

## USING T<sub>E</sub>X

There is absolutely no requirement that you use T<sub>E</sub>X for your homework. But if you do, then you must learn to do it properly.

**Required.** Use 1-1/2 line spacing on all T<sub>E</sub>Xed-up homework. This is in addition to using 12 point type and leaving at least standard margins.

**Plain T<sub>E</sub>X.** You need to be pretty good at it in order to produce decent math. If you are not all that good, then I strongly suggest that you start using  $\mathcal{A}\mathcal{M}\mathcal{S}$ -L<sup>A</sup>T<sub>E</sub>X (which is designed specifically for producing math).

**$\mathcal{A}\mathcal{M}\mathcal{S}$ -L<sup>A</sup>T<sub>E</sub>X.** Go to <http://www.ams.org/tex/amslatex.html>. How much of the documentation you need depends on how much you already know and how motivated you are.

**$\mathcal{A}\mathcal{M}\mathcal{S}$ -T<sub>E</sub>X.** I sympathize, but the war has been lost: Give up and switch to  $\mathcal{A}\mathcal{M}\mathcal{S}$ -L<sup>A</sup>T<sub>E</sub>X, which the AMS itself is now pushing.

I use  $\mathcal{A}\mathcal{M}\mathcal{S}$ -L<sup>A</sup>T<sub>E</sub>X with `amsart`. Below is how I produce 12 point type and 1-1/2 line spacing with tolerable margins (but I have no objection at all to *wider* margins). I don't know if these commands work without `amsart`.

```
\documentclass[12pt]{amsart}
\usepackage{amssymb,latexsym}
\pagestyle{plain}
\setlength{\textwidth}{6.4in}
\setlength{\textheight}{8.5in}
\setlength{\hoffset}{-.7in}
\setlength{\voffset}{-.4in}
\renewcommand{\baselinestretch}{1.5}
```

(Your user commands follow.)

**Be generous with displays.** It's true that journals like to minimize displays but you are not yet facing this. On the other hand, some expressions look cramped inline but ridiculous as displays. For ways around this, look up the usage of `\dfrac` and `\displaystyle`.

**Include diagrams when appropriate.** Just because you are using T<sub>E</sub>X doesn't mean that you *shouldn't* include pictures or diagrams to illuminate your arguments. Rule of thumb: If you would include a diagram if you weren't using T<sub>E</sub>X, then include it even when you are using T<sub>E</sub>X. This certainly doesn't mean that you have to produce fancy graphics to match your fancy T<sub>E</sub>X. You may insert blank space and draw your diagram by hand, or even put your hand-drawn diagrams on a separate page (appropriately labelled).

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**Math operators.** Whatever flavor of  $\text{\TeX}$  you use, producing “ $\sin x$ ” or even “ $\sin x$ ” when you mean “ $\sin x$ ” is unacceptable. (And  $\sinh(xy)$  is an abomination: does it mean  $\sin h(xy)$  or  $\sinh(xy)$ ?) Use the math operator `\sin`. Similar remarks apply to `cos`, `arctan`, `max`, `min`, `sup`, `inf`, `exp`, `lim`, and other math operators. Lists of already-defined operator names appear in the above-mentioned documents. You can (and should) define your own commands and operator names as well, whenever appropriate. For example, to get  $\mathbb{R}$  (in  $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\text{\TeX}$ ), I put `\newcommand{\R}{\mathbb{R}}` in my preamble and then type `\R` whenever I need it. To get `dcl(X)`, I put `\DeclareMathOperator{dcl}{dcl}` in my preamble and then type `\dcl(X)`. For infrequently used operators, there is a local option: `\operatorname{Xyz}` produces “ $Xyz$ ” in `\mathrm` font, not just ordinary roman font.

I don't know how plain  $\text{\TeX}$  deals with math operators. Maybe it's the same.

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