

A few Conventions for Writing Mathematical Proofs

- **Write in paragraph form:** It is important to make the proof readable. Try to avoid using too much notation. Make sure to use complete sentences.
- **Know your audience:** Make sure you know for whom you are writing. For this course, you should always write your proofs as if you were trying to convince a fellow student in the class. In other words, you may assume that the reader knows the same background material as you, but doesn't know the proof of this particular theorem.
- **English/Grammer:** Use the same conventions of grammar that you use in your other writing classes. It would be a good idea to have a fellow student look through your proofs to check for proper grammar and presentation.
- **Presentation:** Clearly write out what you are trying to prove. Also, clearly label where your proof begins (by writing the word 'proof') and where a proof ends (by writing the letters 'QED'). Leave plenty of space between problems and write large and legibly.
- **Write with precision:** Every mathematical statement you make must have a precise mathematical meaning; every term you use must be well defined, and used properly according to its definition; every mathematical conclusion you reach must be justified; and every symbol you mention must be either previously defined or quantified in some appropriate way. If you write $f(a) > 0$, do you mean that this is true for every $a \in \mathfrak{R}$, or that there exists some $a \in \mathfrak{R}$ for which it's true, or that it's true for a particular a that you introduced earlier in the proof?

Ask yourself two key questions as you write each sentence:

- *What exactly does this mean?*
- *Why exactly is this true?*

- **Write in the first person plural:** It is standard practice to use "we" whenever it can reasonably be interpreted as referring to "the writer and the reader." Thus: "We will prove the theorem by induction on n ," is preferred as opposed to using 'I'.