

KAM-Geometry Semester 2 Portfolio Assignment

This assignment is mostly reflective, rather than purely mathematical. It has three parts.

I. How did I get here?

As you finish 11th or 12th grade, most people your age are still struggling to graph equations of lines, or even understand what it means for a line to have an equation. You, obviously, are not like most people your age. Thinking back—way back, if necessary—what got you to where you are? What did you do? What did other people do for (to, with, about) you? To what habits, dispositions, activities, or chance encounters do you attribute your mathematical success so far? When did you first realize that you liked math, were good at math, or both, and under what circumstances? (Did you ever not like math, or feel bad at it? Where there people, events, circumstances, habits, or dispositions that got in your way?)

This part of the portfolio really has two objectives. One is purely for your benefit: to think carefully about what success in math has meant for you so far, and what it's taken for you to achieve it. The other is mostly for my benefit: as a teacher (and parent), I'm curious about what goes into being a "young KAM".

II. What is "here"?

This section is the most mathematical part of the portfolio. What are, to you, the main ideas of the course this semester? If someone familiar with high school math (but not KAM) were to sit down with you and give you ten or fifteen minutes to describe the "big picture" and how the different themes (iteration, fractals, chaos, Mandelbrot/Julia sets) fit in, what would you tell them? You can envision this part of the assignment as a traditional expository essay, dialogue, hyperlinked document, "New Media" type presentation, or whatever other form best suits your own sense of how these ideas and concepts fit together. Please do make sure your entry—whatever form it takes—has actual descriptive content, and is not just a list of key terms and ideas. Your "compare and contrast" essay is a good starting point, and could even provide a framework or overall context for the paper.

III. Where to next?

Some of you are taking KAM again next year; others of you are going to college, where you're going to decide what (if any) math courses to take, when (if ever) to take them, and how (and whether) to do the work they assign. How do you feel that KAM has prepared you for those experiences? Has it changed the way you think about math? The way you approach "hard" or "easy" math problems? It's okay to say that KAM hasn't changed much about what you think or do, but don't use that as an excuse not to think carefully about what you think or do—a good response in this category might look like "Before KAM, I did this and this and this, and now, I still do that, because" Outside of future coursework, how do your KAM experiences fit into your sense of what math is, what math is about or what it means, and what doing math entails? How does having done this mathematics affect how you see things?

General Instructions, Page Counts, etc.

Your portfolio should consist of three distinct pieces; each piece should cohere in some way, although (especially in part II) it doesn't have to be a single, traditional, expository essay. Your portfolio should be typed, with the possible exception of Part II (e.g. if you've decided on interpretive dance as your medium of choice). In terms of typed-double-spaced-pagination, part I should be about 2 pages, possibly a little more; part II should be equivalent to a 4 page paper, including diagrams in the page count (more is

possibly but certainly not necessarily better); part III should be 1-2 pages. The entire shebang should have a cover page with catchy title (“KAM II Portfolio” is fine unless you think of something better).

Grading

Portfolios will be graded on thoughtfulness, correctness (in the case of Part II), and technical competence. That is, the best portfolios will

- Contain detailed, thoughtful replies to most of the questions posed, in a way that makes sense and is reasonably logical and coherent.
- Demonstrate serious consideration of the questions, for example, by considering multiple possibilities, and by painting what seems like a complete picture (metaphorically or literally as the case may be).
- In part II especially, report accurately on the mathematics we studied, showing a deep understanding of the “big issues” as well as a firm grasp on the details (for example, not confusing Julia and Mandelbrot sets; actually describing multiple relationships between fractal images and iteration).
- Show care in writing and packaging, as demonstrated by technical correctness (spelling, grammar, punctuation), and structural soundness (physically, and also logically).