Math 63: Real Analysis **Winter 2024**

PSET 0 — 01/06/2024

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Problems

1. Why did you choose to take Math 63?

I am interested in learning more about the foundations of mathematics and how a strong grounding in analysis would be very useful in that regard.

2. What career looks interesting to you after getting your bachelor's degree?

I am a double major in mathematics and computer science at Dartmouth. I am most likely going to pursue a career in software engineering or quantitative trading since I have had great experiences with both.

3. What prior mathematics classes did you take?

(i) MATH-11: Multivariable Calculus
(ii) MATH-22: Linear Algebra
(iii) MATH-23: Differential Equations
(iv) MATH-69: Logic
(v) MATH-71: Abstract Algebra
(vi) MATH-75: Cryptography
(vii) MATH-100: Game Theory

I have also done some coursework in theoretical computer science, including Discrete Mathematics (COSC-30), Algorithms (COSC-31), and Theory of Computation (COSC-39)

4. What methods of proof do you feel comfortable with?

Direct proof, induction, contradiction, contrapositive.

5. What is your favorite math fact? Why?

I do not know if I have a specific favorite math fact. But I love that there's a direct correspondence between decidability in logic and computability in computer science – they are almost different expressions of the same thing.

6. Did you use TEX before? If so, how was your experience?

I have used TEX before in various mathematics and computer science courses at Dartmouth. I also have used it for my resume and most recently on a few posts on my blog (such as this one).

7. What helps you understand mathematics and get comfortable with new material?

Writing a lot (proofs, equations, explanations, etc). I think a lot of things stick more when I write them down as I study them. In this sense, I appreciate that you write down a lot of theorems, lemmas, and proofs on the board as you go over them since it helps me follow along and understand the material better.

8. What do you expect from this course?

I *generally* hope develop a more nuanced understanding and perspective of mathematics. I think sometimes a fact or property in a given field gives insight into something else in a somewhat unrelated field. I'm mainly excited to learn and hopefully love the mathematics presented in this course, but I am also keeping an open mind on how the material connects with other topics and fields of interest.

I am also taking complex analysis in the Spring and I wonder how the two courses will complement or differ from each other.