Proof writing tips

- The intended audience for your proofs are your classmates. Write a proof in such a way that your classmates can easily understand what you are doing.

- Explain what you are doing in plain English. Use complete sentences, following the same conventions of grammar,punctuation, spelling as any other writing.

- Clearly explain the meaning of any new quantity or symbol you introduce.

- Label your formulas.

- Pay attention to quantifiers. If you write $f(a) > 0$, do you mean to say that this is true **for all** $a \in R$, that **there exists some** $a \in R$ for which this is true , or that that this is true for a **particular** a you have in mind or you introduced before?

- Pay attention to the difference between a statement and a formula. "$\sum_{i=1}^{5} i = 15$" is a statement, while "$\sum_{i=1}^{5} i$" is a formula and it does not make sense to say something like " assume $\sum_{i=1}^{5} i$" or "I need to prove $\sum_{i=1}^{5} i$" or "$\sum_{i=1}^{5} i$ implies the following" ...."

- When you write something like "$x = 2$ that means you are stating that under the hypothesis of the theorem you are proving x must be equal to 2 and no other value. If you write "**assume** $x = 2$" it means that you are considering what happens when $x = 2$, but the hypothesis of your theorem do not imply x must be equal to 2 (and in your proof you may also have to consider the case when x is different from 2). Clearly state your assumptions (that is do not write $x = 2$, when you really mean "**assume** $x = 2$").

- Identify any theorems you are using from the book, previous homework, lectures....

- Make sure you reread your proofs (ideally a while after you have written them).