**Writing Mathematics**

Writing mathematics well is an art that requires practice and feedback. The right combination of text and symbols can make an argument easy to follow. The wrong combination can make it impossible. Your goal should be to make a proof as easy to understand as possible.

1. A write-up is not simply a summary of how you solved a problem. It needs to be an argument of why your result is true.
2. Every non-trivial step should have a reason. Reasons are usually short and clear. Not every reason needs to be written down, but those that are not written need to be truly obvious (for example, when something following directly from the previous step, or involves basic algebra). Steps that involve things we are studying should be explained.
3. Be clear where assumptions are used.
4. Everything written (text and equations, but not pictures) should be in a sentence. Be sure equations and other notations are legible. If you are typing them, learn how to use the equation editor in MS-Word or how to format them correctly in LaTeX.
5. Be sure it’s clear where every sentence begins and ends, i.e., use capital letters and periods! With very few exceptions, a sentence should not begin with a mathematical symbol. Similarly, an independent or dependent clause should usually not begin with a mathematical symbol.
6. Avoid cryptic writing. Write enough so the reader can easily follow the flow and structure of the proof. In general, what you might write on the board for a presentation is much too cryptic for a write up.
7. Be sure that every bit of notation you introduce is defined in your write up, either in the statement at the beginning, or in the course of the proof. For example, if you start using the letter “M” for something, you need to tell the reader what it represents.
8. Never use an isolated symbol to represent a part of speech (such as =, <, >, $≅, ≈$). For example, “We now see that *a* and *b* are =.” is ugly, and it throws the reader off balance. Much better is “We now see that *a* = *b.*”
9. Don’t use abbreviations or symbolic shortcuts such as iff, st, &, $∀, ∃,⇔, ⇒, ∵, ∴,$ etc. These are fine when making a presentation, but are not considered good writing style.
10. Colons and “such that” are often used incorrectly. See the separate handout on this.