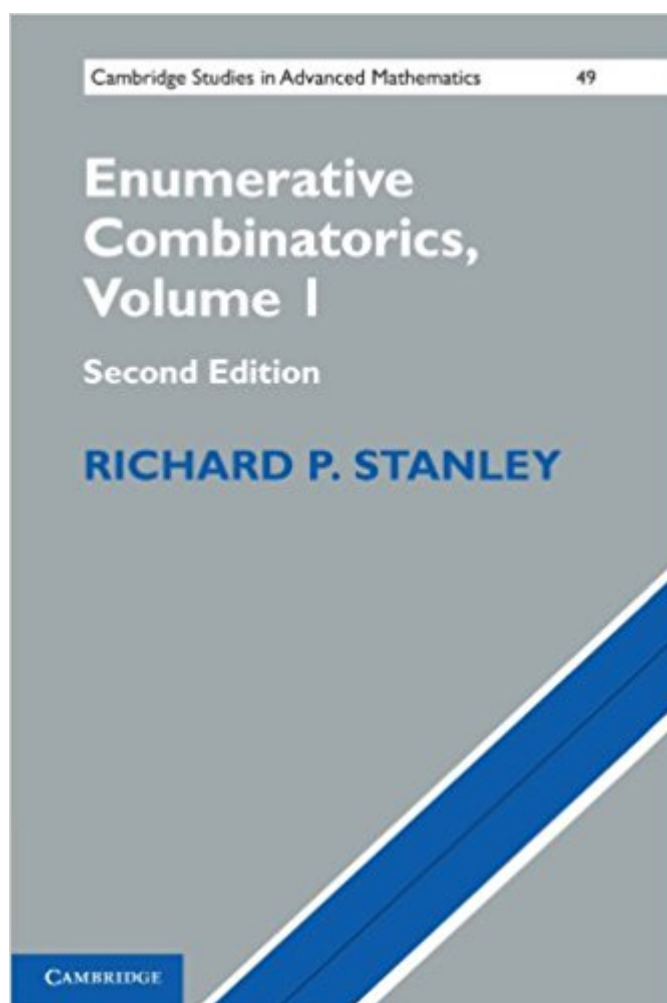


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# Enumerative Combinatorics: Volume 1 (Cambridge Studies In Advanced Mathematics)



## Synopsis

Richard Stanley's two-volume basic introduction to enumerative combinatorics has become the standard guide to the topic for students and experts alike. This thoroughly revised second edition of Volume 1 includes ten new sections and more than 300 new exercises, most with solutions, reflecting numerous new developments since the publication of the first edition in 1986. The material in Volume 1 was chosen to cover those parts of enumerative combinatorics of greatest applicability and with the most important connections with other areas of mathematics. The four chapters are devoted to an introduction to enumeration (suitable for advanced undergraduates), sieve methods, partially ordered sets, and rational generating functions. Much of the material is related to generating functions, a fundamental tool in enumerative combinatorics. In this new edition, the author brings the coverage up to date and includes a wide variety of additional applications and examples, as well as updated and expanded chapter bibliographies. Many of the less difficult new exercises have no solutions so that they can more easily be assigned to students. The material on P-partitions has been rearranged and generalized; the treatment of permutation statistics has been greatly enlarged; and there are also new sections on q-analogues of permutations, hyperplane arrangements, the cd-index, promotion and evacuation, and differential posets.

## Book Information

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## Customer Reviews

"The main difference between this edition and the first is the addition of ten new sections (six in

Chapter 1 and four in Chapter 3) and more than 350 new exercises." -Mathematical reviews

Richard Stanley's two-volume basic introduction to enumerative combinatorics has become the standard guide to the topic for students and experts alike. This thoroughly revised second edition of Volume 1 includes more than 300 new exercises, many with solutions, updated and expanded chapter bibliographies, substantial new material on permutation statistics, coverage of additional topic such as hyperplan arrangements and the cd-index, and a rearranged and generalized treatment of P-partitions.

Excellent book but very dense. Not meant for the novice, and a very hard read for even the intermediate. This book is meant to be "read" with pencil and paper in hand. The presentation clearly comes from an author who just loves to "count", and is an expert at it. The clarity of thought is appreciated. Some will appreciate the conciseness, others might wish for a little more explanation. The coverage is exhaustive and the book can also serve as a reference.

This is an excellent book on combinatorics, but it is quite difficult to understand--written for experts, not novices. The author often chooses a more general framework in which to present things, and this can make the material quite difficult to follow. But the rewards for the diligent reader are great. Occasionally I question how Stanley chooses to present a certain topic, but usually if I look closely enough, I see that there are deep reasons for his choice of notation or presentation. Some of the material in this book is easier than others; some of it depends on earlier chapters, but some stands on its own. People interested in partially ordered sets and lattices may want to jump ahead to that chapter--much of this chapter stands on its own, and it is an excellent exposition of that topic, and I think somewhat easier to understand than the rest of the book. The most precious thing about this book is that the author manages to provide several comprehensive frameworks for solving large classes of enumeration problems. Combinatorics seems a hodge-podge subject to many mathematicians, but Stanley manages to see it as a unified subject with a number of general theories and common techniques. This book is truly the only text I have ever read that has this perspective on the subject. I would recommend this book only to someone who has a strong background in mathematics and wants a challenging text that can take them to a deeper level of understanding. Students of combinatorics may want to take this book out of the library and read the introductory pages; there are some particularly useful comments right at the beginning. As a final note, the exercises in this book are also helpful and of diverse difficulty levels--and Stanley

classifies the exercises by their difficulty level. People who find this book difficult to follow may want still benefit from some of the easier exercises. Students wanting an easier-to-follow text might want to check out Cameron's "Combinatorics", or Wilf's "Generatingfunctionology". As a final note I would like to remark that this book is very reasonably priced, especially when you consider the wealth of material it contains.

This is a great book (for people with a good math background, not for the casual novice). But Stanley provides the book for free on his website as well -

I am what one of the reviewers called an arm-chair mathematician..While I do not believe, that this book is suitable as a first introduction to combinatorics, it is a great book for anyone, who is interested in the subject and has had some prior exposure. The formal mathematical prerequisites are quite minimal. The proofs are such, that after some thinking one can understand them - and they are always rigorous. If on some occasions, the author would have given a short hint, instead of simply saying "it is easily seen" this would have made the book even more readable (but even then, after enough thinking one does see, albeit maybe not easily...) All in all, very recommendable (I am referring to volume 1 only, I did not read volume 2) I have now ( March 2011) also read volume II. Once again, the formal prerequisites are not very high, but the proofs are definitely harder to understand than in volume I! While chapters 5&6 are still not too difficult, chapter 7 ( about symmetric functions) certainly is hard. A few additional lines of explanation would have made the proofs easier to understand - at least for an "arm chair mathematician"! The book contains many exercises with solutions (!!!), which I did not attempt, so I cannot comment on them. The book is virtually free of any typos, I counted maybe 10 harmless ones. I would still recommend volume II to anybody seriously interested in combinatorics, but it is definitely harder than volume I. Overall, my rating remains at "full score"!

I agree with the other reviewers. The book is a masterpiece on enumerative combinatorics. However, I am not so sure that it is a good book for a beginner. If you are a beginner, then you should read another book first, like John Riordan's book on "Combinatorial Analysis." Stanley's book is best suited for an advanced student who has a high level of mathematical mental maturity. The reason I say this is that in a few places Stanley's formalism, which is entirely appropriate for professional exposition, actually obscures the underlying simplicity of the mathematical ideas. We have all seen this in research papers, where a mathematician takes a trivial idea and "obscures" the

underlying simplicity with too much formalism. However, for an advanced student, the book has a high density of important ideas and methods.

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