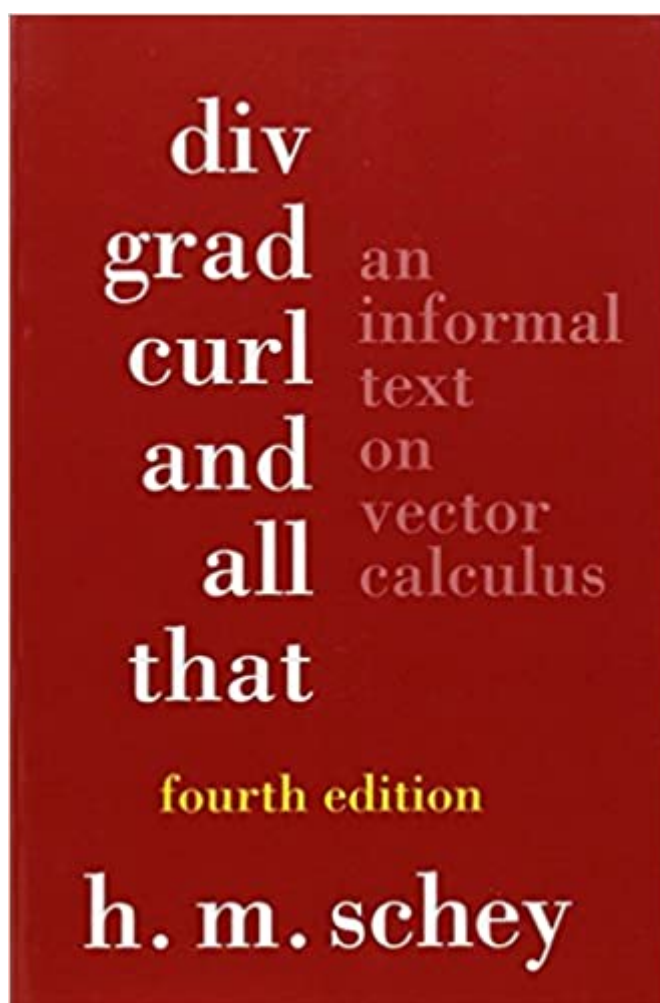




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# Div, Grad, Curl, And All That: An Informal Text On Vector Calculus (Fourth Edition)



## Synopsis

This new fourth edition of the acclaimed and bestselling *Div, Grad, Curl, and All That* has been carefully revised and now includes updated notations and seven new example exercises. Since the publication of the First Edition over thirty years ago, *Div, Grad, Curl, and All That* has been widely renowned for its clear and concise coverage of vector calculus, helping science and engineering students gain a thorough understanding of gradient, curl, and Laplacian operators without required knowledge of advanced mathematics.

## Book Information

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## Customer Reviews

H. M. Schey is Professor of Mathematics and Statistics at the Rochester Institute of Technology.

Great book for my Electromagnetic Fields course. This book goes into great detail to ensure the reader fully grasps the materials presented using great examples from Electrostatics.

This lovely book is an excellent introductory text in vector calculus. It is suitable for students because it is written in informal but alluring and almost strict and severe manner, and because it covers all for them indispensable theory together with its applications. Each chapter is provided with a excellent examples and problems at the end of it. Solutions to almost all of problems are given at the end of the book. Greatest worth of the book is, in my opinion, that it gives a thorough physical background of the theory. I think that mathematicians, physicists and engineers can really benefit

from this text by finding a lot of interesting for them inside it, like Maxwell's equations and much more.

I took a multivariable calculus course in college and found myself having to revisit the material several years later. I was a theoretical computer science student in graduate school, and am no stranger to mathematical rigor. I found this book exceptionally useful for developing an intuitive understanding of what these operators do (as the title suggests) and equations such as the Laplace and Poisson equation (although I feel like an understanding of complex analysis and the calculus of variations goes a very long way in truly understanding what it means to obey these equations). The development of electro/magnetostatics and the (static) Maxwell's equations on the side is a great added bonus (plus, I believe a lot of these tools were developed for this particular application) - also, it's nice to see real world examples of the concepts. I don't fully agree with the other reviewers that say this is a good book for engineers - a more rigorous treatment should be mandatory for anyone in science or engineering (note: I'm currently doing electrical engineering graduate work). For people learning the material for the first time - this would be a fantastic add-on for a more rigorous treatment from another book. It also makes for an excellent review for people who need to brush up (like I did) on vector calculus. The figures in particular are simple, yet very effective in explaining the concepts. Either way, it's a must have for any applied scientists/engineers/math teacher's shelf.

Great book for anyone studying multivariable calculus, physics, engineering, etc. It explains the principles and concepts, the trigonometry, the geometry, in plain language, while perfectly tying it in with the math. It puts all of the details of the textbooks in perfect perspective. Highly recommended.

This is a wonderful overview of vector calculus, presented in a very easy-to-read, sometimes humorous manner. I can't speak for other disciplines, but as a mechanical engineer I found this book to be amazingly easy to understand and a very helpful review of vector calculus. My multivariate calculus professor was an outer space theoretical mathematician who couldn't explain physically what "flux" is, let alone the higher concepts of divergence, gradient, and curl, so working my way through this book made a lot of fundamental concepts click for me. Schey takes his time explaining all the concepts of vector calculus, in the context of Maxwell's equations, without the formality/rigorousness in "proper" math texts- even the definitions and proofs of the main theorems are explained from a physical standpoint. Indeed, Schey remarks that "rigorous" is just a synonym for "useless". The emphasis is on learning the concepts intuitively and physically, rather than just

memorizing formulas. I think this would be a wonderful supplement (for engineers) to a traditional calculus course- but not really that great for learning the material for the first time. I very highly recommend this book as a refresher, especially if you are a graduate student and you are just expected to know everything about vector calculus like the back of your hand.

This book does it all. Without being overly verbose, it explains div, grad, and curl in concepts clearer and maybe even more precise than you would see in some upper level vector analysis classes. The integral definitions for grad and curl are given and well-justified. Homework problems and a number of examples from E&M give practice and application. It's an easy read, relatively cheap, and I think it's great supplementary material for any math or physics student.

Schey's book has a very awkward beginning. Instead of taking the normal, sensible, incremental approach - by exposing readers to the gradient vector function first, followed consecutively by Divergence, Curl and the Laplacian, he immediately begins by explaining fluxes and the methods by which they are calculated. Not only is this jarring because line integrals (by virtue of being the arc length analog of vectors) are more suitable, but it also lacks the clever intuitive 'click' I craved. By the time I was done reading the final chapter on gradients (which should have been the first chapter) I felt as if I had merely revised my vector calculus textbook. In other words, if you are looking for intuition, look elsewhere. This book has all the mathematical rigor of a children's book.

My prof for structural geology told me to get it. I've learnt all this in my math class, but this provides a very concise, easy to read, easy to refer to kind of handbook with examples.

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