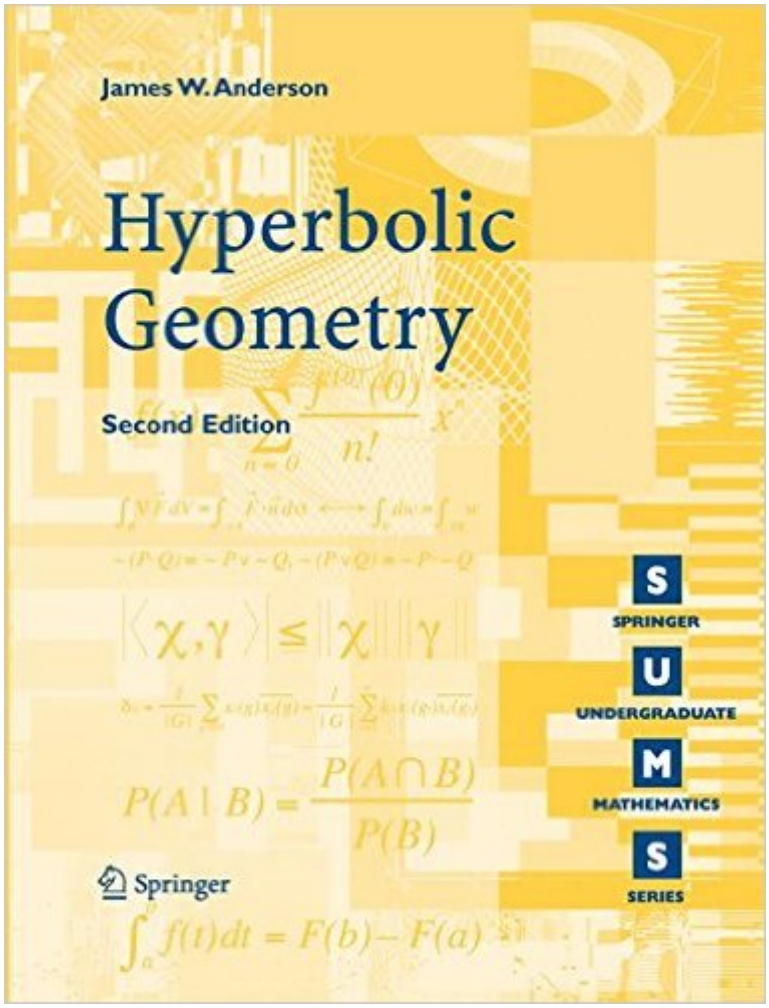
Hyperbolic Geometry (Springer Undergraduate Mathematics Series)



Synopsis

Thoroughly updated, featuring new material on important topics such as hyperbolic geometry in higher dimensions and generalizations of hyperbolicity Includes full solutions for all exercises Successful first edition sold over 800 copies in North America

Book Information

Series: Springer Undergraduate Mathematics Series

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Customer Reviews

I used this text along with Tristan Needham’s "Visual Complex Analysis" to get a full dose of the geometric beauty inherent in studying complex variables. I found it to be a nice complement to the second year course in geometry at Cambridge University. Anderson does a wonderful job of working out in detail lots of examples so that you can get the algorithmic practice of solving problems. However this is not merely a cookbook. Rather, core elements of the theory are presented from the ground up, with plenty of time spent on understanding the group structure of Mobius transformations in various settings. Disc and upper-half plane models are treated as well as more general models. I recommend you buy both this book and Needham’s if you want to appreciate the world of complex numbers.

This is an excellent introduction to hyperbolic geometry. It assumes knowledge of euclidean geometry, trigonometry, basic complex analysis, basic abstract algebra, and basic point set topology. That material is very well presented, and the exercises shed more light on what is being discussed. Plus, solutions to all the exercises are at the end of the book.

My review is based on the first edition.This book is a tour-de-force. While it is stated to be for undergraduates, I would caution that only those undergraduates with a solid grounding in calculus will be able to follow many of the technical details. To alleviate that, Anderson provides many examples and solutions to all the generally excellent exercises in his book. He does some lengthy calculations as well.His primary focus is on the upper half plane model H and its group Mob+ of Mobius transformations. He adopts Klein's viewpoint that the group and its invariants are primary. So it was a pleasure to see worked out in detail why |dz|/y (up to a positive constant multiple) is the Riemannian line element for H: It is the only conformal distortion of the Euclidean line element that is invariant under the group Mob+ (Theorem 3.5). He then works out the global metric on H.I was sorry to see from its table of contents that in the second edition he deleted his chapter about discrete subgroups of Mob acting on H and their fundamental polygons. He did replace it with a discussion of the hyperboloid model, which is important for special relativity.

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