

“Proofs for the Public” writing assignment.

Fall 2015 MA 274

Overall Goal: In this paper, you will take one of the more significant proofs (or a few closely related proofs) from the course or text and explain to the mathematically educated general public the underlying concepts, how they fit together, and their broader relevance.

The excellent paper will draw the reader into the subject with apt analogies, metaphors, figures, or applications. These analogies, metaphors, and applications will, however, be clearly separated from logical argument. The paper will introduce the relevant definitions and show how mathematical ideas can be logically ordered so as to produce the result. It will be neither drown in technicalities nor wallow in vague generalities, but will select with care the right idea at the right moment.

Audience: You should aim your paper at people who have had some college level math courses (eg. calculus) but who may not remember it particularly well and who may not understand the importance and relevance of abstract mathematics. You should assume that the person reading your essay is interested in mathematics and is willing to be persuaded that what you have to say is interesting.

Content: In consultation with your professor, you should pick one of the more interesting results or collection of related results from the course (either from HW, reading, or class discussion) and explain the relevant definitions, theorems, and proofs in a way that the intended audience will find accessible. You may choose to help your exposition by using vivid metaphors and analogies and by including images or figures. You may choose to leave out details which are overly technical or which will distract from the beauty of the arguments you are conveying. However, you should include all the major ideas incorporated in the proof. The end of your paper should include an appendix where you include the complete, formal proof of the result. As this is not a research paper, you should not need to cite anything; however, if you do make use of sources other than the text or class notes, be sure to cite it appropriately.

Formatting: You must type your paper in LaTeX (the mathematical typesetting system). This system can be found on all the computers in the Math/Stats department and is freely available for installation on your own computer (details to be distributed). The best way to begin learning LaTeX is by editing the sample file I will provide to you. You should use 11 pt font and the default margins. Images should be included as figures, as in the sample document. Neatly hand-drawn figures are acceptable. All figures should be referenced in the text. The paper, including any figures, should be 3 – 8 pages long, depending on topic.

Grading Rubric:

- 25% To what extent is the paper accessible to the intended audience? Are analogies, metaphors, and figures aptly deployed?
- 25% To what extent is the paper engagingly written. To what extent is there the right blend of formality and informality and the right level of detail?
- 25% Is the mathematics correct and interesting? Are there significant ideas which have been incorrectly explained or omitted? Are the ideas assembled in clear, logical fashion?
- 10% To what extent is the mathematics put into a larger intellectual context? Is it clear why a non-mathematician should be interested in the results?
- 10% Is the paper correctly typed in LaTeX, following the formatting rules?
- 5% To what extent does the writing exhibit correct grammar, punctuation, and spelling?

More Information on the Paper

How do I choose a topic?

Think about what topics from the course have interested you most: graphs? sequences? Russell's paradox? Infinite cardinalities?

Pick one aspect of that topic that you want to explain to a mathematically educated general audience. Your paper will likely center around one proof which you want to explain in an engaging and accessible way.

What are the deadlines?

Friday, November 20: You should turn in (separate from HW) a topic proposal including which proof or proofs you want to explain. If you are deciding between two and want my input that's fine.

Monday, November 30: An outline which covers what order you'll discuss things in and what you'll use to draw the reader in. (An interesting application? A compelling metaphor?)

Monday, December 7 (optional): A draft of the paper for me to read.

Friday, December 11: Final draft of paper (typed with LaTeX) by email.