

Mathematics is about having the right ideas, but as you mature as mathematicians, it becomes increasingly essential that you be able to express those ideas clearly and precisely. If you can't communicate an idea to others (particularly your grader), then it hardly matters how brilliant or insightful it may be. In that vein, I've compiled a list of guidelines for proof writing that should make all of our lives easier:

1. Write in complete sentences. This is by far the most important change you can make to improve your proofs. Also, make sure those sentences are grammatically correct – nobody would submit an English assignment full of sentence fragments and incorrect punctuation, so why would anybody do the same in mathematics?
2. Use symbols correctly. First, you must know the *exact* meaning of any symbol you use. Second, remember that symbols are shorthand for words, so you should be able to read them as you would any other written language (in particular, this means that they should conjugate correctly when used as verbs). Finally, if using a symbol would simplify your exposition, do it!
3. When you begin a proof, state what you're trying to show. When you introduce a new variable, state precisely what it is. When you finish a proof, state your conclusion explicitly.
4. Avoid proofs by contradiction unless they're truly necessary. In general, it's better to use a direct proof than a proof by contradiction – doing so shows why a result must be true, rather than why its negation can't be true. That allows the relevant ideas to shine more clearly. Also, most of the time, elementary proofs by contradiction can be rewritten as direct proofs without changing any of the ideas involved.
5. Eschew obfuscation. Always look for the simplest and most elegant way to structure your proofs, and don't include anything irrelevant to the results at hand. This is a general rule obeyed by all mathematicians.

One thing that may help you obey these guidelines is to work through the problems on scratch paper, write drafts of the proofs, edit them for grammar and punctuation, then rewrite clean final copies for submission. Good luck!