Mathematical Biography

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I asked each of you to write a mathematical biography, so I thought I'd do so as well.

I love math—but I absolutely hated it for the first eighteen years of my life. I was a good student generally, but math classes I hated and did poorly in. They were so boring. The material never made any sense. Nothing was ever explained well. There didn't seem to be any point to why we were doing anything. Everything was just memorization and regurgitation of pointless formulas and procedures. The teachers were all boring and awful. I think they all disliked me as much as I disliked them. I didn't even really take math the last two years of high school. (I think that made my dad, who's a math lover and physics professor at Cornell, pretty upset.)

Then, at my college, everyone had to take a year of calculus. So I did, and the teacher wasn't even very good—just a tired grad student at 8:30 in the morning—but all of a sudden everything came together. All of the dumb, boring stuff we had been doing for the previous decade of my education—the formulas, the memorization, the unmotivated procedures—suddenly I realized how it all made sense and fit together and was unified through calculus.

My best experience involving math was in an abstract algebra class my fourth year of college. We were studying abstract linear algebra, and one of the problems on the problem set was to prove that the determinant of a triangular matrix is just the product along the diagonal, using the exterior powers definition of a determinant. It doesn't really matter what that means, but it was a proof that involved a lot of details, and a lot of calculations. I had a lot of different ideas for strategies, but each time I tried writing out all the details (which took a long time), it didn't work. Then, finally, 30 minutes before class, sitting on the armadillo swing, I realized how to do it. In a flash, the idea came to me—with much more solidity and veracity than my previous half-hearted methods. I didn't have time to write out all the details of the proof, so I quickly scribbled down how I would have if I had had time. I was so excited.

My worst experience in math was in that same abstract algebra class. There was a question on the problem set I was struggling with, and I went to the instructor's office hours for help. I was confused by some part of it, and the instructor kept trying to explain it, but I just couldn't see it. So I kept asking. He got really frustrated that I didn't understand. He eventually accused me of just wanting him to tell me the answer, which I didn't. I started crying. I don't cry easily, and that's still the only time I've ever cried in an academic context. It was awful. Walking back to my dorm, ten minutes later, I realized exactly what he had been trying to explain—and actually it *was* a pretty obvious point! I just had trouble seeing it for one reason or another.

I really liked my abstract algebra and algebraic topology classes in college. Recently I've been learning some number theory, which is difficult but fun (difficult *and* fun? fun because it's difficult?). Number theory is about the structure of the positive integers (e.g., why are the prime numbers the way that they are?), and so is really fundamental and beautiful. That's what I like about math in general: it's an art. It's not a bunch of formulas to be memorized, or a tool to be used in solving engineering problems. It's beautiful, and it's real.

I still don't think of myself as being very good at math. It takes me a long time to learn new things, and I get confused a lot. Often I'll try to do problems which I don't even know how to start. That can be really frustrating and demoralizing. It makes me feel stupid. I have to work hard to

be persistent and not get so frustrated that I give up. I have a lot of friends who are professional mathematicians, and they know a lot more math than I do, and seem to be able to learn it way faster than me. That makes me feel bad, too. So I have to work hard to not compare myself to others, and to remind myself that I can learn more math, and I can have fun with math, regardless of what "other people" might or might not know.

I'm excited to be teaching at Lansing for the rest of the year, because all my classes seem really great, and all my students seem wonderful. In Pre-Calculus, I'm excited to get everyone into awesome shape for taking calculus (since I've taught calculus, as well as pre-calc, several times). In Pre-Geometry, I'm excited to do constructions, which I haven't done since I was in high school, and help everyone understand basic properties of shapes and coordinate systems, so that they're all really good at Geometry next year. And in Fundamentals of Algebra, I'm really excited to help everyone build some confidence and basic skills so that they'll all do great in Algebra next year.

I grew up in Ithaca and went to Ithaca High and the University of Chicago. My love for math is matched only by my love for writing—I was an editor of the student paper both in high school and college. My first experience teaching was the summer I was 17, when I worked and taught in a Japanese language-immersion summer camp in Minnesota. (I lived in Japan for a year growing up, and went to a Japanese elementary school, so my Japanese used to be decent.) I also really like reading, running, rock climbing, riding my bike—anything that starts with an /r/ phoneme.