



Essence of Calculus by 3Blue1Brown
Reviewed by Dhruv



YouTube Series, Math (nonfiction/educational)

Give a summary without spoilers!

This is not your traditional book or tv show. This is a YouTube series that aims to summarize one of the most useful and confusing topics in math: calculus. The goal of the series is exactly what the title suggests: to provide the viewer a basic understanding of the essence of the subject. It aims to convey the core principles behind calculus, the ideas and intuition that are behind this vast subject. Calculus is a very important field of mathematics and has many practical applications in areas such as physics and economics. The problem is that when it is first introduced to many students, many concepts and formulas are presented as something to be memorized. This indeed was the case when I was first introduced to it. The intuition and the idea behind those formulas is never taught. This makes calculus seem confusing and opaque. When in reality, it is actually very visual and intuitive. This series tries to develop that visual intuition. It introduces the core concepts using carefully choreographed animation, music, and narration. It feels like a form of entertainment with a storyline and resolution, when in reality it is just math. The introduction starts with a simple problem: the area of a circle. From there the series delves into the abstract concept of derivatives, Euler's constant, and implicit differentiation. It then goes into the fundamental theorem of calculus and introduces integrals. The series finishes off by introducing the Taylor Series and approximating functions. If these names seem foreign to you, then it is okay. They were unfamiliar for me as well, but this series succinctly gave me an intuitive foundation for all of these topics. Now when I take a rigorous course in calculus, I will have a solid foundation to work off of.

What drew you to this book?

This series was in my recommended feed. The thumbnail was attractive, and so I clicked on it. The voice of the narrator was calm and soothing. The narration, music, and animations just complimented each other very well and I couldn't stop watching the series. Calculus was also something I had heard of and studied before, but I never really had an intuitive understanding of it. Therefore, this series interested me greatly. It was entertaining, yet also very educational and useful in my future mathematical studies. I am also generally interested in math and try to seek various math related

things outside of school. The combination of all these factors led me to watch all of this series in one day.

Did it remind you of something that you've previously read?

It doesn't specifically remind me of something that I have previously read or watched. But overall, I feel that this series is reflective of the general trend in mathematics and educational YouTube. Teaching and learning mathematics today are more about intuition and understanding rather than the rote memorization of formulas and I think the educational math channels on YouTube are reflective of that trend. From Eddie Woo to Sal Khan, to Numberphile, all of these people and channels today aim to teach math in a more intuitive and entertaining way. In that sense, 3Blue1Brown and this series are just following this trend. Many of the qualities associated with this series, the visual animations, the focus on intuition, and the enthusiasm of the presenter, were similar to all of these other people and channels.

To whom would you recommend this book?

I would recommend this series to anyone remotely interested in math and science. Calculus is a topic that is involved in many different disciplines. So, if you are interested in economics, or physics, you should watch this series as well. I also feel that this is a good introduction, so it would be helpful to watch this before you take an actual calculus class at school or college. Anyone who likes critical thinking and wants a fun little series to watch should check out this series.

Overall, did you like it and would you recommend it to others?

Overall, I enjoyed this series a lot and would certainly recommend it to others. Again, the interplay between the music, narration, and animations made the series feel more like a T.V. show or mystery movie rather than a series of math lectures. Everything was very well done, and the explanations were succinct and clear. It really did touch upon all of the basic points of this vast subject. I doubt there is a better calculus series out there. This one really focuses on visual intuition. This is helped by the amazing production quality and computer animations. Math is taught and presented in a very unique way that I have not seen anywhere else. I don't really have any negative criticism. My one little nitpick would be that the videos themselves could involve more audience interaction, maybe with some practice problems. But that isn't really the goal of the series anyways and plenty of practice can be found on other websites.

Anything else that you would like to add to this review? What made you choose it? Did you like the cover? Was it recommended to you? Did you find it at the library?

I was looking for something like this, and when I found it on amazon I ordered it immediately. I was not disappointed. It was a fabulous thing to read this past summer, the perfect book to bring to a bench in the park.