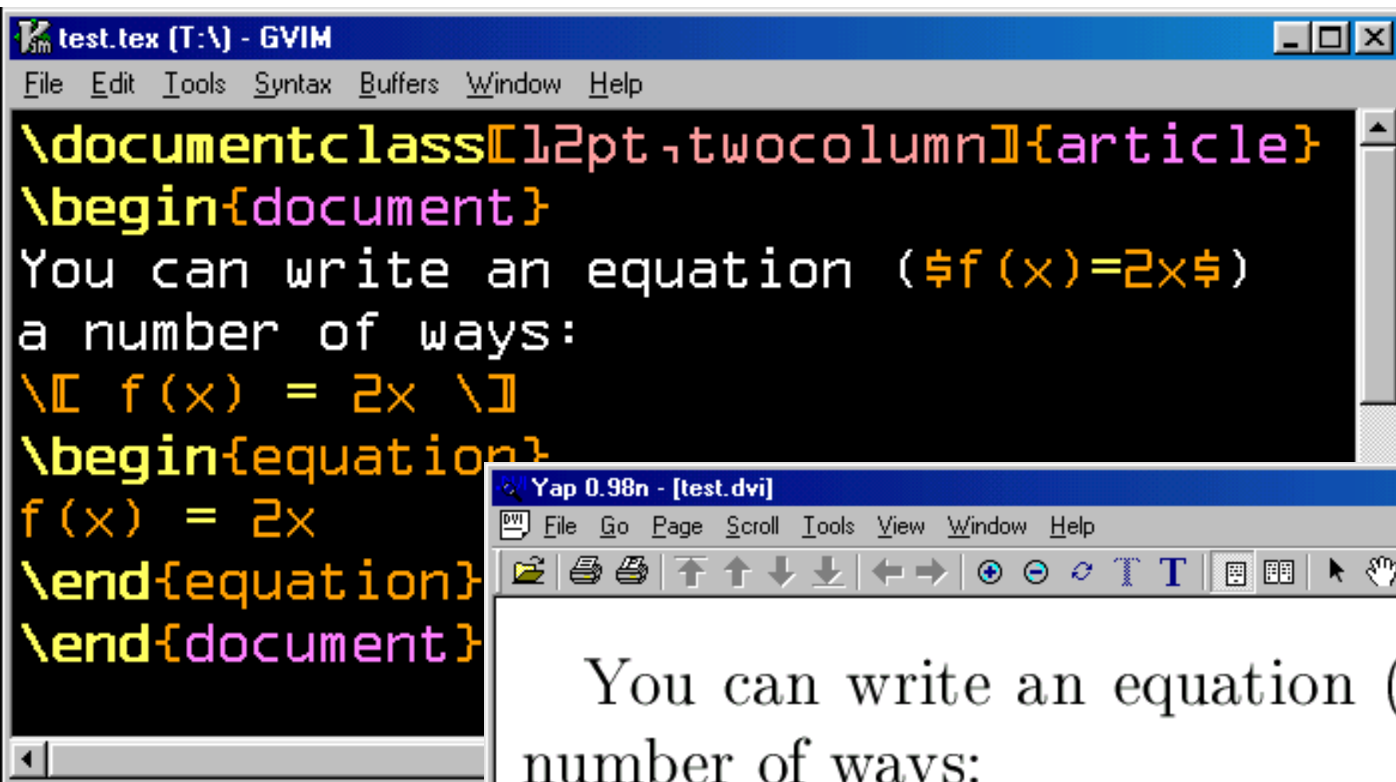


# other tricks

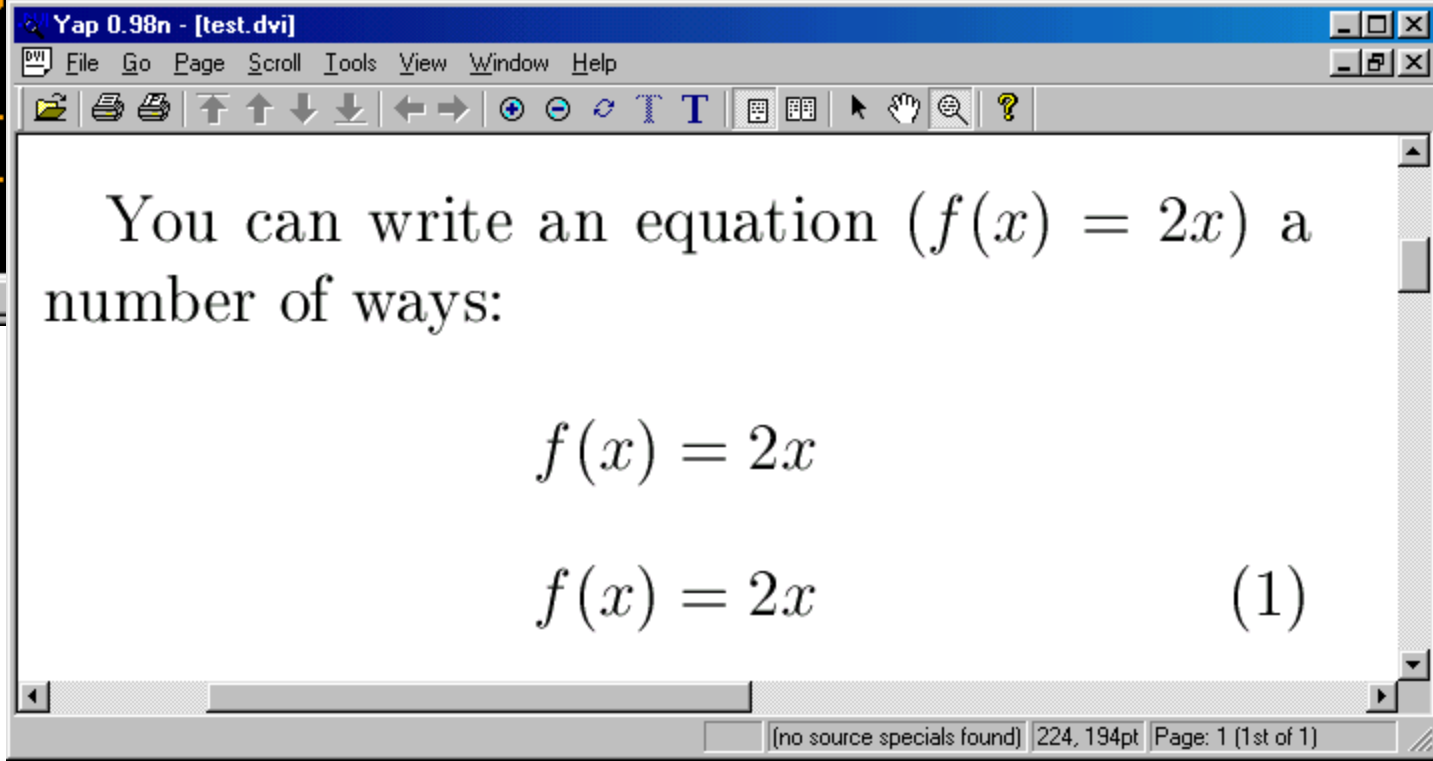
```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
Other things \LaTeX does easily
that I won't go into.
\begin{itemize}
\item lists
\item tables
\item boxes
\end{itemize}
\end{document}
~
~
```



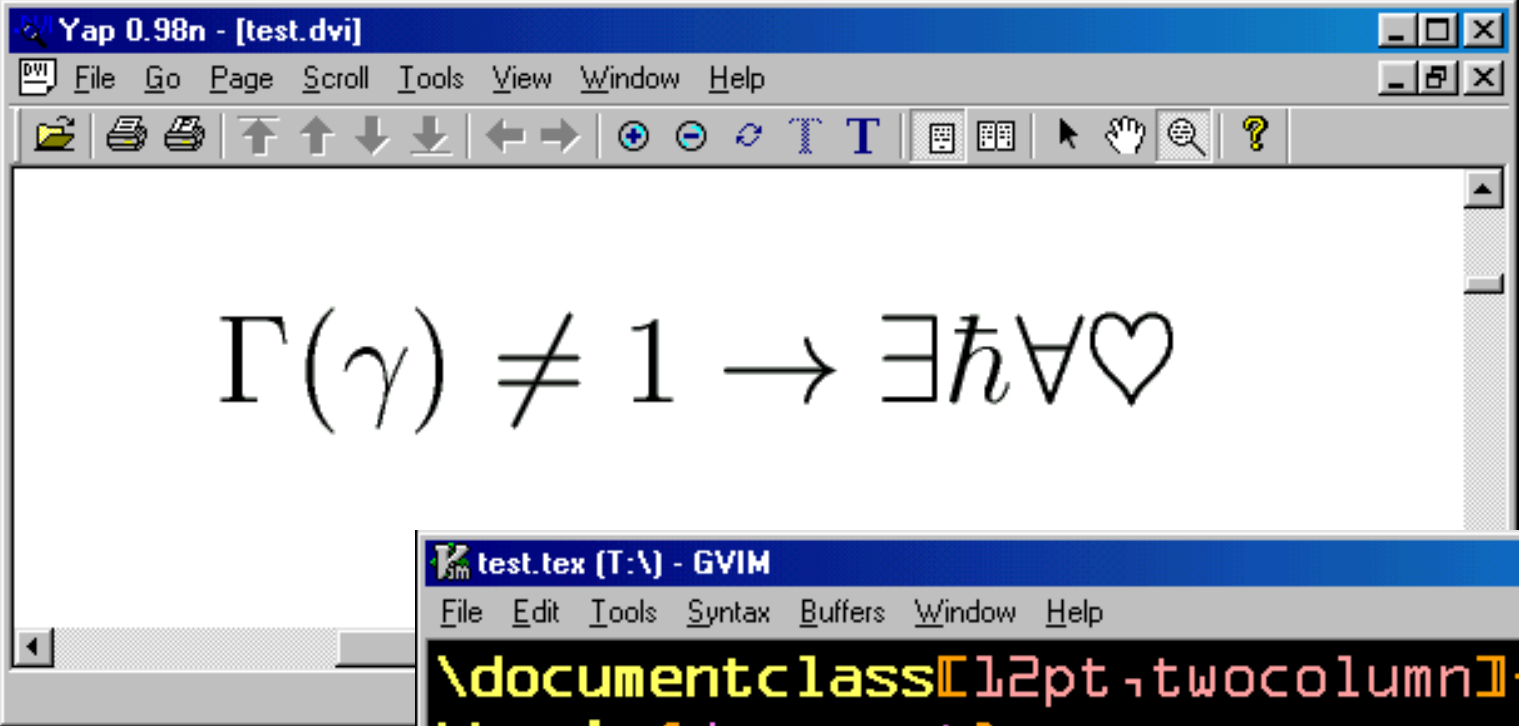
mmm. math mode.



```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
You can write an equation ( $f(x)=2x$ )
a number of ways:
\[\[ f(x) = 2x \]
\begin{equation}
f(x) = 2x
\end{equation}
\end{document}
```

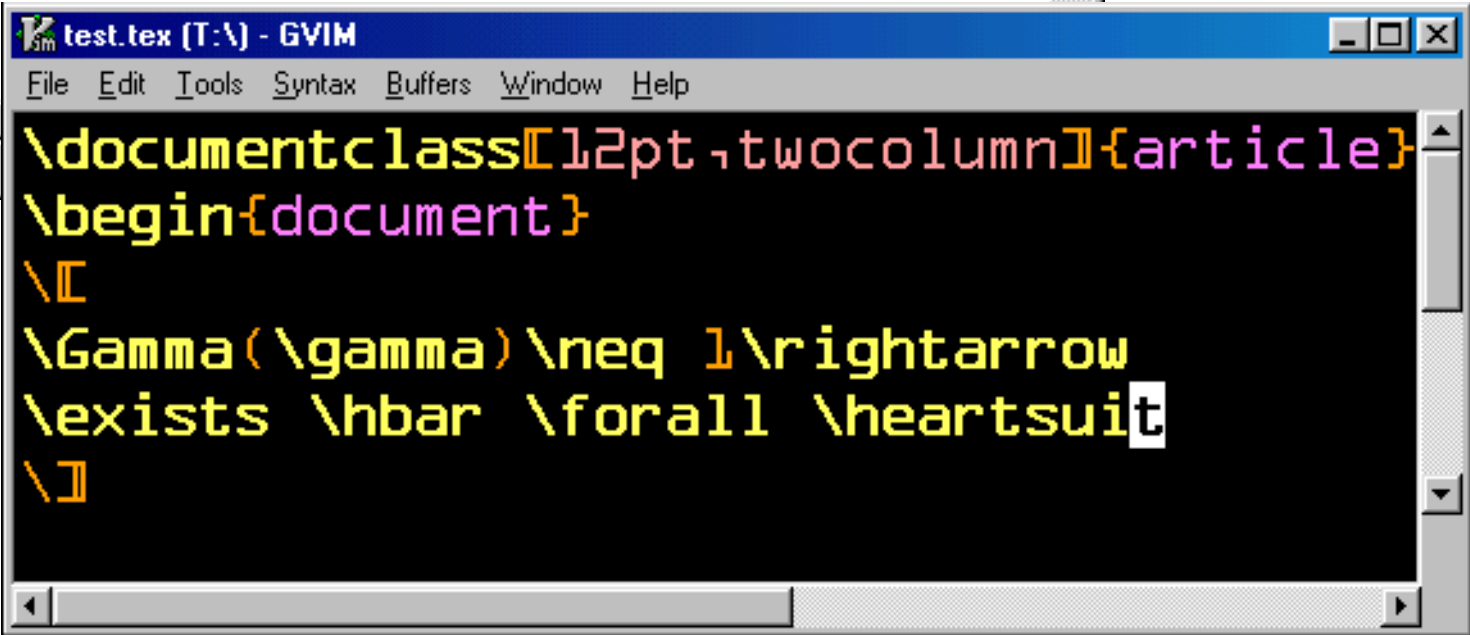


# the big secret of LaTeX



The screenshot shows a window titled "Yap 0.98n - [test.dvi]". The window contains a large white area with the rendered LaTeX expression  $\Gamma(\gamma) \neq 1 \rightarrow \exists \hbar \forall \heartsuit$  centered on the page. The window has a menu bar with "File", "Go", "Page", "Scroll", "Tools", "View", "Window", and "Help". Below the menu bar is a toolbar with various icons for navigation and editing.

$$\Gamma(\gamma) \neq 1 \rightarrow \exists \hbar \forall \heartsuit$$



The screenshot shows a window titled "test.tex (T:\) - GVIM". The window contains the LaTeX source code for the rendered output. The code is as follows:


```
\documentclass[12pt,twocolumn]{article}
\begin{document}
\[\Gamma(\gamma) \neq 1 \rightarrow \exists \hbar \forall \heartsuit\]
\end{document}
```

# subscripts, superscripts

```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\l[
z_{1} = x^{22} > 2^{2^2}
\r]
\end{document}
```

Yap 0.98n - [test.dvi]

File Go Page Scroll Tools View Window Help

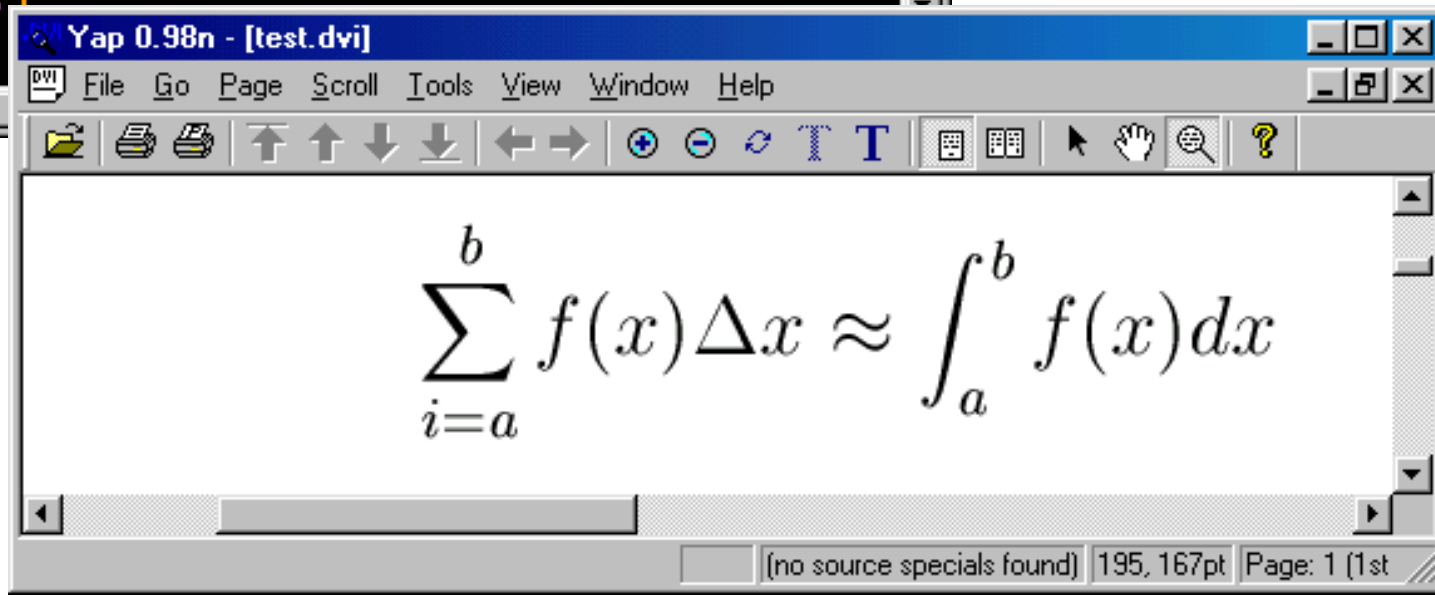


$$z_1 = x^{22} > 2^{2^2}$$

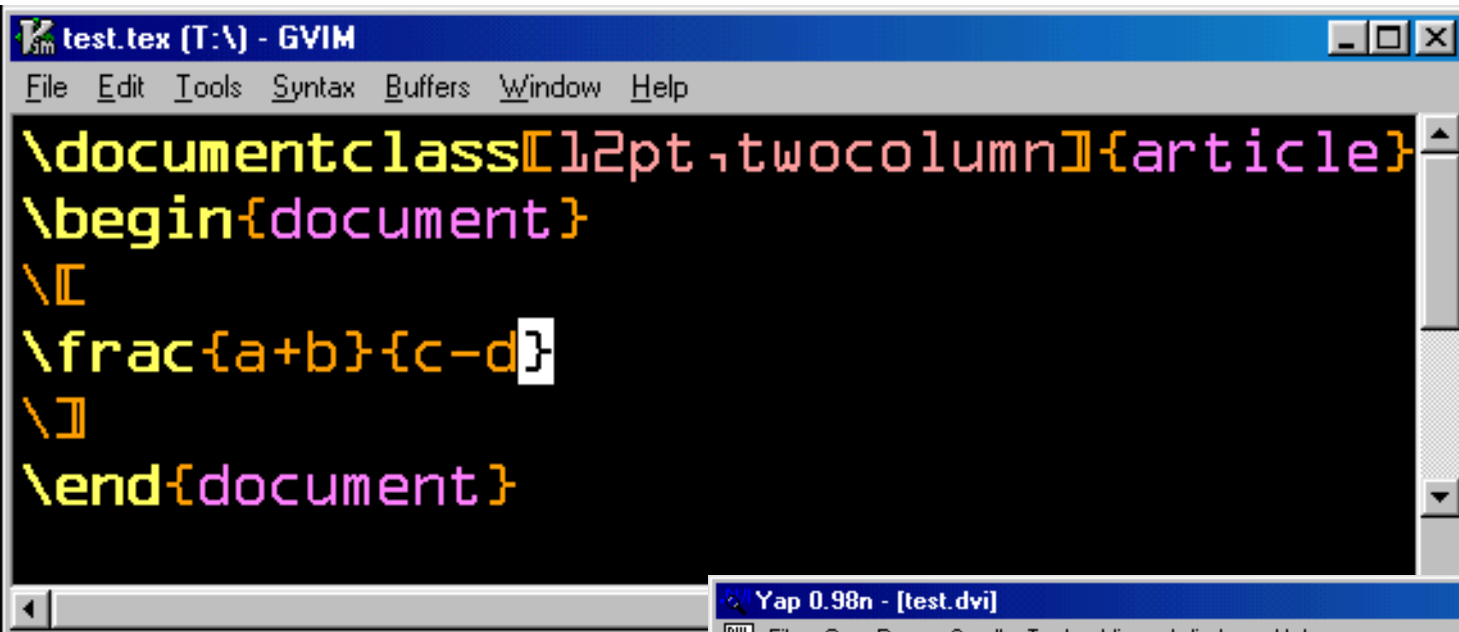
(no source specials found) 174, 161pt Page: 1 (1st

# integrals, summations

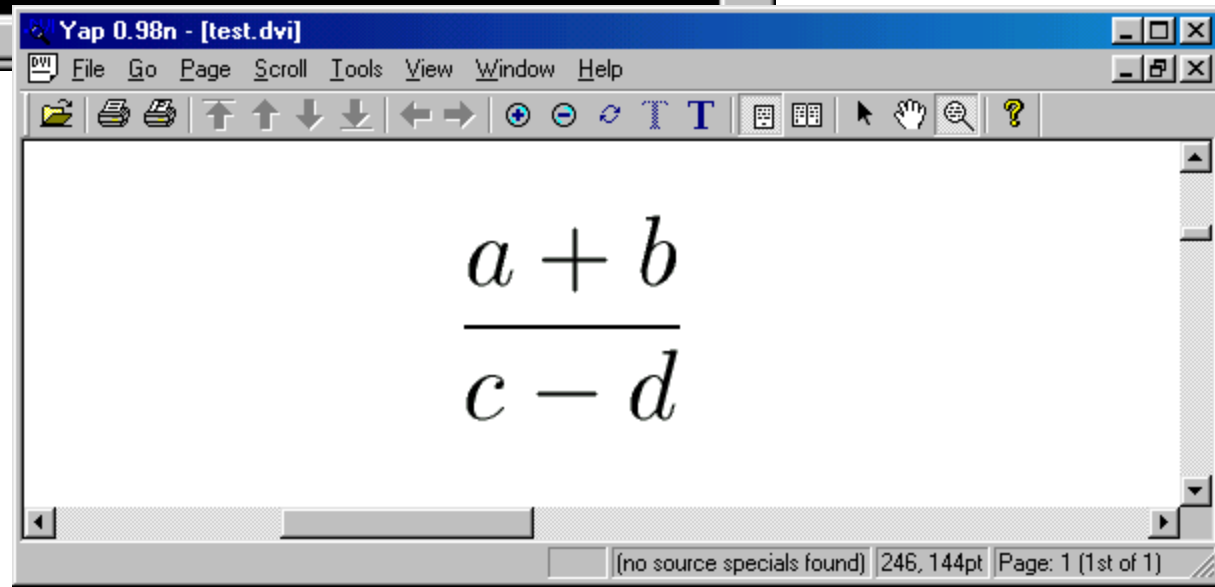
```
test.tex [T:\] - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\[\sum_{i=a}^b f(x) \Delta x \approx \int_a^b f(x) dx\]
\end{document}
```



# fractions

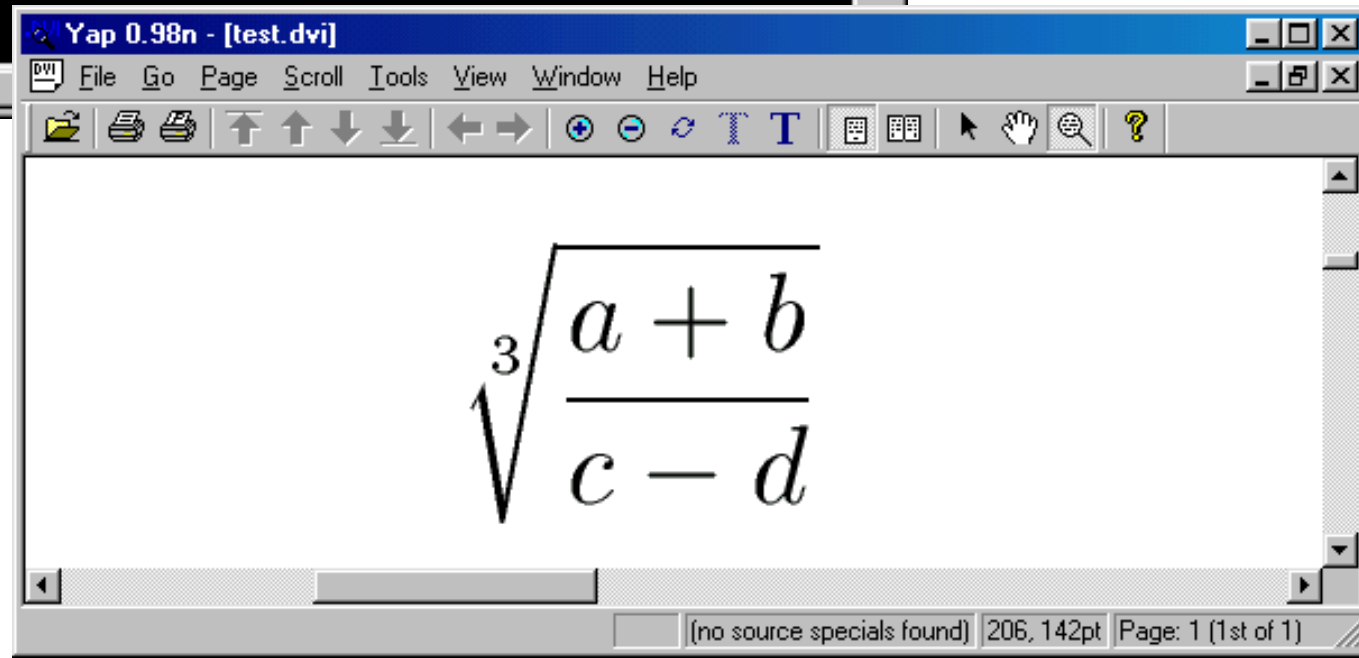


```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\l[
\frac{a+b}{c-d}
\r]
\end{document}
```



# square-roots

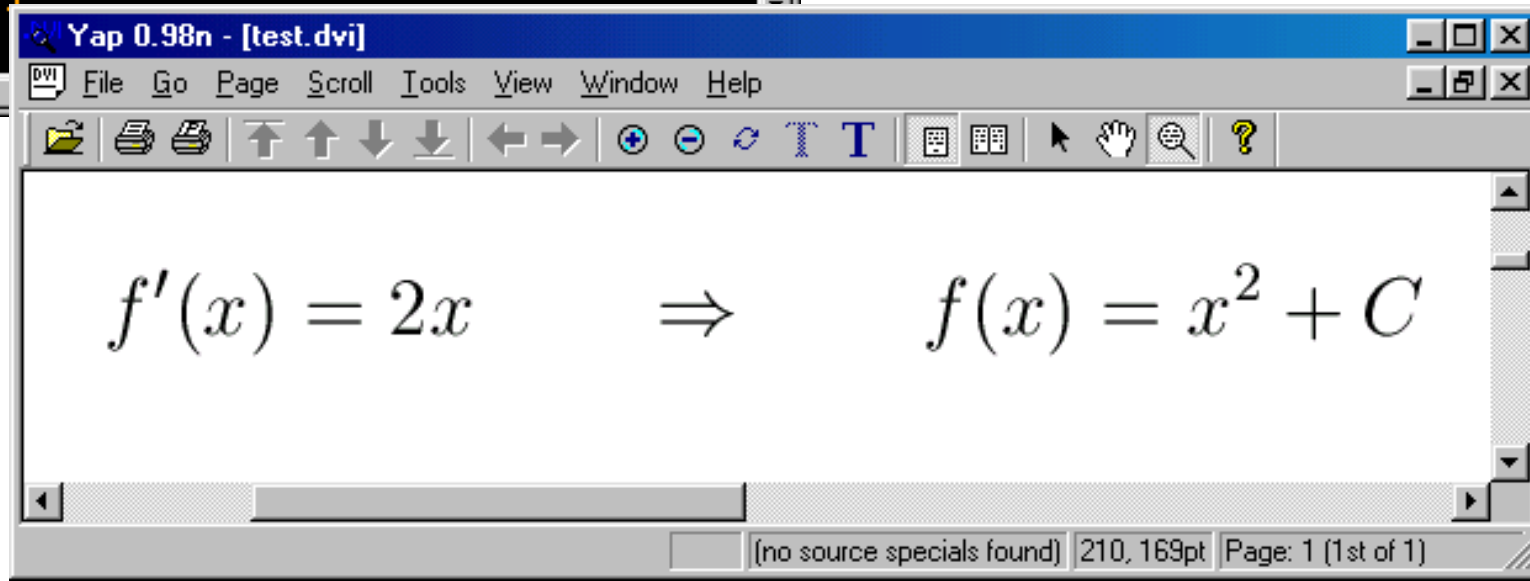
```
test.tex [T:\] - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\[\[
\sqrt[3]{\frac{a+b}{c-d}}
\]
\end{document}
```





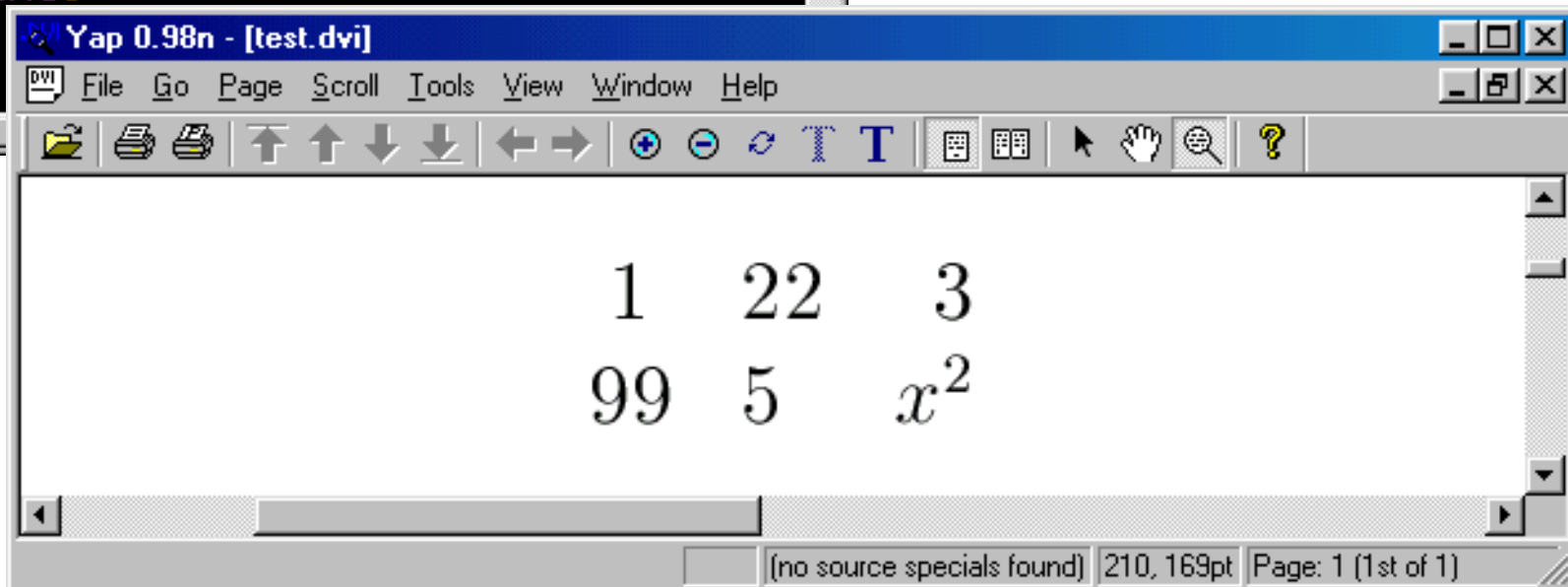
# insert your own spacing

```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\l
f'(x) = 2x
      \hspace{2em}
\Rightarrow
      \hspace{2em}
f(x) = x^2 + C
\l
\end{document}
```



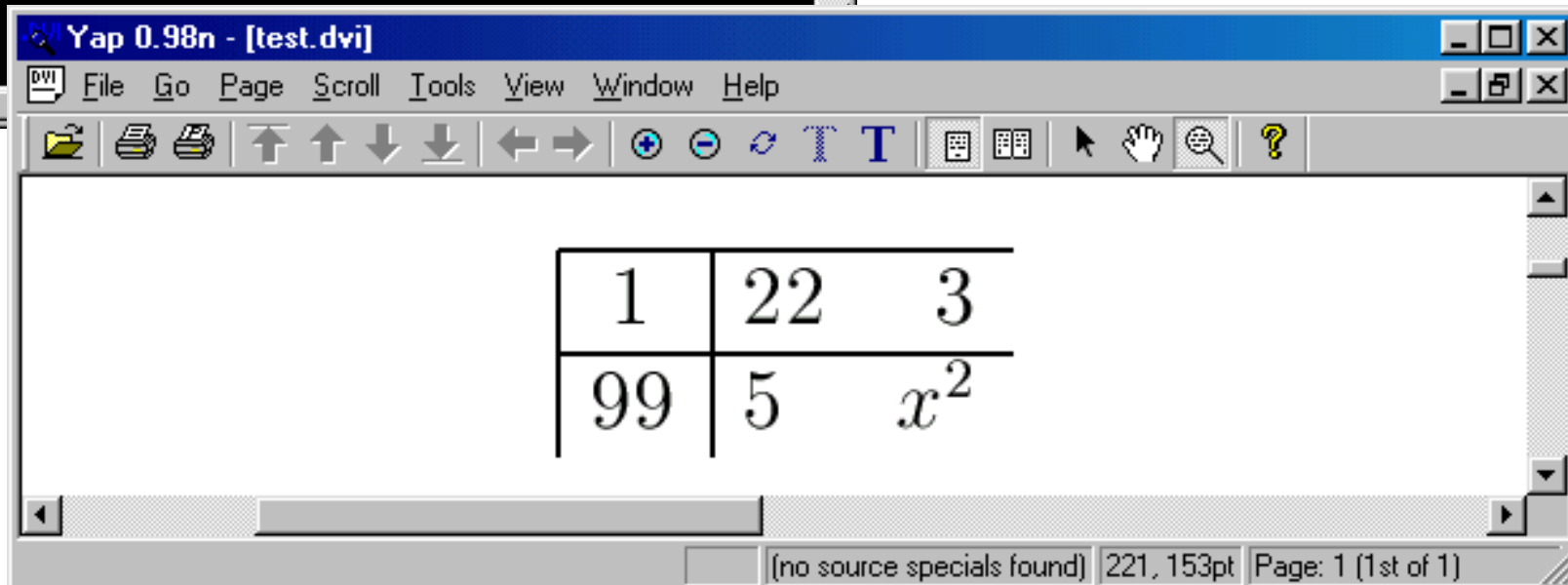
use 'array' to make tables & matrices

```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\l[
\begin{array}{c}
1 & 22 & 3 \\
99 & 5 & x^2
\end{array}
\r]
\end{document}
```



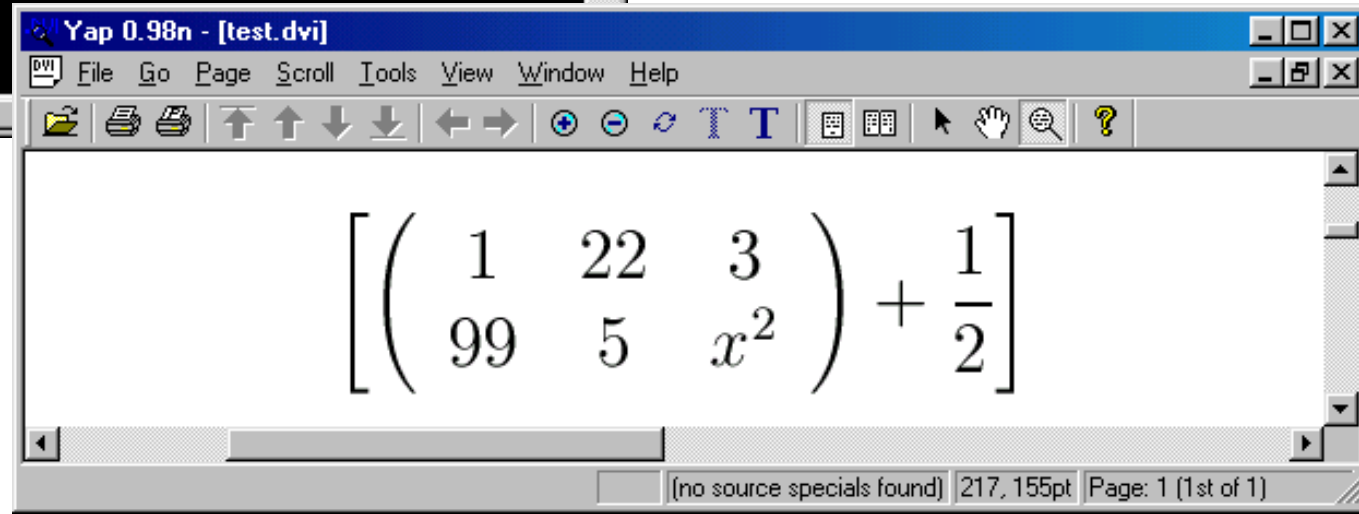
# adding lines & borders

```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\l
\begin{array}{|c|l|r}
\hline
1 & 22 & 3 \\
\hline
99 & 5 & x^2
\end{array}
\end{document}
```

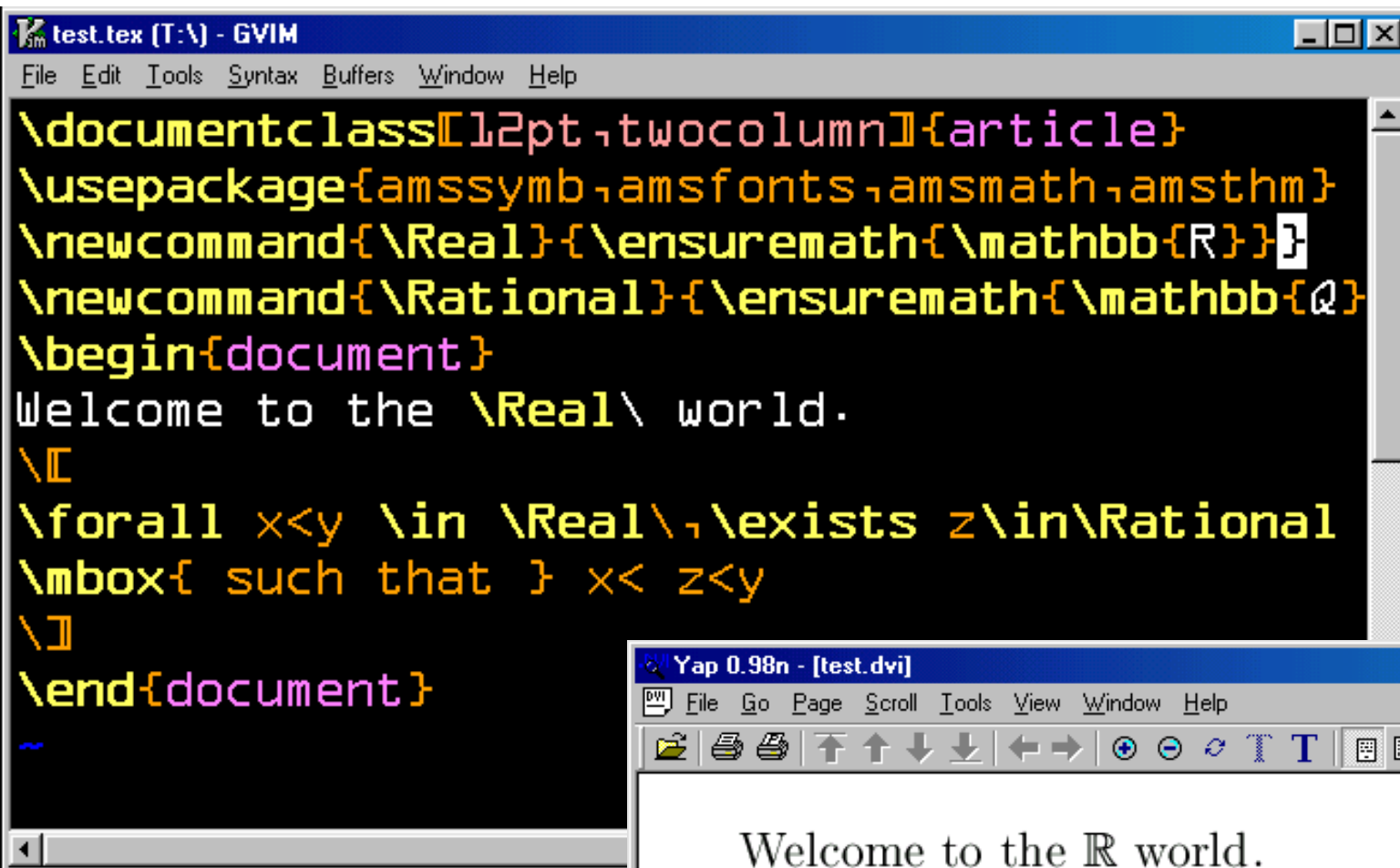


# grouping with parentheses

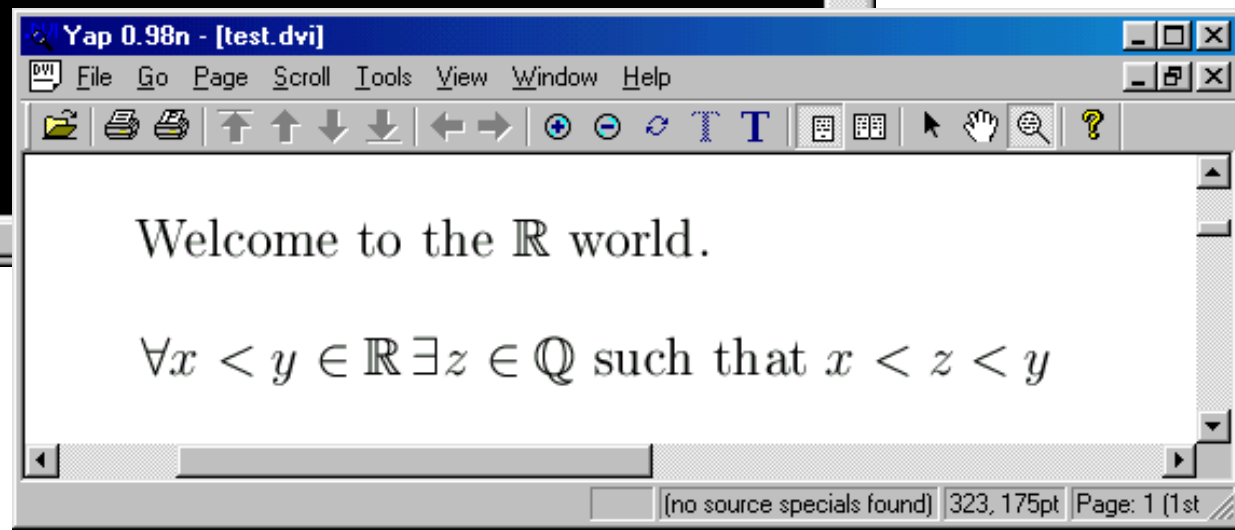
```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\l[
\left[
\left(
\begin{array}{ccc}
1 & 22 & 3 \\
99 & 5 & x^2
\end{array}
\right)
+\frac{1}{2}\right]
```



# There and back again.



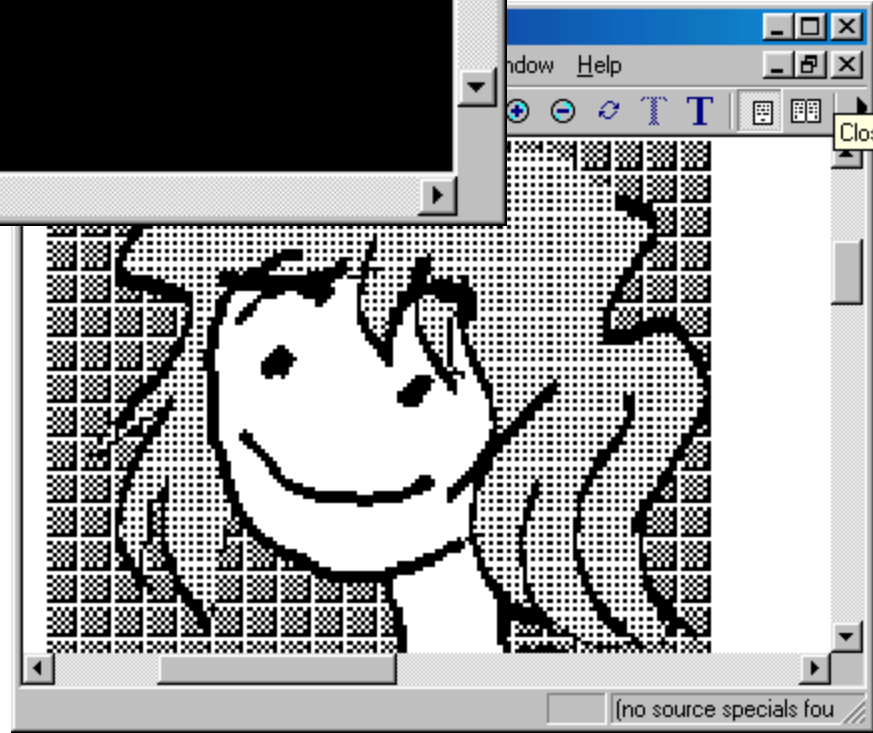
```
test.tex [T:\] - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\usepackage{amssymb,amsfonts,amsmath,amsthm}
\newcommand{\Real}{\ensuremath{\mathbb{R}}}
\newcommand{\Rational}{\ensuremath{\mathbb{Q}}}
\begin{document}
Welcome to the \Real world.
\[\forall x < y \in \Real, \exists z \in \Rational
\mbox{ such that } x < z < y\]
\end{document}
```



# getting visual: images

```
test.tex [T:\] - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\usepackage{epsfig}
\begin{document}
\epsfig{file=smile.eps}
\end{document}
~
```

Must be in .eps format!  
Use “convert” (unix).



# drawing your own pictures

```
test.tex (T:\) - GVIM
File Edit Tools Syntax Buffers Window Help
\documentclass[12pt,twocolumn]{article}
\begin{document}
\setlength{\unitlength}{1cm}
\begin{picture}(5,5)
\thicklines
\put(2,2){\circle{.5}}
\put(2,2){\circle*{.1}}
\put(2.2,2.2){\vector(1,1){.4}}
\put(3,2){\circle{.5}}
\put(3,2){\circle*{.1}}
\put(3,1.75){\line(0,-1){.5}}
\put(2.75,1.5){\line(1,0){.5}}
\qbezier(2,1.2)(2.5,.5)(3,1.2)
\end{picture}
\end{document}
```

