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1. *Assignment*
 - a. Are there further questions about the social organization of mathematics?
 - b. I have selected some papers for us to critique: a term paper written at another college in 1982, by a senior whose native language was not English, for a capstone course in the mathematics major. It is online, with the link “Bees Term Paper”. Below is my critique of its first paragraph. You should be able to criticize the remainder of it similarly. I asked someone to lead a discussion of similar editing of two more paragraphs.
 - c. I posted two other term papers for similar treatment. Please note: these are *good* papers that need polish.
 2. Here is a possible copyediting critique of its title and first paragraph.
 - a. *Title*. No quotes, please.
 - i. Rephrase to avoid the doubly-hyphenated word.
 - ii. A more succinct title might be *How the bees do it*. But that might cause snickers, so better rephrase. (Actually the reference is to a 1940s Cole Porter song, “Birds do it, bees do it, even educated fleas do it. Let’s do it, let’s fall in love.”)
 - b. *It is interesting...* Omit “It is interesting to note that”.
 - c. *With the help...*
 - i. *an* electron microscope
 - ii. one *can* find
 - iii. *icosahedral*
 - iv. *viruses*
 - v. a regular *polyhedron*
 - vi. in a *radiolarium*
 - vii. Insert a comma after *radiolarium*.
 - d. *One may also...*
 - i. Since *viruses* was plural so should be *honeycombs*. Thus *hexagons* should be, too. The *one can find* and *one may also find* parallelism is distracting, so I’d write in place of this sentence, *Bees’ honeycombs also display hexagonal symmetry*.
 - e. *The honeycomb of...*
 - i. Omit *of the bees*.
 - ii. *consists*
 - iii. Omit *bee-*.
 - iv. Insert a comma after *cells*.
 - v. I wonder if the cells are similar enough to prisms to be called *prismatic*.
 - vi. *vessels*
 - f. *The openings of...*
 - i. Use *bases* not *bottoms*; the latter invites derision.
 - ii. *rhombi*

- g. *The ancient Greek ...*
 - i. Close up the whitespace after the double quote.
 - ii. Replace “*, most excellent Megathon,*” with an ellipsis. It’s not relevant and you wouldn’t want to be required to explain it.
 - iii. *among*
 - h. *Pappus goes on*
 - i. *Pappus concluded*
 - ii. *honeycombs*
3. We digressed about preparation of graphics for papers.
- a. Several years ago I started writing a book, tentatively titled *Mathematics and Mathematica*. I worked out its chapter 11, on two-dimensional graphics. It’s on the web, in nearly publishable form. There’s a link on this course’s home page. You need to use the password m&m (lowercase, no spaces). There you’ll find *.pdf files for its dozen or so subsections, and some *Mathematica* notebook files.
 - b. Some of the notebook files require an add-on package called twoDG. You’ll find in this material instructions on installing it if you wish. In fact, you’ll find instruction about how to assemble your own ensemble of *Mathematica* functions into an add-on package just like the commercial ones.
 - c. Warning: *Mathematica* has changed versions since this package was built. It’s first execution generates a lot of error message about colors. But it works for graphics that don’t use color. I haven’t updated its color facilities yet.
 - d. This chapter demonstrates virtually all of the built-in *Mathematica* 2D graphics features that were available when I wrote it. Those demonstration programs do not use my twoDG package. So you can get an idea of what’s possible by browsing through the text files; they’re amply illustrated.
 - e. I’ve been using twoDG this week to produce some geometry diagrams for a short paper I’m writing on definitions and nondefinability. That’s online also, with a link on this course’s home page, so you can see what I was talking about. This kind of diagram is the package’s intended purpose. For example, I spent a great deal of time designing its functions that produce tick marks, so that I can now draw diagrams like this almost freehand, without stopping to figure out details like those.
 - f. That is not a chore for amateurs, by the way. There is quite a lore about how to design such functions to make them easy to use. Unfortunately, *Mathematica* is by no means the ideal programming language for that sort of thing, but it’s what we use at SFSU.
4. That paper and most of the chapter 11 files required
- a. design of figures (generally brainstorming with pencil and scratch paper),
 - b. implementation with *Mathematica*, checking the results onscreen against the design,
 - c. exporting *Mathematica*’s graphics output to a file,
 - d. designing the figure placement and labels in the word-processor context with empty graphics boxes,

- e. importing the graphics file into the word processor,
 - f. moving labels into the correct position with the word processor.
5. Choosing the appropriate file format is a trial-and-error process. For this production scheme, I know that `*.eps` files work: *Mathematica* exports them, *Word-Perfect* imports them, and the results look good enough to publish.
6. Someone noted that that my circles looked jaggy on the projected display. But if you print the `*.pdf` file at 85% reduction, which is how Marchisotto & Smith 2007 was done, they look just fine. If I needed smoother curves for large-scale projection, or for some other scenario, I'd go into trial-an-error mode. I doubt that I'd be able even to get professional help.
7. One very important strategy that is evident from the above discussion is this: *Don't ask Mathematica to make your figure labels!*
- a. While it does have features for matching your text fonts and placing labels precisely, *Mathematica* is much harder to control than a good word processor, and you'll be frustrated by ugly results.
 - b. The secret is to import *Mathematica*'s exported graphics output file into a graphics box that *lies under* the text in the word processor. I set the word processor to position that box as though it were a giant character, and to make it transparent, so that I can enter new characters for labels right on top of it. I can control their microspacing visually with ease and great precision. And obviously, I can match my text character set.