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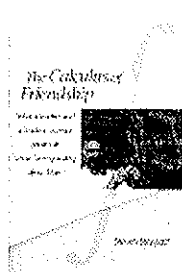
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## MAA Reviews

### The Calculus of Friendship: What a Teacher and a Student Learned about Life while Corresponding about Math

Steven Strogatz



**Publisher:** Princeton University Press (2009)

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## MAA Review

[Reviewed by Darren Glass, on 10/02/2009]

Anyone who has spent a significant amount of time as an educator knows about the special relationship that can develop between a teacher and a student, which can be especially striking when the relationship evolves and the student becomes the teacher. I know that I have former teachers — as well as former students — who I have kept in touch with long after our professional relationship was over, and these relationships are some of the most important in my life even to this day. Steven Strogatz, who is probably most well known for his book *Sync* as well as his contributions to the fields of chaos and dynamical systems, has written about one such relationship in a marvelous new book.

In *The Calculus of Friendship*, Strogatz writes about his relationship with Don Joffray and how it evolved over thirty years of letter writing from the time that Joffray taught Strogatz calculus at *Loomis Chaffee*, a prep school in Windsor Connecticut. The friendship between these two men was based largely on their love of mathematics in general, and calculus in particular. Over time they slowly revealed more and more of

their personal lives with one another, but the bulk of their letters are devoted to discussing mathematics and the bulk of the book is devoted to reprinting the letters. For example, Strogatz barely mentions his first marriage or divorce to Joffray and Joffray only writes of his son's death in passing. On the other hand, they spend page after page writing about [Hero's formula for the area of a triangle](#) or [Wallis's formula for  \$2/\pi\$](#) .

Most of the chapters begin with Strogatz setting up a batch of letters by catching the readers up with the next phase of his life, or of Joffray's, to fill us in on the autobiographical background of the two men that they tend not to share with each other. Often he uses various mathematical topics — ranging from chaos theory to the 'Monks on a Mountain' problem from a calculus course — as metaphors for life and for their relationship. OK, I know what you're thinking, but somehow this is not as painful as it sounds, and Strogatz is able to get away with this type of writing in a way that feels both natural and heartwarming:

Yet in another way, calculus is fundamentally naive, almost childish in its optimism. Experience teaches us that change can be sudden, discontinuous, and wrenching. Calculus draws its power by refusing to see that. It insists on a world without accidents, where one thing leads logically to another. Give me the initial conditions and the law of motion, and with calculus I can predict the future — or better yet, reconstruct the past. I wish I could do that now.

As time continues to pass, Strogatz and Joffray slowly reverse their roles as teacher and student, and the evolution of their relationship is beautiful to watch. The affection that they have for each other shines through in their letters, whether they are talking about mathematics or teaching or kayaking. Most importantly, the 'characters' (if that is the right term for two people in a nonfiction book) are as well developed as one would find in any novel, and both Strogatz and Joffray come across as people I would genuinely want to know — and to learn mathematics from.

While this is a book that contains quite a few equations and diagrams, most mathematically inclined readers probably won't learn a lot of new mathematics from *The Calculus of Friendship*, as the problems that Joffray and Strogatz write are for the most part standard gems of the field. More specifically, the title of the book is not to be taken literally, as Strogatz does not model friendship mathematically — although readers interested in that topic might want to check out [Strogatz' column from the NY Times this past summer on mathematical models of love](#), or otherwise look to the (fictional) book by Charlie Eppes on *Numb3rs* entitled *Friendship: As Easy as Pi*. However, while the mathematics itself may not be new it is still a joy to read, and I really enjoyed reading mathematics done as an exploratory dialogue in the way that many of us actually work.

If I haven't been clear already, let me say that I loved this book, and I devoured it in a single evening. I immediately recommended it to my colleagues, and I plan to show portions of it to my students the next time I teach calculus. However, I am not sure how this book would be received by people who are not interested in reading about mathematics. Yes, it got good blurbs from Alan Alda and John Cleese and a glowing review on the book review website [Bookslut](#), but with equations appearing on two out of every three pages it is hard for me to imagine recommending the book to someone who is not at least passingly familiar with — and interested in — mathematics. However, it is exactly the kind of book I would like non-mathematicians to read, as the leisurely way

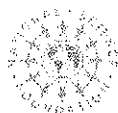
that Strogatz and Joffray write about problem solving in general as well as solve particular problems is more illustrative about how certain kinds of mathematics is done than anything I have ever read. And ultimately, this is not a book about mathematics but rather a book about friendship and mathematics and the way they are intertwined in the lives of these two men. This might sound strange to some people, but I think Strogatz puts it best when argues that a love of calculus is no stranger a thing to build a friendship off of than a love of opera or of baseball: "For them [calculus] is more than a science. It is a game they love playing together — so often the basis of friendship between men — a constant while all around them is in flux."

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Darren Glass is an Associate Professor of Mathematics at Gettysburg College. While reading this book, he kept thinking about the lifelong relationship he had with one of his high school teachers, Steve Sigur, who passed away last July. This review is dedicated to Steve. I miss you.

## Reader Reviews

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