

MATH 444: MATHEMATICAL RESEARCH AND WRITING

Assignment 2 Due Thursday Jan 20, 2022 pdf file uploaded to Canvas.

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Part 1.

I wish you to state and write up a proof of a theorem. To choose a theorem, you could use some theorem/proof that you remember liking. Pythagorus? Some other geometric proof? Linear Algebra? Counting? Number Theory? I imagine at most one page.

I want a clear statement of the theorem (i.e. hypotheses and conclusions). I want a well written, complete proof. You can assume some basic facts but I ask that you state what facts/definitions you are using. Some facts are well known but it can be important to see what facts are relied on in a proof. Any motivation of the result or proof would be a bonus. The proof should be in your words. I'm not interested in copied proofs. Cite any sources you used for the proof.

I will mark by a variety of criteria. Clarity of the exposition will be the main focus. I will also look towards Mathematical interest. Would it make a nice but short exposition in a talk to a Mathematically interested audience? The criteria of clear exposition will be marked more aggressively as the term progresses. While using few words can be helpful, I'd recommend making extra sure that you have carefully stated the theorem and conveyed the proof. Part 1 will form 2/3 of assessment of Assignment 2.

Part 2.

I will hand you (in groups of 2?) a proof an elementary problem taken from a 3rd year majors level problems course I took some decades ago. You will receive (by Tuesday Jan 19) the statement of the problem and an outline of the proof. I will expect your group to write up a solution and submit it as a pdf file on Canvas. You need not include your name on the pdf file. We will present and discuss in class aspects of the written solutions (style, clarity, etc). Part 2 will form 1/3 of assessment of Assignment 2. I think the problems can be quite fun and moreover I will have given you a mostly complete outline of the solution which you will need to digest. We will likely repeat this exercise later in the term.

The point of Part 1 is to continue to emphasize the need for clarity. Part 2 is more for fun but it is often easier to 'understand' a solution than to state it clearly. This arises all the time in research particularly in preparing a paper for publication.