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This file is at <http://www.rasmusen.org/a/latex-rasmusen.pdf>.

These notes are **tips and tricks** that I have found useful or thought might be useful. I wrote these for my own use and have not tried to make them clear for others, but some other people will find them useful.

I often write xxx where a backslash should go, so you can see what the tex input commands are.

The source file is: <http://www.rasmusen.org/a/latex-rasmusen.tex>.

My email address is erasmuse@indiana.edu .

TYPE FONT SIZES

By default, LaTeX uses 10pt Computer Modern Roman as its base font. You can change this base font by using the 11pt or 12pt style option on the documentclass line like this:

```
xxxdocumentclass[11pt]article
```

10pt Default 11pt Option 12pt Option xxxtiny 5pt 6pt 6pt xxxscriptsize 7pt 8pt 8pt xxxfootnotesize 8pt 9pt 10pt xxxsmall 9pt 10pt 11pt xxxnormalsize 10pt 11pt 12pt xxxlarge 12pt 12pt 14pt xxxLarge 14pt 14pt 17pt xxxLARGE 17pt 17pt 20pt xxxhuge 20pt 20pt 25pt xxxHuge 25pt 25pt 25pt

The xxxresizebox command (from graphicx package) is convenient if you want to produce, e.g., a title that fills the entire page width: xxxresizeboxxxxlinewidth!xxxitshape Foo!

A large, bold, black serif font rendering of the word "Foo!". The letters are thick and have a classic, slightly ornate design. The exclamation point is also large and bold, matching the rest of the text.

For big font: xxxusepackagefix-cm
xxxnewcommandxxxbigfontxxxfontsize60pt70ptxxxselectfont
xxxnewcommandxxxsmallfontxxxfontsize6pt7ptxxxselectfont xxxbeginbigfontHere is my writing in a big font. xxxendbigfont

Here is my writing in a big font.

Here is my writing in a small 6/7 font.

MARGIN COMMENTS

`xxxnewcommandxxxmargincomment[1] xxxmboxxxxmarginparxxxtinyxxxhspace0pt pound-`
`sign 1`

`xxxmargincomment`Here is my comment

is my
ent

URLS, WEBLINK DISPLAYA:

`xxxusepackageurl xxxusepackagehyperref xxxhypersetupbreaklinks=true, colorlinks= true,`
`linkcolor=black, hyperfootnotes= false, urlcolor=blue xxxurlstylesame xxxusepackagebreakurl`

COLOR

`xxxusepackagecolor xxxnewcommandxxxred[1]xxxcolorredpoundsign 1 xxxcolorblack xxxnew-`
`commandxxxgreen[1]xxxcolorgreenpoundsign 1 xxxcolorblack`

`xxxnewcommandxxxmyheading[1] xxxnoindent xxxcolorbluexxxsc poundsign 1xxxcolor-`
`black`

`xxxmyheading`Here is the Heading

Here is some red writing.

SPACES

A single backslash `xxx` will make sure that there is just a single space after a word. This is useful after a period which does not end a sentence, e.g. in Mr. `xxx` Jones, so there is just one space after the period.

For a negative space in math mode, use `xxx!`

For a normal-width space use `xxx:`, backslash-colon This is very useful for alignment in tables.

xxxhfill and xxxvfill both put space in up to the limits of the page borders. Thus, Top of page xxxvfill Bottom of page will fill up an entire page, with blank space in the middle.

xxxvspace*24pt and xxxhspace*32pt do the obvious things.

The command `\tilde` is supposed to prevent a linebreak.

USING SUBSCRIPTS AND SUPERSCRIPTS TOGETHER

MAKING DIGITS AND LETTER SUBSCRIPTS LOOK OK TOGETHER, CHANGING THE FONT SIZE

This happens if and only if

$$-f_{11} + \sum_{j=2}^n \frac{f_{1j}^2}{\lambda^{2j}} \geq 1$$

How to make x_j^i different from x_j^i .

$X_i^{xxxphantomij}$ and $X_{xxxphantomji}^j$?

`"Some useful tips and tricks in LaTeX".`

FLOATS I have not figured out a good way to deal with floats, to get diagrams where I want them. A couple of promising packages are:

`xxxusepackagefloat xxxusepackageafterpage`

`xxxbeginfigure[h!]` This is supposed to make the figure go right at this point in the paper.
`xxxendfigure`

This command is supposed to clear out the floats after teh current page is done filling up:
`xxxafterpagexxxclearpage .`

- ENDNOTES

`xxxusepackageendnotes xxxletxxxfootnote=xxxendnote`

This will make every use of the Footnote command and endnote.

At the end of the document, put `xxxtheendnotes` to have them print out.

In Latex, how do I set up a link to <http://rasmusen.org/religion.htm> that show up in the text as LINK-MINE?

Put `xxxusepackagehyperref` in your header, and when you want to link to a page, use the command `xxxhrefhttp://rasmusen.org/religion.htmLINK-MINE`.

It works like [this](#).

PUTTING A CIRCLE AROUND SOME TEXT:

```
xxxusepackagetikz
```

```
xxxnewcommand*xxxmycircle[1] xxxbegintikzpicture[baseline=(C.base)] xxxnode[draw,circle,inner  
sep=1pt](C) #1; xxxendtikzpicture
```

```
xxxmycircleNight
```

Ⓝight, N Ⓢight, Ⓝight

LANDSCAPE VIEW

Changing the whole document to landscape can be done by using the `geometry`-package:

```
xxxusepackage[landscape]geometry
```

Next I will show you how to change the page layout of single pages. The `lscap`-package provides according possibilities:

```
xxusepackagelandscape
```

With

```
xxxbeginlandscape
```

```
dfgdfsg
```

```
xxxendlandscape
```

<http://texblog.wordpress.com/2007/11/10/landscape-in-latex/>

LOOKING AT THE PDF OUTPUT WHILE EDITING If you produce a pdf file and it is open with Adobe Reader, you can't run your tex file through again— it stops. Instead, use **EVINCE**, another pdf reader, at least while you are editing the file.

CENTERING VERTICALLY ON A PAGE

Here is the stuff to center with the same vertical distance above and below. The commands you can't see are

```
xxxnewpage
```

```
xxxvspace*xxxfill
```

```
text here
```

```
xxxvspace*xxxfill
```

```
xxxnewpage
```

DOUBLE SPACING

The following command changes to 1.2 spacing:

```
xxxrenewcommandxxxbaselinestretch1.2
```

xxxusepackage`setspace` followed by xxx`doublespace` does double spacing, without using `doublespacing` in footnotes and table captions and suchlike. xxx`beginsinglespace` and xxx`endsinglespace` then are used to have singlespacing of some packages.

I also use `setspace` in making a new command for indented singlespaced quotations:

```
Here is the quotation.  
I'll put linebreaks in to make it  
three lines long.
```

```
xxxnewenvironmentbigquote xxxbeginquotation xxxbeginsmall xxxbeginsinglespace xxxends-  
inglespace xxxendsmall xxxendquotation
```

```
xxxbeginbigquote Here is the quotation. xxxxxx I'll put linebreaks in to make it xxxxxx  
three lines long. xxxendbigquote
```

END OF PROOF

Here is the rproof, and it ends. \square

xxx`qed` is the input symbol.

This needs the package xxx`usepackageamsthm`, Theorem environments

SYMBOLS FOR WRITING LEGAL BRIEFS

¶9 §42 56

```
\P 9 \S 42 \dotfill 56
```

INDICATOR SIGNS

Use I_{gi} as a variable which equals 1 if agent i picks an action that costs him g and 0 otherwise.

FOR LOOKING UP LATEX SYMBOLS:

This is great! <http://detexify.kirelabs.org> and http://detexifyblog.kirelabs.org/past/2009/7/19/detexify_explained

`xxxmbox` and `xxxfbox` make boxes without and with borders, to keep text together. There can't be a line break in the middle of that kind of box. For a box that spans multiple lines, use

`xxxusepackageboxedminipage xxxfboxsep=12pt` needs to be set for around big blocks of text, with `boxedminipage`, but if you are just using `fbox` for one word or symbol, change it to `xxxxfboxsep=.2pt`

Text that I want to box, such as a game description, goes here. The box width is .6 of entire line . It splits lines depending on how wide it is, to squish the text into the box.

Put box around an equation like this:

$$5 = x^2 \quad \boxed{24v = 6\alpha t + (1 - \alpha)g^7} \quad 67 = \int_0^8$$

`\mbox` and `\fbox` make boxes without and with borders, to keep text together. There can't be a line break in the middle of that kind of box. For a box that spans multiple lines, use

```
xxxusepackage{boxedminipage}
```

```
\begin{boxedminipage}[c]{0.6\linewidth}
```

```
Text that I want to box, such as a game description, goes here. The box width is .6 of entire line  
\end{boxedminipage}
```

Put box around an equation like this:

```
$$  
5 = x^2 \; ; \; ; \; \fbox{$24v = 6\alpha t + (1 - \alpha)g^7$} \; ; \; ;  
67 =  
\int\limits_0^8  
$$
```

For BEAMER, the way to make a latex file into a presentation PDF similar to powerpoint, see' <http://www.rasmusen.org/a/beamer-rasmusen.tex> and <http://www.rasmusen.org/a/beamer-rasmusen.pdf>

RUNNING WITHOUT STOPPING FOR ERRORS

Insert the command `\batchmode` to run without error messages and without stopping for errors. The *.log file will still be created with all the errors listed in it.

NO AUX FILE OR OTHER SUCH CREATED

`\nofiles` is the command for that.

The *.log file gets created anyway, though.

DELETING FILES FROM WITHIN LATEX

My next task is to figure out how to have Latex clean up after itself, deleting the *.log, *.aux, temptex.txt, *.out files unless told not to.

To do this, which I haven't figured out yet, one uses the `write18` command. Here are some examples of how to use it generally

```
\write18erase temp1.*
```

```
\write18erase temp1.log ( doesn't work- new log created anyway.)
```

```
\write18copy temp.tex realname.tex
```

The `write18` command doesn't work unless you alter your latex operating files, though. The designers were fearful of security breaches, since the `write18` command would allow a *.tex file to have commands which could take over your computer and, for example, download virus files.

So here is how to enable the `write18` command:

```
EnableWrite18=t
```

Command execution either happens at `\output` time or right away, according to the absence or presence of the `\immediate` prefix.

<http://wiki.contextgarden.net/texmf.cnf>

```
in texmf.cnf set
```

```
shell_escape=t
```

In Miktex it is totally different. Follow the instructions in:

<http://wiki.contextgarden.net/write18>

In the DOS Shell run:

```
initexmf --edit-config-file=miktex\config\pdftex.ini
```

and put in the new empty file that creates,

```
EnableWrite18=t
```

Or, I think this would work: create a new file:

```
C:\Documents and Settings\All Users\Application  
Data\MiKTeX\2.7\miktex\config\pdftex.ini
```

Its only content should be

```
EnableWrite18=t
```

This will be a local supplement to the pdftex.ini file which is in wherever your Miktex2.7 main directory is, and I think it will not be erased when Miktex updates itself.

MOVING AUXILIARY STUFF INTO THE *.TEX FILE, BUT IN THE MIDDLE.

This takes a bunch of fancy stuff, but is not too hard. Here is an example file:

```
\documentclass[12pt]{article}
```

```
\batchmode
```

```
% Thus no error messages--see the *.log file for them.
```

```
\usepackage{filecontents}
```

```
\newif\ifauxfileexists \IfFileExists{temptex.txt}
```


GOOD PACKAGES AND FORMAT:

```
\usepackage[T1]{fontenc}
  \usepackage{lmodern}
&\usepackage{garamond}
%\usepackage{palatino}
% \usepackage{mathpazo}

\usepackage{verbatim}    % verbatim classes
  \usepackage{url} % appropriately display url's
\usepackage{hyperref} \hypersetup{breaklinks=true, pagecolor= white, colorlinks= true, linkcol
  \usepackage{longtable}
\usepackage{graphicx}
\usepackage{amsmath}

\reversemarginpar
  \topmargin -.3in  \oddsidemargin -.1in
  \textheight 8in  \textwidth 6in
  \baselineskip 16pt
\parindent 12pt  \parskip 10pt
```

PUTTING EVERYTHING INTO ONE *.TEX FILE

The filecontents environment will do this. It puts a section of text into a new file. If you want to overwrite a file name, or use this in the middle of a *.tex document instead of at the very beginning, though, you need to use the filecontents package. See <http://www.ctan.org/tex-archive/macros/latex/contrib/filecontents/>.

```
\usepackage{filecontents}

%The next section creates the file garamond.sty.
\begin{filecontents}{garamond.sty}
%%
%% This is file 'garamond.sty'
%%
%% This file is under the public domain.
%% Original author: Gael Varoquaux
%%      gael dot varoquaux at normalesup dot org
\pdfmapfile{=ugm.map}
\let\rmdefault@garamond\rmdefault%
```

```

\newcommand{\garamond}{%
\renewcommand{\rmdefault}{ugm}\normalfont%
}

\newcommand{\ungaramond}{%
\renewcommand{\rmdefault}{\rmdefault@garamond}\normalfont%
}
\end{filecontents}

```

1. Introduction

If you try `{\heading1 1.Introduction}` that will NOT work.

MATH MACROS

- (1) f^{-1} is better than f^{-1} .
- (2) $f: A \rightarrow B$ is better than $f : A \rightarrow B$.
- (3) $f \circ g$ is better than $f \circ g$.
- (4) \mathbb{C}^2 and \mathbb{R}^3 and $\nabla f(x)$

```

\newcommand{\toarrow }{\hspace{-4pt}\to \hspace{-3pt }}

\newcommand{\suchthat }{\hspace{-4pt} : \hspace{-2pt }}

\newcommand{\smallcircle}{ {\scriptstyle \circ } }
\newcommand{\of}{ \hspace{-1pt} \smallcircle \hspace{-1pt} }

\newcommand{\C}{\mathbb{C}}
\newcommand{\R}{\mathbb{R}} %For real numbers
\newcommand{\grad}{\nabla}

% For margin comments in small font
\newcommand{\marginlabel}[1]
  {\mbox{} \marginpar{\raggedleft \hspace{0pt} #1}}
\newcommand{\marg}[1]
  {\mbox{} \marginpar{\tiny \hspace{0pt} #1}}
\newcommand{\numeq}[1]{\begin{align}\begin{split} #1
\end{split}\end{align}}

```

is a
nal
ent.
quite
ng one,
it?

- (1) $f^{\scriptscriptstyle -1}$ is better than f^{-1} .
- (2) $f \text{ suchthat } A \rightarrow B$ is better than $f : A \rightarrow B$.
- (3) $f \text{ of } g$ is better than $f \circ g$.
- (4) C^2 and R^3 and $\text{grad } f(x)$ \marg{Here is a marginal comment. It is quite a long

TYPESETTING PAGES AND BOOKS

<http://www.economics.utoronto.ca/osborne/latex/PMAKEUP.HTM> has notes on page makeup by TeX author Martin J. Osborne

Something important to keep in mind in using Latex is that it is designed for professional typesetters typesetting books, not for scholars writing papers. This means that its code aims at a good-looking, readable, final product, not good-looking, readable input code. Not being WYSIWYG is the result of this. I actually prefer that as a scholar. It means that I can be sloppy about spacing when I type in text and formulas, and I can cut-and-paste with ease. But it means that anything requiring labelling is hard to read in the code. The identity of Section 3, equation (10), and Figure 4a keeps changing. It is much clearer to assign.

FIGURES AND YOUR OWN COUNTERS

How do we make figures not go at the top of a page, but rather next to where they are referenced? Don't use the `begin figure end figure` environment. Instead typeset the figures yourself, and use your own counter.

Unfortunately, figures tend to float anyway.

The following creates the new counter named `figurecounter` and starts it at 0. It immediately is stepped up to 1, and the label `fig11` is associated with 1.

- (1) "I will use Figure 1"
- (2) ' 'I will use Figure 2 ' '

This was generated by:

```
\newcounter{figurecounter}
\setcounter{figurecounter}{0}
\refstepcounter{figurecounter} \label{fig11}
```

- (1) ' 'I will use Figure \ref{fig11} ' '

```
\refstepcounter{figurecounter} \label{fig22}
```

(2) ‘ ‘I will use Figure \ref{fig22} ’ ’

PDF and LATEX

PDF: Foxit Reader. . When I process inLatex, I can process and produce a new PDF even while the old one is open. I then need to close it in Foxit and reopen it to see th enew one, though– there is no RELOAD command.

MICROSOFT WORD and LATEX and PDF

Acrobat 9 pro will convert PDF to WORD, so I can do everything in latex and convert later.

FONTS

<http://www.tug.org/fonts/special-s.pdf>

<http://www.tug.dk/FontCatalogue/mathfonts.html> "Fonts with Math Support" and other fonts too.

Seventh Circuit: <http://www.ca7.uscourts.gov/Rules/type.pdf>

Mathpazo, New Century, Palatino, Garamond are all good. The palatino font used in Mathpazo has stupid quotation marks that are like double primes and do not distinguish between starting and ending quotation marks. So Garamond is better. Lmodern is pretty good too (Latin Modern).

See <http://gael-varoquaux.info/computers/garamond/index.html>

To use the command `\garamond`, make sure garamond fonts are in a folder in the same directory as this main *.tex file, and that the file `garamond.sty` is in the same directory as the main *.tex file (NOT just in the font directory). Garamond is btter than mathpazo or palatino because it has true quotation marks. Also, put the following commands before BEGIN DOCUMENT:

```
\usepackage[T1]{fontenc}
\usepackage{lmodern}
\usepackage{garamond}
```

Then to use `garamond`, do this:

`\garamond`

This text is in Garamond font.

`\ungaramond`

This text is in Computer Modern

FONTS

Latex has some very impressive calligraphy and cursive fonts at:

<http://www.tug.dk/FontCatalogue/calligraphicalfonts.html>

AREV is a good font for overheads. I don't like beamer; just use ordinary latex. Then you can reveal the slides slowly in a simple way. `xxxusepackage[T1]fontenc xxxusepackagearev`

Use `\stackrel{def}{=}` instead of \equiv , so it is $x \stackrel{\text{def}}{=} y$.

$$x \equiv y \quad x \stackrel{\text{def}}{=} y$$

Use `\newcommand{\eqbydefinition}{\rm \stackrel{def}{=}}` instead of `\equiv`,

so it is `\eqbydefinition`.

`$$`

`x \equiv y \quad \quad x \stackrel{\text{def}}{=} y`

`$$`

To MAke text all cpaital letters: 3. A MODEL WITH THE SOCIAL PLANNER AS PROSECUTOR

ENDNOTE: This package does not work with the package that makes `sdfdsf` commands, so you need to replace all underscores with `_`.

DOUBLE SPACING

Use package `setspace`

OR, if you don't want to doublespace footnotes, tables, etc. TRY:

p. 144. p. 168 TeXBook INTEGRALS

$$\int_0^\pi \int_0^\pi \int_0^\pi \sum_{n=1}^9 \sum_{n=1}^9 \sum_{n=1}^9$$

$$\int_0^\pi f(x)dx \quad \int_0^\pi f(x) dx$$

$$\frac{52!}{12!40!} \quad \frac{52!}{12! 30! 10!}$$

$$\sqrt{2}x \quad \sqrt{2} x$$

$$\sqrt{\log x} \quad \sqrt{\log x}$$

$$x^2/2 \quad x^2/2$$

$$n/\log n \quad n/\log n$$

$$\Gamma_2 + \Delta^2 \quad \Gamma_2 + \Delta^2$$

$$\int \int_D dx dy \quad \iint_D dx dy$$

FROM THE TEXBOOK, JANUARY 7

INTPUT FILE APPEARANCE

Replace the default space command with the equivalent .

There should be some space in the middle of this sentence.

SLANTS AND ITALICS

p. 13 of The TeXBook: *This is slanted Roman typeface.*

p. 14 of The TeXBook: The slant of italic supposedly creates problems if there is a switch back to roman. Therefore, Knuth suggests we put a new control sequence in at the transition back point, like this:

I am switching from italics to roman. If I do it *this way* it does not work as well, he thinks, but I think it is better. On the other hand: (The trick is perhaps helpful *for punctuation.*) (Otherwise we *get this.*) But both look the same to me in this last example.

QUOTES WITHIN QUOTES

He said, “She replied, ‘I will go home’ ”.

versus

He said, “She replied, ‘I will go home’ ”.

CALLIGRAPHIC LAGRANGIAN LETTERS

\mathcal{L} versus \mathcal{L} . Both of these look the same.

p. 32. Type H at an error message, or look in the log file, to get an expanded error message.

p. 73, 91. To avoid line breaks, insert a tilde like this: Mr Rasmusen.

p. 74. If you don't want to have extra spaces after periods and other punctuations, use frenchspacing. It would look like: this. No extra space. No, it doesn't seem to work.

p. 94. Here is a way to have one output line per input line without putting after each line. Somehow it put blanks in between, though.

This is one line.

This is one line.

This is one line.

This is one line.

DOUBLE SUPERSCRIFT

Here is how to do one: x^{y^2} . We can have an empty subscript or superscript too: ${}_3$ and superscript .

GETTING SQUARE ROOTS TO LINE UP

p. 131. What is worse is $\sqrt{x} + \sqrt{y} + \sqrt{d}$ because the y dips down and the d goes up. What is better is $\sqrt{x + \sqrt{y} + \sqrt{d}}$. The mathstrut is a box.

Maybe just redefine the commands that are always too narrow:

```
\renewcommand{\hat}{\widehat}
```

p. 135. Variables \check{x} and \acute{x} and \ddot{x} and \tilde{x} and \hat{x} and \check{x} . For overlining, \bar{x} is a line of flexible length, whereas \overline{x} is always short.

□ and ◻ and ●

p. 135. For double overlines and hats, try this: $\overline{\overline{x}}$ or $\widehat{\widehat{x}}$

p. 135. It's a good idea to makes lots of macros for common notation, e.g.???

p. 142. To keep bits of fractions from being too small, use struts. Compare

$$(1) \quad a_0 + \frac{1}{\frac{1}{a_1 + \frac{1}{a_2 + \frac{1}{a_r}}}}$$

and

$$(2) \quad a_0 + \frac{1}{\frac{1}{a_1 + \frac{1}{a_2 + \frac{1}{a_r}}}}$$

p. 143. Fractionlike things:

$$(3) \quad \frac{x}{y+2}$$

$$(4) \quad \left(\frac{x}{y+2} \right)$$

$$\frac{\frac{x}{y+2}}{\frac{a}{b}}$$

$$\frac{\frac{x}{y+2}}{\frac{a}{b}}$$

p. 147. TeXBook. DELIMITERS

((((

p. 147. TeXBoo EXTRA SPACE IN CONDITIONALS

TeX does conditionals like this:

$$Prob(x|y) = .56$$

That is better than closing up with negative space, but sometimes tex does put in too much space.

$$\text{Prob}(xy) = .56$$

NEGATIVE SPACE

p. 166. TWO FORMULAS ON ONE LINE

$$f(x) = 3x^2 \quad n \geq 15$$

LIMITS AND MAXIMIZATION

p. 145 TexBook. DOUBLE INDEXES FOR SUMS

$$\sum_{\substack{0 \leq i \leq M \\ 0 \leq j \leq N}} P(i, j)$$

p. 162. TexBook

$$\Pr_{y \rightarrow 0}(g(y) < 5) = \exp 2 + \log(x) - \max_{1 \leq a \leq B}(a, x) + \lim_{x \rightarrow \infty} g(x)$$

The supposed LiMIT and MAX command are a cheat. They just write Lim or Max and then subscript with the arrow or whatever.

$$\lim_{x \rightarrow \infty} f(x) = 0$$

$$\max_{0 \leq x \leq 1} x(1-x) = 1/4$$

Instead use stackrel, like this:

$$\lim_{x \rightarrow \infty} f(x) = 534z + \frac{3}{y}$$

and like $\max_x x(1-x)$, for maximization.

I should probably make those into macros, since they take so many commands.

```
\define \limminmax{arg1}{arg2} = \stackrel{\displaystyle arg1}{\scriptscriptstyle arg2}
```

p. 145 TexBook. DOUBLE INDEXES FOR SUMS

```
$$
\sum_{\scriptstyle 0 \leq i \leq M \atop \scriptstyle 0 \leq j \leq N} P(i,j)
$$
```

p. 162. TexBook

```
$$
\Pr_{y \to 0}(g(y) < 5) = \exp 2 + \log (x) - \max_{1 \leq a \leq B}
(a,x) + \lim_{x \to \infty} g(x)
$$
```

The supposed `LiMIT` and `MAX` command are a cheat. They just write `Lim` or `Max` and then subscript with the arrow or whatever.

```
$$\lim_{x \to \infty} f(x)=0$
```

```
$$\max_{0 \le x \le 1} x(1-x)=1/4$
```

Instead use `stackrel`, like this:

```
$$
\stackrel{\rm \displaystyle \lim}{\scriptscriptstyle x \to \infty}
f(x) = 534z + \frac{3}{y}
$$
```

and like

```
$$\stackrel{\rm \displaystyle \max}{\scriptstyle x} x(1-x) $, for
maximization.
```

I should probably make those into macros, since they take so many commands.

This is my bold β , or you can do it like this

β is bold but not β

Or try this `boldsymbol` method:

$\mathbf{5}x \neq 5x$ $\boldsymbol{\theta}y \neq \theta y$

A dash has three marks like— this.

A hyphen has two marks quasi-linked like that.

\bar{a} \breve{a}

$$\overbrace{a + b + \dots + z} \quad \underbrace{a + b + \dots + z}$$

$$f(x) \stackrel{\text{def}}{=} x^2 - 3$$

ROMAN TEXT INSIDE MATH

Use mbox like this:

$$x = y \text{ if and only if } z = 90$$

`\indicatess\where\blanks\are.\ \Here\is`

`\A\dash\has\three\marks\like---\this.`

`\A\hyphen\has\two\marks\quasi--linked\like\that.`

`\hrule`

`$$
\bar{a}\;\;\;\breve{a}
$$`

`$$
\overbrace{a+b+\dots+z}\;\;\;\;\;\underbrace{a+b+\dots+z}
$$`

`\hrule`

`$$
f(x)\overset{\rm def}{=}x^2-3
$$`

`\hrule`

ROMAN TEXT INSIDE MATH

Use `\mbox` like this:

\$\$

`x=y\;` `\mbox{if and only if}` `z=90`

\$\$

`\hrule`

VERBATIM

`indicates where blanks are. Here is`

`some text. ***$$$$`

FOOTNOTES INSIDE TABLES AND MATH

Use the `footnotemark` command to insert the footnote number. To insert the footnote itself, use

$$x = y^1$$

lattice	d	q	last column ²
square	2	4	1.763

DECIMAL POINTS

The following input: 3.14159
 16.2
 123.456

`*a*a*a*a*a*a*a*a*a*a*a*a*a*a*a*a*a*`

Here is a table with partial `hrule`, not going all the way across, and partial `vrules` too.

⁰Except when $x = 8$.
¹ That's two words in that entry.

Radon

Unexposed

Cancer	$\theta P(\text{cancer} \text{radon}) \cdot n(\text{radon})$	$\theta P(\text{cancer} \text{unexposed}) \cdot n(\text{unexposed})$
Healthy	$\gamma P(\text{healthy} \text{radon}) \cdot n(\text{radon})$	$\gamma P(\text{healthy} \text{unexposed}) \cdot n(\text{unexposed})$

@

There are three ways to do comments in Latex.

1. There is a comment hidden on this line.
2. There is a multiline comment hidden on the next lines using a command from the verbatim package I inserted at the start of this file.
3. There is a comment hidden here, just after the comma, using the new comments command I create at the start of this file.

He had submitted a bid ceiling of \$2,100 for a custom-made analog stereo amplifier, and the highest anybody else had submitted was \$1,400, so he was sure to win. disaster struck.

text that I want to box, such as a game description, goes here.

He had submitted a bid ceiling of \$2,100 for a custom-made analog stereo amplifier, and the highest anybody else had submitted was \$1,400, so he was sure to win. disaster struck.

$$\underset{x}{\text{Maximize}} x^2 - x \text{ or } \underset{x}{\text{Maximize}} x^2 - x$$

$$\begin{aligned} \pi_1^d &= -c + \int_0^{Eu} \left(\int_v^z (u-v)f(u)du \right) g(v) + \int_{Eu}^v \left(\int_v^z (u-v)f(u)du \right) g(v)dv. \\ (5) \quad &= -c + A_1 + A_2. \quad \left\{ \sum_{i=1}^3 x_i \left(\left(\left(\left(\right) \right) \right) \right) \right. \end{aligned}$$

Equation (5) is nonsense. But so are (6) and (7).

$$(6) \quad F(x) = 3x^2$$

$$(7) \quad = 4z$$

(8)

$$\pi_i = \begin{cases} V - x_i & \text{if } T(x_i) < \text{Min}\{T(x_j), T(x_k)\} \quad (\text{Firm } i \text{ gets the patent}) \\ \frac{V}{2} - x_i & \text{if } T(x_i) = \text{Min}\{T(x_j), T(x_k)\} \quad (\text{Firm } i \text{ shares the patent}) \end{cases}$$

$$\max_x x(1-x) \qquad (1-35) \quad \bar{x}, \ddot{x}$$

$$\lim_{x \rightarrow \infty} f(x) \quad \int_0^{\infty} x f(x) dx, \quad \text{not}, \quad \int_0^{\infty} x f(x) dx,$$

The two standard ways are the overline, \bar{U}_i , and the bar, \bar{U}_i . Try this: \bar{U} or try this: \bar{U} . Here is $\widetilde{12345}$ Or \sim sometimes. \sim -sped is for a high tilde. For $\tilde{\text{Tilde}}$ in text. Put \blacksquare at the end of the proof.¹ How to make x_i^i different from x_j^j . Use X_i^j and X_j^i

This also restarts the numbering to 1. Do you know that a table in on page 2?

Here is

some

Unformatted

text with & \ \ #

Variable	Minimum	25th percentile	Median	Mean	75th percentile	Maximum
Crimerate	0.56	3.48	5.36	5.97	7.76	22.08
Murderfraction	0.00	0.00	0.00	0.36	0.58	2.50
Pop	1.16	16.76	40.27	116.82	98.72	9329.99

undo the commenting to get the figure inserted.

Figure 2: Some Stuff

Table 11: IMF Aid

		Debtor	
		Reform	Waste
IMF	Aid	3,2	-1,3
	No Aid	-1,1	0,0

Payoffs to: (IMF, Debtor).

10pt Default 11pt Option 12pt Option

5pt 6pt 6pt

7pt 8pt 8pt

8pt 9pt 10pt

9pt 10pt 11pt

10pt 11pt 12pt

12pt 12pt 14pt

14pt 14pt 17pt

17pt 17pt 20pt

20pt 20pt 25pt

25pt 25pt 25pt

$$y = x^2 + \pi, y = x^2 + \pi, y=x^2+\pi, y=x^2+\pi$$

Left side text

right side

Left side textright side

right side

Here's is one[‡] and here is a second.[§]Here is a third.[¶]

To do asterisk footnotes, do this:*

List of Figures

List of Tables

1	The World in 1812	iv
---	-----------------------------	----

Oranges: a fruit that Amelia likes a lot, just as she likes grapes and pickles.

Lettuce: something Amelia does not like.

This is the first line of a poem

Here is the second, hwich is so long that it runs over on to the next line, where
it will be indented.

And here is the third.

The command @ kills the space between columns in a table and replaces it with whatever is in curly brackets. It can be used to cleverly align tables around decimal points, thus:

The table is on page iv.

one	be	due to	differences,
one	to	reputation	the sort

$$\begin{aligned}
 &De(s) &&= 0 && \text{if } s < p \\
 &Pr(s) = \frac{(1)g(p)}{g(p)+m(p)[1-G(s^*)]} = \frac{g(p)}{g(p)+\frac{g(p)}{G(\bar{p}_h)}[1-G(s^*)]} = \frac{G(\bar{p}_h)}{1-[G(s^*)-G(\bar{p}_h)]} && \text{if } s = p \\
 (9) &De(s) &&= 0 && \text{if } s \in (p, s^*) \\
 &De(s) = \frac{m(p)g(s)}{g(p)+m(p)[1-G(s^*)]} = \frac{\frac{g(p)}{G(\bar{p}_h)}g(s)}{g(p)+\frac{g(p)}{G(\bar{p}_h)}[1-G(s^*)]} = \frac{g(s)}{1-[G(s^*)-G(\bar{p}_h)]} && \text{if } s \geq s^*
 \end{aligned}$$

Notes

¹Here it is.

December 10, 2008/Augut 1, 2009.

What is below is from

‡starred note

§ Daggered footnote

¶The third footnote.

¶* Here is the footnote.

Variable	Mean.
X	1.234
Y	23.1
Z	1456.34567

Table 1: The World in 1812

The World...

latex-rasmusen.txt

SCIENTIFIC WORKPLACE

Here's what to do to convert a SWP-made file into one that regular latex can process:

1. Delete the line `\input{tcilatex}` which I think Scientific Workplace will put back in for you automatically when you load it.
2. Change `\frame{` to `{\tt`, which will result in a line of nonsense where each figure was, but will allow latex to process the file without trouble.

PICTURES

Latex actually makes pretty good pictures. Here is how to make a 200x100 mm picture, with 0,0 as its base point, and a line sloping up in direction (1,1) and 50mm long starting at (0,0):

```
\begin{picture}(200,100)(0,0)

\put(0,0) {\line (1,1){50}}

\end{picture}
```

BOLD MATH

LaTeX ignores the `\bf` in stuff like $\{\bf \beta\}$, but has `\boldmath` to get around this. Unfortunately, it only works in text-mode, not math-mode. But you can get around this by defining a new command for each symbol you want boldfaced:

```
\newcommand{\bbeta}{\mbox{\boldmath$\beta$}}
```

This is my bold β , or you can do it like this

\$\$

β ; is; bold; but; not; β

\$\$

Or try this `\boldsymbol` method:

\$\$

$\boldsymbol{5x} \neq 5x$; $\boldsymbol{\theta} y \neq \theta y$

\$\$

ROMAN TEXT INSIDE MATH

Use `\mbox` like this:

\$\$

$x=y$; $\mbox{if and only if}$; $z=90$

\$\$

\$\$

\bar{a} ; \breve{a}

\$\$

\$\$

$\overbrace{a + b + \dots + z}$; $\underbrace{a + b + \dots + z}$

\$\$

\$\$

$f(x) \overset{\text{def}}{=} x^2 - 3$

\$\$

`\begin{table}` does tables as floats, trying to go at the top or bottom of pages. `\begin{tabular}` puts them wherever they happen to be, skipping everything and going to the next page if there isn't room and just leaving blank space behind. Thus, `\begin{table}` is better. It is an EXTRA command, though. You still need to use `TABULAR` too, like this:

```
\begin{table} \begin{tabular} {ll}
```

```
  First & Second & Third\\
```

```
A new row & Has\footnotemark & New text\\
\end{tabular}\end{table}
```

VERBATIM

```
\begin{verbatim*} indicates where blanks are.
```

FOOTNOTES INSIDE TABLES AND MATH

Use the `\footnotemark` command to insert the footnote number. To insert the footnote itself, use

```
\addtocounter{footnote}{-1}\footnotetext{Here is my footnote}
\stepcounter{footnote}
```

outside the table or math but trying to be on the same page.

\$\$

```
x = y\footnotemark
```

\$\$

```
\addtocounter{footnote}{-1}\footnotetext{Except when $ x= 8$. }
\stepcounter{footnote}
```

```
\begin{tabular}{|l|l|r|l|}
\hline
lattice &  $d$  &  $q$  & last column\footnotemark \\
\hline
square & 2 & 4 & 1.763 \\
\hline
\end{tabular}
```

```
\addtocounter{footnote}{-1}\footnotetext{ That's two words in that
entry.  }
\stepcounter{footnote}
```

@@*@*@*@*@*@*@*@*@*@*@*@*@*@*@*@*@*@*

DEFINING YOUR OWN COUNTERS AND LABELS.

This is tricky in Latex, because while you can define new counters, I can't see how you would attach their values to labels. The `\label` command can only be used in environments that have their own counters (such as `\begin{equation}`), and you can't fool those environments into adding to a counter without having them print the value on the printed page somewhere. So I used Tex programming, like this. I create a new counter named `\fignum` and then attach it to a label called `\1f`, `\2f`, and so forth, advancing the counter in between. I used `\edef` rather than `\def` because `\edef` inserts the value at the particular time, while `\def` would repeat the command `\number\fignum` each time `\1f` was written.

```
\newcount\fignum\fignum=1
```

```
\edef\1f{\number\fignum}
```

```
\advance\fignum by 1
```

```
\edef\2f{\number\fignum}
```

Example: Figure `\1f` says this. The second part of it, Figure `\1fa`, says something different. Figures `\2f` and `\2f-a` say something still different.

This is plain Tex, not Latex.

You need to write `backslash-1-f` rather than `backslash-f-1`. I'm not sure why-- it must be that the number gets interpreted as doing something special to the definition rather than being part of the name.

You have to remember to put your definitions earlier in the document than when you use the term defined. You could put them all the start, actually, but then you might forget to re-order them when you change

the order of the diagrams.

I think you can advance the fignum variable by a negative number if you want to.

BIBTEX.

I'm not sure if this is worth using or not. Here's how it works with Miktex.

1. For your file myfile.tex, construct a bibliography database file myfile.bib with a bunch of entries like this, which do not have to be in alphabetical order:

```
@article{hotelling:1929:ej,  
  author = {Hotelling, Harold},  
  journal = {Economic Journal},  
  month = {mar},  
  number = {153},  
  pages = {41--57},  
  publisher = {Royal Economic Society},  
  title = {Stability in Competition},  
  volume = {39},  
  year = {1929}  
}
```

You can do this from Google Scholar by going to Scholar Preferences and checking off towards the bottom that you want a Bibtex-format link. After you set your preferences, Import into BibTeX will be a link for each item a Google Scholar search turns up.

2. Pick a style file such as econometrica.bst. Put that file and the myfile.bib file into the same directory as myfile.tex.

3. Wherever you want the references in myfile.tex, insert the commands

```
\bibliographystyle{econometrica} %needs econometrica.bst file in  
folder  
\bibliography{myfile} %needs myfile.bib file in folder  
  
\nocite{*}
```

The nocite command makes sure that all the entries in the myfile.bib file get put into the references. Otherwise, only the ones cited using bibtex commands get put in. The bibtex citing commands are just extra commands to remember and make reading latex input files harder, so I don't think I'll use them.

4. Change the name of myfile.tex to plain myfile.
5. Run myfile through pdflatex. That will create myfile.aux.
6. Run myfile through bibtex. That will use myfile.aux and econometrica.bst and myfile.bib to create myfile.blg, a log file, and also myfile.bbl, the bibliography formatted nicely.
7. Run myfile through pdflatex again.

DATES

Put the last revision date of a paper on manually, e.g. May 20, 1998.

Also, put the commands "pdf'd \today".

\BEGIN{CASES} FOR EQUATIONS WITH SEVERAL CASES:

This will be useful. It puts a big curly bracket after the equals sign to enclose the various cases that can occur. You need to have `xxxusepackage{amsmath, amssymb}`

```
\begin{equation*}
|x|=
\begin{cases} x & \text{if } x=0, \\
\\
-x & \text{if } x \le 0. \end{cases}
\end{cases}
\end{equation*}
```

Here is a table with partial hrule, using the cline command across columns 2 and 3, not going all the way across, and partial vrules too.

```
\begin{tabular} {lcc}
& Radon & Unexposed & \\
& & & \\
& & & \end{tabular}
```

```

\cline{2-3}
& \multicolumn{1}{|c|}{ } & \multicolumn{1}{|c|}{ } \\
Cancer &\multicolumn{1}{|c|}{\$ \theta P(cancer|radon) \cdot n(radon)
\$}
&\multicolumn{1}{|c|}{\$ \theta P(cancer|unexposed) \cdot
n(unexposed) $ } \\
& \multicolumn{1}{|c|}{ } & \multicolumn{1}{|c|}{ } \\
\cline{2-3}
& \multicolumn{1}{|c|}{ } & \multicolumn{1}{|c|}{ } \\
Healthy &\multicolumn{1}{|c|}{\$ \gamma P(healthy|radon)\cdot n(radon) $
} &\multicolumn{1}{|c|}{\$ \gamma P(healthy|unexposed) \cdot
\cdot n(unexposed) $ } \\
& \multicolumn{1}{|c|}{ } & \multicolumn{1}{|c|}{ } \\
\cline{2-3}
\end{tabular}

```

COMMENTS.

There are three ways to do comments in Latex.

1. The standard way to do comments puts in % and then everything on the line after it is commented out:

First I have some input, like $y = x^2 + \beta$. %Here is a comment.

2. If you put `\usepackage{verbatim}` at the start of your file, you can do multiline comments like this:

```

\begin{comment}
  Here is the first line of the comment.
  Here is the second line.
  Here is the third.
\end{comment}

```

3. If you put `\newcommand{\comments}[1]{}` at the start of your file, you can have the best way of all:

Say $y = x^2 + \beta$. `\comments{Here is my comment. }` Maybe $x = 4\phi$.

Note that if you use `\usepackage{verbatim}`, it creates an odd command that makes everything after it in the file a comment. Suppose you write:

```

\comment{Here is what I wanted to be my comment.} Here is some more
writing for my paper.

```

Then not only will the words in the brackets be a comment, but all the

words after the brackets and on the next lines and pages too.

SPECIAL EQUATION NUMBERING

CURRENT WAY: Put a star after the equation command to suppress numbering, like `\begin{equation*}... \end{equation*}`. Whether or not you do that, you can put `\tag{A1}` on a particular line to make it label as equation (A1) (It adds the parentheses automatically); or `\notag` so there is no equation number displayed. To add a label that you can refer to later, put in `\label{A1}`. Then later you can refer to it as equation `\eqref{A1}`, which comes out as "equation (A1)". Note that `\eqref` puts in the parentheses automatically; `\ref` does not.

`\align` replaces `\array`, they say.

HERE IS AN OLD WAY To put in your own equation number (1-35), without changing the standard ordering, do this, putting the command at the end of your equation (after the `\end{array}` if it is an array). Remember to use `$$`, not `\begin{equation}`.

```
$$ \label{e1-35}
   f(x) = x^2+34 \eqno{(1-35)}
$$
```

```
\usepackage{hyperref}
\hypersetup{breaklinks=true,
pagecolor=white,
colorlinks=true,
linkcolor= blue,
hyperfootnotes= true,
urlcolor=blue
}
```

```
\urlstyle{rm}
%so it doesn't use a typewriter font for url's.
```

```
\url{
http://ihome.ust.hk/~tanjim/verylongaddresslikethisone-111111zxzxzxzx
zxzx
zxzxsqut_high.pdf}
```

This will use the package hyperref, and turn the address in `\url{sdfd}` into a link, as well as displaying `sdfd` in the text in color (which will look grey when printed). Also, it will split the address sensibly across lines. The web address can include tilde and underscore without special control characters, which is not usual in tex. Also, references to footnotes, pages, and to equations and other `\ref{sdf}` will be links to the original equations. If want a reference to use the correct counter but not to create a link use `\ref*{label}` or `\pageref*{label}`.

The manual for hyperref is at:

<http://www.tug.org/applications/hyperref/manual.html#x1-90003.5>

`\url{sdfd}` is a separate macro though, which I think can work even if you don't use hyperref (but you want to split up across lines sensibly, and be able to use underscore and tildes).

VARIOUS LITTLE COMMANDS

`\pagenumbering{roman}` This also restarts the numbering to 1.

`\not\exists` for an exists symbol with a slash through it.

A special little extra space is proper for integrals, like this:

```
$$
\int_0^{\infty} x f(x)\,dx,\;\;\;\; \text{not,}\;\;\;\; \int_0^{\infty} x f(x)dx,
$$
```

To put the limits of the integral above and below the integral sign, rather than at the sides of the top and bottom, say

```
$$
\int\limits_0^1
$$
```

I should use notation like \dot{x} and \ddot{x} sometimes.

`\dotfill` for a long line of dots.

UNDERSCORE, UNDERLINE _ is ok, no math \$\$ needed.

```
\begin{verbatim}
```

REFERENCE LISTS GOING OVER SEVERAL PAGES

For reference lists, use

Rasmusen, Eric (1980) *A Book*.

That will generate a list with the first word (Rasmusen) off to the left a bit and the rest indented from it.

If I have a long document, sometimes long multipage lists go crazy in latex and won't put in a pagebreak at the right spot. The solution is to break off the list as a separate document, say, list1.tex. Use to start it at page 522. If there are labels such as page numbers that are needed, they will be in a *.aux file in the main document. Copy that *.aux file to the preamble, before begindocument, of the list1.tex document.

INDEXING

To tag index main entries, i.e. if the work 'Likelihood' tag as next to that word.

For index subentries, use an exclamation point and tag as:

"In some respects the Bayesian formulation is the simpler and in other respects the more difficult."

Put these commands at the start: xxx usepackage makeidx xxx makeindex

Then use the *.idx file that is created

```
xxxindexentry words!and|hyperpage1 xxxindexentry existing|hyperpage1
```

to generate something like this:

```
xxxbegintheindex
```

```
xxxitemextendxxxhfill3 xxxitemextension problemxxxhfill3 xxxitemextension of a mapxxxhfill3
```

```
xxxitemhomotopicxxxhfill5 xxxitemhomotopyxxxhfill5
```

```
xxxendtheindex
```

I have an examples of tex input and pdf output, with different and better instructions, at <http://www.rasmusen.org/a/sample-index.tex> and <http://www.rasmusen.org/a/sample-index.pdf>

A good reference is:

“MakeIndex: An Index Processor For LaTeX” by Leslie Lamport 17 February 1987
<http://tex.loria.fr/bibdex/makeindex.pdf>

Here is an example of how to create an italicized index entry. This puts the entry “xxxit Producers– The” at the location “producers” would have in the index.

The next game, inspired by Mel Brooks’s offbeat film xxxit The Producers xxxindexproducers@xxxit Producers– The, illustrates a peculiarity of optimal contracts

My second way to do indexes, the less intelligent way (because it will repeat page numbers if more than one xxxlabel is on one page, and it won’t alphabetize) is to just put xxxlabel-termtindex in the text, and xxxpagereftermtindex in the index. Check to see if a label is assigned more than once, by mistake. To do that, you can look at the latex processing log in *.log, or you can look at the *.aux file and it will list all the page numbers assigned to a label.

SHADED TABLES:

```
xxxusepackage[table,x11names,svgnames]xcolor
```

```
xxxrowcolors2black!10black!5
```

```
xxxbegin tabular | llllll xxxhline xxxrowcolorblack!25 Variable zzz Minimum zzz 25th percentile zzz Median zzz Mean zzz 75th percentile zzz Maximumxxxxxxx xxxhline xxxhline Crimerate zzz 0.56 zzz 3.48 zzz 5.36 zzz 5.97 zzz 7.76 zzz 22.08xxxxxxx Murderfraction zzz 0.00 zzz 0.00 zzz 0.00 zzz 0.36zzz 0.58 zzz2.50xxxxxxx Pop zzz 1.16 zzz 16.76 zzz 40.27 zzz 116.82 zzz 98.72 zzz9329.99xxxxxxx xxxhline xxxend tabular
```

HYPERLINKS FROM PDFs

```
usepackage[bookmarks=true,bookmarksopen=true,colorlinks= true,urlcolor= red!60!black,linkcolor=blue!80,pagebreak=page]hyperref
```

```
xxxhrefmailto:erasmuse@indiana.edu
```

```
xxxurlhttp://www.rasmusen.org
```

DIAGRAMS-FIGURES

Diagrams: use alt-PRINT SCREEN to do a screen capture and use PAINT to make a JPG. Or, use powerpoint, and SAVE AS a jpg file.

In miktex, diagrams are simple. Just insert:

```
xxxbeginfigure xxxcentering xxxincludegraphics[width=80mm]options2.jpg xxxcaptionFigure 2: Pointwise and Extremum Riskiness xxxendfigure
```

or even just

```
xxxincludegraphics[width=80mm]options2.jpg
```

To get the caption not to automatically number, use:

```
usepackageccaption xxxcaptiondelimxxxrenewcommandxxxthefigure xxxrenewcommandxxxfigurename
```

The following is useful to get figures put on the same page with text instead of off on their own pages.

```
xxxrenewcommandxxxfloatpagefraction.9 xxxrenewcommandxxxfracfraction.9 xxxrenewcommandxxxbottomfraction.9 xxxrenewcommandxxxtextfraction.1 xxxsetcountertotalnumber50 xxxsetcountertopnumber50 xxxsetcounterbottomnumber50
```

Be wary of using pdf's instead of jpg's. If a pdf is cropped, soemtimes it is not truly cropped-and all the white space does show up in the tex file.

POWERPOINT

<http://www.ecs.soton.ac.uk/~srg/softwaretools/presentation/TeX4PPT/> This is the best of the two tex powerpoint programs. Free, and easy to install. Needs Powerpoint 2002.

INTEGRALS AND PRODUCTS AND SUMMATIONS IN FRACTIONS

Q: If I use a xxxprod or xxxint within a xxxfrac{}{} they end up very small with the sub/superscripts alongside rather than above or below.

Answer:

```
xxxfrac{xxxdisplaystyle xxxint_a^b dx f(x)}{xxxdisplaystyle xxxprod_{i=1}^{xxxinfty} a_i}
```

```
<A HREF=" http://www.cse.iitd.ernet.in/~anup/homepage/UNIX/latex.html ">"Some useful tips and tricks in LaTeX".</A>
```

More generally:

TILDES

FOR WIDE TILDE ON TOP OF SOMETHING: `xxxwidelatex{12345}`

FOR TILDE IN TEXT, NOT on top of something: `$xxxxsim$` . This is what to use in URL's.

`xxxtextasciitilde` is for a high tilde (no `dollarsign` needed). `$xxxxsim$` is for a midlevel tilde.

For Tilde in text, on top of the next letter: `xxx~`

PUTTING THINGS ON THE SAME PAGE (Does this really work?)

Put `xxxbegin{samepage}...xxxend{samepage}` around the whole mess.

```
<A HREF=" http://www.cse.iitd.ernet.in/~anup/homepage/UNIX/latex.html
">"Some useful tips and tricks in LaTeX".</A>
```

MAXIMIZING $F(X)$ BY CHOICE OF X

```
$$
  {Maximize xxxatop x } x^2-x
$$
```

```
$$
  {Maximize xxxatop xxxscriptstyle{x} } x^2-x
%Tthe scripstyle is too small, really.
$$
```

BRANCHING "IF" DEFINITIONS

Sometimes I want to use a big bracket to say $X=2$ if $Y<3$ but $X=5$ if

Y xxxgeq 3.

Here's the style for that:

```
xxxbegin{tabular}{ll}
  $ xxxpi_i = $zzz $xxxleftxxx{ xxxbegin{tabular}{lll}
    $V-x_i$ zzz if
  $T(x_i) < Minxxx{ T(x_j, T(x_k) xxx} $ zzz (Firm $i$ gets the patent)xxxxxx
  zzz zzz xxxxxx
  $xxxfrac{V}{2} - x_i$ zzz if $T(x_i) = Min xxx{T(x_j),T(x_k)xxx} $ zzz (Firm
  $i$ shares
  the patent
  xxxxxx
xxxend{tabular} xxxright.$xxxxxx
xxxend{tabular}
```

PROOF END SYMBOL

At the start, have:

```
usepackage{graphicx}
usepackage{amsmath}
xxxusepackage{amssymb}
```

Then put \blacksquare at the end of the proof.

FORMAT FOR A TWO-BY-TWO GAME

```
xxxbegin{center} {xxxbf Table 11: IMF Aid }
```

```
xxxbegin{tabular}{lllccc} zzz          zzz
zzzxxxmulticolumn{3}{c}{xxxbf Debtor}xxxxxx
zzz      zzz      zzz Reform  zzz      zzz      Waste xxxxxx
zzz zzz Aid      zzz      3,2   zzz      zzz      -1,3 xxxxxx
zzz {xxxbf IMF}  zzz          zzz      zzz      zzz      xxxxxx
zzz zzz No Aid  zzz -1,1      zzz      zzz      0,0 xxxxxx
zzz      zzz          zzz      zzz      zzz      xxxxxx
xxxmulticolumn{6}{l}{xxxit Payoffs to: (IMF, Debtor).}xxxxxx
xxxend{tabular}xxxxxx
xxxend{center}
```

RAGGEDRIGHT, LEFT JUSTIFICATION

The tex default is to right- and left-justify the page, which looks very professional. I just read, though, that psychologists find this actually slows down reading compared to just left-justifying, because people are not used to the diverse spacing of letters and words that is required for uniform margins on both sides. Also, a raggedright looks better for working papers, I think.

The command for that is

```
xxxbegin{raggedright}
```

```
xxxparindent 24pt
```

```
xxxparskip 10pt
```

```
xxxend{raggedright}
```

You need to put the parindent and parskip commands AFTER the begin{raggedright}

PROCESSING TEX

The free Miktex (<http://www.miktex.org/>) looks to be an excellent latex and tex Windows processor program. I've been using SWP, and putting figures in looks to work better in Miktex. Miktex gets PDF's right, which my version of SWP does not always do, and it processes straight from myfile.tex to myfile.pdf. On the other hand, it has some problems, noted below, which make it unhandier to use.

I think I've found the best solution. In textpad, create a new TOOL in CONFIGURE-PREFERENCES. Choose ADD, then DOS COMMAND, then write `pdflatex \[extract_itex]file`

(1) I have a suggestion for the standard installation instructions: say more about the Windows command prompt. I haven't used it for years, though I happened to remember it was in Accessories. Also, the user should know that he can change the default directory in the command prompt to wherever he keeps his tex input files-- say, `d:/smith/latex-input`, using the Properties (reachable by right clicking the command prompt).

(2) The command prompt requires you to type in all your commands, which is burdensome if they are long, e.g.,

```
pdflatex D:
```

xxx_homexxx_HomeWDxxxINCOMINGxxxFIGURECOPY/myfilewithalongname.tex

You can't copy and paste in the usual way with CTRL-C and CTRL-V. What you can do, though is to copy to the clipboard with CTRL-C and then paste by rightclicking on the Command Prompt program and choosing PASTE.

I will put a comment line like this at the start of my tex files:

```
% pdflatex chap07_MoralHazard.tex
```

then I can copy all but the % part and paste it into the command prompt, and it will process chap07_MoralHazard.tex and write to chap07_MoralHazard.pdf

(3) Something better would be a graphic interface to replace the command prompt. I don't know how to write such an interface, but here is what it would be: It would be simple: just a window in which the user could do two things:

1. Browse and choose a tex file to process, e.g., myfilewithalongname.tex, instead of having to type in the full name in the command prompt, and instead of having to have it in the command prompt's directory.
2. Issue the processing command--- most simply "latex myfilewithalongname.tex", or "pdflatex", or others that might be useful. There should be two to five choices, and the user would check the box of the command he wants to use.

The command would take the file from (1) and put the output in the same directory as the input.

The interface could be fancier, but that covers what the user needs every single time he uses Miktex, and it would save a lot of tricky typing.

(4) Miktex is fouled up by carriage returns, even ones that are not hard breaks. Thus, before I tex my files using it I need to strip off all the carriage returns, thus making all my equations, nicely separated into separate lines for visibility, into unreadable paragraphs

With the help of Alan, I solved this problem. What I had to do was to save my file as DOS or UTF-8 instead of as ANSI.

SIZING

PRODUCTS

Use `xxxprod`, NOT `xxxPi`, with `{xxxdisplaystyle xxxprod_1^3}` if necessary.

THE LARGE CURLY BRACKET:

`xxxleftxxx{`

THE LARGE SUMMATION SIGN: Use `xxxsum`, NOT `xxxSigma`, with `{xxxdisplaystyle xxxsum_1^3}` if necessary.

For integrals, to get them in the large style in Arrays or in text use `{xxxdisplaystyle xxxint_0^1}`.

```
xxxbegin{array}{ll}
```

```
xxxpi_1^d zzz = {xxxdisplaystyle -c + xxxint_0^{Eu} xxxleft( xxxint_v^z (u-  
v)  
f(u) du xxxright) g(v) + xxxint_{Eu}^v xxxleft( xxxint_v^z( u-v) f(u) du  
xxxright) g(v)dv. }xxxxxx zzz xxxxxx  
zzz= -c + A_1 + A_2. xxxxxx  
xxxend{array}
```

To change size of any operator like `{ | } [] ()`, one need to use commands

```
xxxbig  
xxxBig  
xxxbigg  
xxxBigg
```

For example, `xxxbigg|` These command are in order of increasing size. This is especially good for `|`, since it can take superscripts and subscripts properly then, unlike with `xxxleft|`

EQUATION ARRAYS


```
documentclass[12pt,epsf,leqno, fleqn]{article}
```

This is for left equation numbering, and for not centering the equations but rather putting them towards the left at a fixed indent from the margin. documentclass is always better than documentstyle, because it permits packages to be used. Also, this does 12 pt type.

DOUBLE SPACING

```
xxxbaselineskip 24pt
```

This goes AFTER Begin Document.

```
xxxtopmargin -1.5in
```

DIFFERENT FONTS: But these do not reliably work.

```
{xxxxsf sans serif. Christianity depends ...}
```

```
{xxxtt typewriter. might occur. }
```

```
{xxxrm Roman. Christianity depends on ancient }
```

I like the palatino font better than Times New Roman. Here is a package that uses it, and which uses Helvetica for its sans serif font: xxxusepackage{mathpazo}

For cursive font, use the pbsi package and xxxtextbsi{ a command like this.}

```
usepackage[T1]{pbsi}
```

MATH FONTS

These are different from the others (LARGE, etc.)

xxxtextstyle - default in the running text and in array environment
xxxdisplaystyle - default for displayed equations
xxxscriptstyle - default for first-level sub and superscripts
xxxscriptscriptstyle - default for higher-level sub and
superscripts

"Left side text xxxhfill right side"

The hfill command is good for putting text on each side of a page.

" ~ xxxhfill right side"

The tilde ~ can be used for a space. "xxx;" works just as well. I think xxxquad or xxxxxxquad works better in math mode-- maybe it's intelligent and makes the space a nice-looking length.

FOOTNOTES WITH SYMBOLS

This will make the first footnote an asterisk and the second one a dagger, and then goes back to the default, numbers, starting with number 1.

```
xxxrenewcommand{xxxthefootnote}{xxxfnsymbol{footnote}}
```

Here's is onexxxfootnote{starred note} and here is a second.xxxfootnote{Daggered footnote}

```
xxxrenewcommand{xxxthefootnote}  
xxxsetcounter{footnote}{0}
```

To do asterisk footnotes, use the command:

Here is the text $\^*$ xxxfootnotetext{ $\^*$ Here is the footnote}.

FOR OVERHEADS AND HANDOUTS

```
xxxreversemarginpar  
xxxtopmargin -1in
```

```
xxxoddsidemargin -.25in
xxxtextheight 8.7in
xxxtextwidth 7in
xxxpagestyle{empty}
```

LISTS

```
xxxlistoffigures
xxxlistoftables
```

```
xxxbegin{description}
xxxitem[Oranges:] a fruit that Amelia likes a lot, just as she likes
grapes and pickles.
xxxitem[Lettuce:] something Amelia does not like.
xxxend{description}
```

```
xxxbegin{verse}
  This is the first line of a poemxxxxxx
  Here is the second, hwich is so long that it runs over on
to the next
line, where it will be indented.xxxxxx
  And here is the third.xxxxxx
xxxend{verse}
```

```
xxxbegin{comment}% I need to have xxxusepackage{verbatim}
  This is a comment.
xxxend{comment}
```

```
The table is on page xxxpageref{t1}.
%This prints the page number where label t1 is found.
```

```
{xxxit Here is some italics but with xxxemph{these words} emphasized in
```

Roman.} I can also use the same command to get xxxemph{italics} in the middle of Roman words.

Use \$xxxBeta\$ in tex, rather than \$B\$, so I can globally change it easily later.

<http://www.mackichan.com/>

Here is how to make a tex DVI file into a postscript file:

```
dvips 9.dvi -Z -o myfile.ps
```

The -Z compresses it. The postscript files are quite large, though. (394K from 70 K, for example, with 3 diagrams). The -Z command will compress it about 40 percent, I think, and it will still print directly.

TO TURN A DVI FILE INTO AN ASCII FILE:

```
uuencode 9.dvi 9.dvi > negot.asc
```

The command @{} kills the space between columns in a table and replaces it with whatever is in curly brackets. It can be used to cleverly align tables around decimal points, thus:

```
xxxbegin{table} [! h] %This puts the table right here, not floating.
```

Or just try:

```
xxxbegin{table}[h]
```

```
xxxbegin{table}[! h t] %This puts the table here or top
```

xxxbegin{figure}[! b f] %This puts it at the bottom or on a float page.

```
xxxbegin{table}[!b]   xxxlabel{t1}
xxxbegin{tabular} {l r @{} l}
Variable zzz Meanxxxxxx
  X zzz  1 zzz 234xxxxxx
  Y zzz 23 zzz 1xxxxxx
  Z zzz 1456 zzz 34567xxxxxx
xxxend{tabular}
```

xxxcaption{The World in 1812} %This will appear as Table 1:
The World...
xxxend{table}

(I Haven't tried this)

I need to write large tables that span many pages; I tried the tabular environment but found out that it put everything on one page, with most of the text going down the drain, i.e. below the physical page. Is there a way of doing this smoothly, that is, without breaking the large table into smaller ones that would approximately fit into one page each? Answer: For LaTeX2e: You should look into either supertab.sty or longtable.sty, both can be found in:

/usr/um/generic/tex3.141/latex2e/tools/

with documentation in:

/usr/um/generic/tex3.141/latex2e/tools/doc/

in the form of .dtx and .dvi files, you can run LaTeX on the .dtx files, or simply look at the .dvi files.

PACKAGES

To put in a package: All packages are located in TCI_{tex}/tex/latex . I am not sure if I can put a new one in with a new directory, and it will get read in. Tha ovrked at the office, but not at home, f or a0poster. I can just use ADD to get verbatim.

A0poster is good for large font sizes.

```
documentclass[article ]{a0poster}
usepackage{a0size}
```

In TEXTPAD, hard breaks are put in, sometimes in awkward places, so I may have to do some fiddling to make sure key commands do not get cut across lines.

The easiest way to get headings of funny 'sections' such as prefaces in the table of contents is to use the counter secnumdepth described in Appendix C of the LaTeX manual. For example:

```
xxxsetcounter{secnumdepth}{-1}
xxxchapter{Preface}
```

Of course, you have to set secnumdepth back to its usual value (which is 2 in the standard styles) before you do any 'section' which you want to be numbered.

Similar settings are made automatically in the LaTeX book class by the xxxfrontmatter and xxxbackmatter commands.

This is why it works: xxxchapter without the star does

- 1.put something in the .toc file;
- 2.if the secnumdepth counter is greater than or equal to zero,

increase the counter for the chapter and write it out.

3.write the chapter title.

From the NoT os short intro to Latex 2e

```
xxxinclude {chap2.tex, chap2.tex, chap3.tex}
```

```
xxxincludeonly{chap2.tex} %This means only chap2.tex will be included.
```

This does not work in SWP.

For packages:

<http://www.ctan.org/tex-archive/help/Catalogue/alpha.html>

ADVICE TO BEGINNERS

Do not use commands like `xxxsection{sd}`, `xxxtheorem{sd}` and so forth. In reading the ms, this means you cannot see the number of the section or theorem. It is easier, for articles as opposed to books, just to use boldface and noindent directly.

```
xxxbegin{tabbing}
```

```
% set the tab positions
```

```
xxxhspace {1in} xxx= xxxhspace {1in} xxx= xxxhspace {1in} xxx= xxxhspace {1in}
```

```
xxxxxxx
```

```
one xxx> be xxx> due to xxx> differences,xxxxxxx
```

```
one xxx> to xxx> reputation xxx> the sortxxxxxxx  
xxxend{tabbing}
```

MY STANDARD FORMATTING HEADER:

```
documentclass[12pt,epsf]{article}  
usepackage{mathpazo} % for palatino font  
  
usepackage{verbatim} % for xxxbegin{comment} feature.  
  
usepackage{ccaption} xxxcaptiondelim{}xxxrenewcommand{xxxthefigure}{}  
xxxrenewcommand{xxxfigurename}{} %for good figure captions  
  
xxxrenewcommandxxxfloatpagefraction{.9}  
xxxrenewcommandxxxtopfraction{.9}  
xxxrenewcommandxxxbottomfraction{.9}  
xxxrenewcommandxxxtextfraction{.1}  
xxxsetcounter{totalnumber}{50}  
xxxsetcounter{topnumber}{50}  
xxxsetcounter{bottomnumber}{50}  
  
usepackage{hyperref} xxxhypersetup{breaklinks=true, pagecolor=white,  
colorlinks=  
true, linkcolor=black, hyperfootnotes= false, urlcolor=blue }  
xxxurlstyle{rm}  
  
usepackage{graphicx} %for pictures  
  
usepackage{amsmath}  
  
usepackage{amssymb}  
  
xxxreversemarginpar  
xxxtopmargin -.3in  
xxxoddsidemargin -.1in  
xxxtextheight 8.5in  
xxxtextwidth 7in  
xxxbaselineskip 16pt  
  
begin{document}
```

```
xxxtitlepage

xxxbegin{raggedright}

  xxxparindent 24pt

  xxxparskip 10pt

adsfqdfadfasdfasdfsaf

  xxxend{raggedright}
end{document}
```

<http://www.usq.edu.au/users/leis/notes/latex/> has good latex
diagram instructions.

times Times, Helvetica, Courier
pslatex same as Times, but uses a specially narrowed Courier. This is
preferred
over Times because of the way it handles Courier.
newcent New Century Schoolbook, Avant Garde, Courier
palatino Palatino, Helvetica, Courier
palatcm changes the Roman to Palatino only, but uses CM mathematics

Small Capitals xxxtextsc{words to be in small capitals} puts the words
in the
brackets in small capitals

xxxtextsl{words to be slanted}

<http://www.image.ufl.edu/help/latex/fonts.shtml>
