Some Guidelines for Mathematical Writing:

References on Writing: The following two pamphlets contain information on the writing of mathematical papers. There are copies in the library.

- **Writing Mathematics Well** by Leonard Gillman
- **How to Write Mathematics** by Paul Halmos
- **A Primer of Mathematical Writing** by Steven G. Krantz

1. **Form for the bibliography**

   The examples which follow show the format for a journal article, an article from a book, and a book respectively. Notice that the items are listed in alphabetical order based on the author's last name.

   [1] R. P. Boas, "Can We Make Mathematics Intelligible?", *Amer. Math. Monthly* 88(1981), 727-731.

   [2] Paul R. Halmos, "How to Write Mathematics", in *Selecta, Expository Writing*, Springer, 1983, 157-186.

   [3] John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior*, Princeton University Press, 1947.

2. **To cite a reference**

   To cite a reference, do it in the following way.

   It has been shown that there is a relationship between the number of evaluations per step in the Runge-Kutte methods and the order of the local truncation error [5,p.56] (where [5] is the number of the reference as listed in your bibliography.)

3. **Writing Style**

   - Do not begin a sentence with a symbol. For example, instead of saying "G is an abelian group," write "The group G is abelian."
   - One generally uses "we" instead of "I" when describing your plan, etc.
   - Use the active voice in preference to the passive voice.
   - Use examples liberally.
   - If you begin a sentence with the word "if", then do not forget to include the word "then." Leaving out the "then" could confuse the reader.

4. **Formatting**

   - Italicize terms being defined. (See the example in item 6.)
   - Use standard notation. For example, the symbol f represents a function, the letter x a variable, the letter n a natural number.
   - Put long or complicated expressions on a line by themselves.

- Leave a double space between symbols and adjacent text.
  Example. "Let z be a complex number" as opposed to "Let z be a complex number."
  Example. "The function f is differentiable" as opposed to "The function f is differentiable."
- Do not use the symbols for "for all" or "there exists."

5. Form for Theorems:

Theorems and their proofs should be set off from the surrounding expository material. Proofs should be block-indented. Below is an example of the style we want. Pretend that the following is an excerpt from your paper.

BEGIN EXCERPT

The next theorem is a classic result in Calculus.

6.5 Theorem: If a function f is differentiable at a point a, then f is continuous at a.

Proof: We are given $f'(a) = \lim_{x\to a} \frac{(f(x)-f(a))}{(x-a)}$ and we need to prove that $\lim_{x\to a} f(x) = f(a)$. We have

$$f(x) = (x-a)\frac{f(x)-f(a)}{x-a} + f(a)$$

for $x \in dom(f), x \neq a$. Since $\lim_{x\to a}(x-a) = 0$ and $\lim_{x\to a} \frac{(f(x)-f(a))}{(x-a)}$ exists and is finite, Theorem 20.4(ii) shows that $\lim_{x\to a}(x-a)\frac{f(x)-f(a)}{x-a} = 0$. Therefore, $\lim_{x\to a} f(x) = f(a)$, as desired. QED

We will now provide an example of this theorem.

END EXCERPT

Note that we did not use a cute symbol to mark the end of the proof. You may use the symbol of your choice; QED or a box ($\square$) are standard choices.

6. Numbering systems in the senior comprehensive paper

Each chapter should be numbered. Then each item in that chapter which needs to be numbered is assigned a number as follows: chapter number.ordinal number of the item. That is, the fifth numbered item in Chapter 2 is assigned the number 2.5

EXAMPLE:

Chapter 3 The Derivative

3.1 Definition: Let f be a function defined on some open interval (a,b) containing the point x_0. The *derivative of f at x_0* is ....

3.2 Example: Using the definition, we will compute the derivative of $f(x) = x^2$ at the point $x = 3$.

By the definition, $f'(x) = \ldots$.

3.3 Example:

3.4 Lemma:

Proof:

3.5 Theorem: If a function is differentiable at a point, then the function is continuous at that point.

Proof:

3.6 Corollary:

Proof:

3.7 Example: In Example 3.2, we showed that $f(x) = x^2$ is differentiable at $x = 3$. Thus, by Theorem 3.5, the function $f(x) = x^2$ is continuous at $x = 3$.