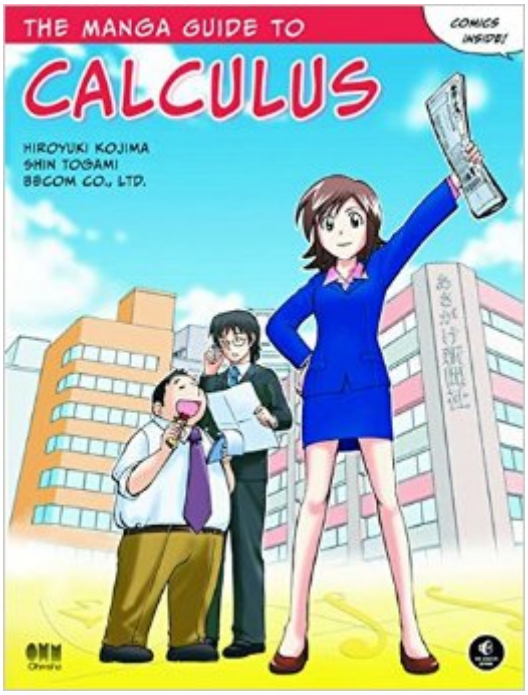
The Manga Guide To Calculus



Synopsis

Noriko is just getting started as a junior reporter for the Asagake Times. She wants to cover the hard-hitting issues, like world affairs and politics, but does she have the smarts for it? Thankfully, her overbearing and math-minded boss, Mr. Seki, is here to teach her how to analyze her stories with a mathematical eye. In The Manga Guide to Calculus, you'll follow along with Noriko as she learns that calculus is more than just a class designed to weed out would-be science majors. You'll see that calculus is a useful way to understand the patterns in physics, economics, and the world around us, with help from real-world examples like probability, supply and demand curves, the economics of pollution, and the density of Shochu (a Japanese liquor). Mr. Seki teaches Noriko how to: Use differentiation to understand a function's rate of changeApply the fundamental theorem of calculus, and grasp the relationship between a function's derivative and its integralIntegrate and differentiate trigonometric and other complicated functionsUse multivariate calculus and partial differentiation to deal with tricky functionsUse Taylor Expansions to accurately imitate difficult functions with polynomials Whether you're struggling through a calculus course for the first time or you just need a painless refresher, you'll find what you're looking for in The Manga Guide to Calculus. This EduManga book is a translation from a bestselling series in Japan, co-published with Ohmsha, Ltd. of Tokyo, Japan.

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Customer Reviews

The Manga Guide to Calculus follows the actions of a young newspaper reporter, Noriko, who wants

to cover the big stories, to be a hard-hitting reporter who uncovers and reveals hidden facts about world affairs, the economy, and politics. She is saddened to discover that she has been assigned to work a small post in a small area where she is unlikely to find stories bigger than the opening of a local amusement park or the improving reputation of a local watermelon grower.However, her time is not wasted. The bureau chief is a lover of mathematics, and specifically calculus. Noriko is shocked to discover that calculus can help her become a better reporter by assisting her to discover trends in data that might otherwise have been overlooked.This story line makes the discussion of very complex and sometimes difficult to grasp mathematical concepts much easier by framing the discussion in ways I have never seen. In my experience, a typical calculus class will start with mechanics like how to compute a derivative or somewhat esoteric sounding concepts like lines tangent to curves without giving a clear background as to why these things might be meaningful or useful. That usually comes much later, after a large number of students have been weeded out because of disinterest or an unwillingness to learn difficult concepts without knowing why they might be important.What this book does better than any calculus book I have seen is give a context to the processes and concepts. The story line is enjoyable, but more importantly it serves the function of enabling a reader to understand how the mathematics help solve problems or answer questions that are useful and relatable. That in itself is a great and useful accomplishment and makes the book worthy of a recommendation.The book covers a large number of concepts. As a result, none are covered in exhaustive depth. I would not consider this a primary text or useful for learning calculus alone, but rather as an accompaniment to a course, useful for review or assistance in understanding concepts as they are learned.Some of the topics covered are using functions to approximate data, such as fluctations or trends in prices, calculating relative error and calculating the derivative of constant, linear, quadratic, composite, inverse and other functions. Norika learns how to use different techniques for differentiation while discovering the importance and usefulness of knowing the maxima and minima for a given formula. Not long after these and other foundational aspects are learned, Norika finds out about the fundamental theorem of calculus and learns to integrate using supply and demand curves and later trigonometric functions. Finally, she discovers Taylor Expansion, distributions, and partial differentiation, especially as applied to economics.The book includes exercises in each section with solutions in the back of the book. Again, there aren’t enough practice problems for this to be useful as a primary teaching text, but what is there is useful for confirming that the concept just discussed is clearly understood and would be helpful as a review.I would have preferred to see more examples of calculus in use in other sciences, like physics, but this is a short book that is intended to be an overview of the topic and not an extensive or

exhaustive presentation. It is also fair to note that the Manga Guide to Physics does use some calculus in it, although not much. These are books aimed at people finishing high school or just starting at the university and I think they hit their target well, confining themselves to discussions within well chosen boundaries to make sure that the intentionally and necessarily narrower set of concepts may be discussed clearly and completely enough for good understanding.

This beautifully illustrated Manga Guide To Calculus, has the merits of a real Manga story, professional Japanese illustration, and many excellent physical analogies and references to diverse fields (like economics) that provide excellent intuition into the application of these mathematical techniques. With a wide but somewhat conventional coverage of the mathematical topics, this guide provides a full treatment of Differential and Integral Calculus, including topics not conventionally provided in an introductory primer--such as Partial Derivatives and the Taylor Series. The presentation of actual mathematical techniques is not as slow going or example driven as I might have expected in a comic-based text. But the illustrations and references to physical intuition make it invaluable as a supplementary text for the high school and college curriculum.I had been expecting a gentle ride illustrated with Manga reminiscent of Prof. E. McSquared's Calculus Primer an earlier and classic Mathematical Comic--what this volume delivers is a complete approach to a wide range of calculus topics using conventional college instruction methods accompanied by excellent Japanese illustrations and diverse analogies to elicit physical intuition. It is an altogether worthwhile guide to the calculus.

I have got to say, I am quite impressed with The Manga Guide to Calculus. As the title suggests, it is an introduction into the ideas of differential and integral calculus through the use of manga and a story line. The book fulfills on this goal and then some.The Manga Guide to Calculus starts off with a brief introduction and review of functions. It then jumps right into derivatives, what they mean, and how to compute them. Integration is then considered along Taylor series and partial differentiation. Throughout the story, the guide frequently references real world applications in economics, physics, and chemistry, and explains problems in these fields through the use of calculus. The author also includes probability, statistics, and trigonometry sections with calculus explanations. Exercises exist at the end of each section for you to complete and solutions are presented at end of the book.There are a few downsides to the manga style of presentation. Formal proofs and definitions do not lend themselves well to be included, and the book is certainly lacking in this area. There may also be some areas which the reader will have to go over a few times to fully understand and see how the

book goes from one idea to the next because of the amount of information being presented.I would recommend this book to those who want a brief review of calculus, beginners who want context as to its uses, and to those who enjoy reading a good math book. This book is not for those who need a thorough review since many important topics are skipped such as limits, related rates, and volumes of rotations. Overall, Hiroyuki Kojima and Shin Togami did an excellent job in writing and illustrating the book respectively, which makes The Manga Guide to Calculus a very different and attractive learning tool.

This book follows the same great approach as the Manga Guide to Physics: Break a complex idea down in to small pieces, clearly explain it with practical examples, and use the fun Manga comic style to wrap the entire concept in a great story.I never took calculus in high school or college, yet I was able to get through the Guide and come out at the end with a pretty fair understanding of it. Moreover, I actually enjoyed the learning journey!My nine year-old daughter loves these books and always reads through them after I'm done. She's not coming away from the books with great knowledge of the concepts, but she's finding them interesting, fun, and is less intimidated with the subjects. I think that's a big win because these guides are laying some good ground work for her to come back to later.

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