Guide to Writing a Comps Paper in Mathematics

Technical Tips:

These formatting elements are consistent in nearly all math writing.

- Cite sources using the following format:
  - First, make a References section at the end of your paper and number them. References should be in alphabetical order by author’s last name. Then, when you refer to them within the text, use their number in brackets, for example [1].
- Number equations you plan to reference again
- Center equations you want to emphasize, otherwise simply include them in-line with the rest of your text
- Number pages
- Include easy to follow, short algebra or equation manipulation
- Include an appendix. This should contain any long, technical, or distracting proofs or additional information that the reader doesn’t need to see (supplemental computer programs, etc.)
- Consider sub-headers to structure and clarify arguments
- Number figures and tables, and include a short caption

“Academic Writing” Tips:

These are elements of a strong paper in any subject, but the ones listed here apply specifically to mathematical writing.

- Have a thesis/focus
  - Don’t take on a topic that is too big to explore deeply
  - Take time to understand the topic before you even begin writing, this way you will not rely too heavily on your sources
- Understand your argument/topic
  - In a math paper, this usually means understanding the math behind what you are arguing.
  - Understanding your topic is important to enable you to CLEARLY COMMUNICATE your points
- Keep your audience in mind
  - Decide what level of reader you have in mind, and give enough background/detail for that reader
  - For comps, the audience is junior and senior math majors
- Stay focused
  - Make sure that examples you use and concepts you introduce are relevant to your topic.
• Clearly define all terms
  o Make sure these definitions are precise, mathematical definitions. After you define a term, you can clarify with a vague example or paraphrase if necessary.
  o Although the audience is primarily people who know basics about math, you still need to define terms that are specific to your paper.

• Use examples
  o Examples clarify the concepts you are explaining. They demonstrate to the less experienced reader why what you are saying is true or reasonable
  o Pictures and figures also help clarify your points. Use them wisely.

• Justify appropriately
  o Just like in proofs, assertions in your paper need justification. This means a logical argument that appropriately uses theorems, definitions, and sound logic.
  o Justify to the point where a junior or senior math student would fully understand.
  o Check your logic, and make sure it is sound. When justifying, make sure you don't make simple logic mistakes.
  o Develop your paper in a logical order, with your audience in mind. Anticipate what questions a student might have, and answer those questions.

• Say what you mean
  o Be exact and specific in your language. For example, if you mean, "The sum of two rational numbers is a rational number," say that! Don't say something less exact like "The sum of two numbers is rational."
  o Don't use large words when small ones will do. The math may be complicated, but the writing doesn't have to be.

• Explain why your topic matters
  o Apply what you have explored to real world applications OR the world of mathematics as a whole. This is often done in the introduction
  o This gives the reader motivation to read your paper, and shows the reader your topic matters.

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