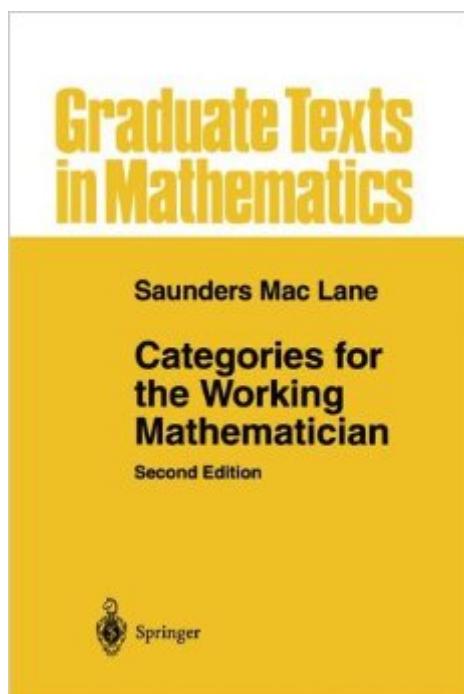


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# Categories For The Working Mathematician (Graduate Texts In Mathematics)



## Synopsis

An array of general ideas useful in a wide variety of fields. Starting from the foundations, this book illuminates the concepts of category, functor, natural transformation, and duality. It then turns to adjoint functors, which provide a description of universal constructions, an analysis of the representations of functors by sets of morphisms, and a means of manipulating direct and inverse limits. These categorical concepts are extensively illustrated in the remaining chapters, which include many applications of the basic existence theorem for adjoint functors. The categories of algebraic systems are constructed from certain adjoint-like data and characterised by Beck's theorem. After considering a variety of applications, the book continues with the construction and exploitation of Kan extensions. This second edition includes a number of revisions and additions, including new chapters on topics of active interest: symmetric monoidal categories and braided monoidal categories, and the coherence theorems for them, as well as 2-categories and the higher dimensional categories which have recently come into prominence.

## Book Information

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## Customer Reviews

Have you ever tried reading Descartes' "Geometry"? It's not a good place to learn about coordinate geometry. I tried. This was almost 10 years ago, but I still remember it pretty well. Ok, so maybe the experience was even a bit traumatic. Usually when someone works out a theory, it takes a fresh perspective (or two, or ... you get it) to really digest it, and come up with a reasonable way of

teaching it to newcomers. It's less evident nowadays, with improved communications technology and such, but people aren't exactly turning to Grothendieck's expositions as their intro to his geometry either. Mac Lane is an exception. This book seems completely inapproachable. The title is scary. The topic is scary. Open to a random page and try to judge its accessibility: scary. Well, here's the real story: you need to know algebra through modules, and it'd be nice if this algebra background introduced "universals" like abelianization or free modules in a way that involved the diagrams and the unique mappings you get from the given ones. If this stuff makes any sense, you can read this book. It's not that scary. If you're up to the challenge, you might even enjoy it. This is actually my favorite book. Here's the approach that I feel worked well for me:- gloss over the set-theoretic foundations at first. Make sure you know the proper class/set and large/small category distinctions, but don't dwell on them much.- focus on the examples that are familiar, but read through the others too. Mac Lane uses tons of examples to suit a variety of backgrounds, and his presentation is so clear that the theory can often explain the examples.- trust the author. It may seem like product or comma categories deserve fuller treatment with more motivation. No.

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