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

By Steven Strogatz



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The Calculus of Friendship is the story of an extraordinary connection between a teacher and a student, as chronicled through more than thirty years of letters between them. What makes their relationship unique is that it is based almost entirely on a shared love of calculus. For them, calculus is more than a branch of mathematics; it is a game they love playing together, a constant when all else is in flux. The teacher goes from the prime of his career to retirement, competes in whitewater kayaking at the international level, and loses a son. The student matures from high school math whiz to Ivy League professor, suffers the sudden death of a parent, and blunders into a marriage destined to fail. Yet through it all they take refuge in the haven of calculus--until a day comes when calculus is no longer enough.

Like calculus itself, *The Calculus of Friendship* is an exploration of change. It's about the transformation that takes place in a student's heart, as he and his teacher reverse roles, as they age, as they are buffeted by life itself. Written by a renowned teacher and communicator of mathematics, *The Calculus of Friendship* is warm, intimate, and deeply moving. The most inspiring ideas of calculus, differential equations, and chaos theory are explained through metaphors, images, and anecdotes in a way that all readers will find beautiful, and even poignant. Math enthusiasts, from high school students to professionals, will delight in the offbeat problems and lucid explanations in the letters.

For anyone whose life has been changed by a mentor, *The Calculus of Friendship* will be an unforgettable journey.

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Editorial Review

Review

"An intimate view of mentorship is revealed by US mathematician Steven Strogatz in *The Calculus of Friendship*, a compilation of letters exchanged with his high-school math teacher over 30 years. Through their correspondence they share problems in calculus, chaos theory and major life events, from professional and sporting successes to family bereavements and divorce. The book touchingly charts their changing roles and relationship, from student to professor, teacher to retirement."--*Nature*

"The spring of his freshman year in college, Strogatz began to exchange letters with his high school calculus teacher, Don Joffray. At some point, their amiable correspondence about math problems led to a true friendship. In *The Calculus of Friendship*, Strogatz weaves their letters into reflections on the philosophical similarities between calculus and human relationships and portrays a friendship firmly founded on a love of dreaming up and solving calculus problems . . . One can also feel the personality and humor of these pen pals emerging through their symbol-sprinkled sentences."--*Science*

"Part biography, part autobiography and part off-the-beaten-path guide to calculus, this quick read details 30 years of correspondence between Strogatz and Joffray. Calculus, Isaac Newton's ingenious invention for modeling change mathematically, serves as both text and subtext for the letters that pass between Strogatz and Joff. Focusing almost exclusively on questions of mathematics, these brief notes frame the unlikely friendship of a teacher and his star student. With the precision of an award-winning mathematician and the clarity of a best-selling science author, Strogatz leads us on an excursion through some of the lesser-known mathematical sights--the ones usually reserved for the 'members only' tour. . . . The mathematics covered in these letters is impressive for such a short volume."--*American Scientist*

"There is no better English-language explicator of complex quantitative concepts than Steven Strogatz. His work is a model for how mathematics needs to be popularized."--Michael Schrage, *Harvard Business Review*

"This story will draw in both the novice and the veteran. Teachers of mathematics will appreciate the longterm effect their teaching can have on students. The included mathematics can be related to both high school and undergraduate calculus sequences to demonstrate some interesting, thought-provoking, and 'big picture' connections to these courses."--Mathematics Teacher

"[A] beautiful book, bound to become a classic in the mathematical literature. . . . Like Hardy's *A Mathematician's Apology*, you don not have to know any mathematics whatsoever to read this book. It is a candid and all-too-human story told with brutal honesty, warts and all, sharing with the reader the elation and sincere regrets bound up in the relationship--but in the end, the victories, too. With some beautiful mathematics throughout!"--Lawrence S. Braden, *Notices of the American Mathematical Society*

"You wouldn't guess it from the title, but *The Calculus of Friendship* is a genuine tearjerker. I defy anyone to follow the correspondence between mathematician Steven Strogatz and his high school teacher Don Joffray (affectionately nicknamed 'Joff') without getting just a little lachrymose. If you don't, check to see if there is a heart in your chest. If there is, ensure that it's not just a cold slab of stone."--Bookslut

"The story of the correspondence between these two men is at once charming and subtly powerful. Strogatz

writes directly and honestly, telling the story of a slow-growing friendship that was at once somewhat stilted and yet deep and sustaining. The immediacy and intimacy of Strogatz's writing transform the pleasures and tragedies of normal life into the elements of a compelling narrative, and because the book works so well on this human level, it also very effective in presenting some important lessons about education and about mathematics."-*Mathrecreation blog*

From the Back Cover

"As these two men find truer, deeper friendship through an exchange of letters on math, you may be surprised to find yourself, as I was, moved by powerful emotions. I never thought I'd get choked up by an equation--but these guys are plotting out the hardest kind of change to track: the movement from Me to Us."--Alan Alda

"*The Calculus of Friendship* is an intriguing journey that casts mathematics in a most unusual light. Through thirty years of correspondence between student and teacher, we enter a private world where the rigors of logic are the last defense against the vagaries of life."**--Brian Greene, author of** *The Elegant Universe*

"In this delightfully inspired account of a thirty-year correspondence, two mathematicians discover even deeper things than theorems that are fundamental. A math book for the mind and for the heart."--Larry Zimmerman, winner of the 1986 Presidential Award for Excellence in Mathematics Teaching

"Steven Strogatz has written an unpretentious, charming, original, and inspiring book. In a disarmingly personal depiction, Strogatz leads us through a story of friendship between understated mentor and virtuosic student. The mathematical excursions are as much a pleasure to read as the moving narrative of the unusual friendship that the mathematics inspires."--Janna Levin, author of *A Madman Dreams of Turing Machines*

"It is unusual for mathematicians to write in such personal terms and with such candor. Readers with any mathematical background will find this book intriguing and fascinating."--John Adam, coauthor of *Guesstimation*

"The gentle but unremittingly honest account of this friendship utterly absorbed me. Also, some of the calculus is hilarious."--John Cleese

"Containing many mathematical morsels, this decades-long correspondence tells the story of a very special student-teacher relationship. These men have taught each other more than they could ever have envisioned."--Adrian Banner, author of *The Calculus Lifesaver*

"Mathematics speaks to the transcendental, as does this extraordinary friendship. A beautiful book!"--James Tanton, founding director of the St. Mark's Institute of Mathematics

"This is a lovely book. Strogatz succeeds in producing a sincere tribute to teachers, and he emphasizes in a direct way the human element of mathematics."--Barry Cipra, author of *Misteaks...and How to Find Them before the Teacher Does: A Calculus Supplement*

About the Author

Steven Strogatz is the Jacob Gould Schurman Professor of Applied Mathematics at Cornell University. His books include the best-selling "Sync: The Emerging Science of Spontaneous Order" (Hyperion). He has written for the "New York Times"'s Opinionator blog.

Users Review

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Charles Beaudoin:

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