Cakes, Custard and Category Theory:
Easy Recipes for Understanding Complex Maths
by Eugenia Cheng

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John C. Baez

Department of Mathematics
University of California
Riverside CA, USA 92521

email: baez@math.ucr.edu

Eugenia Cheng has written a delightfully clear and down-to-earth explanation of the spirit of mathematics, and in particular category theory, based on their similarities to cooking. Sometimes people complain about a math textbook that it's "just a cookbook", offering recipes but no insight. Cheng shows the flip side of this analogy, providing plenty of insight into mathematics by exploring its resemblance to the culinary arts. Her book has recipes, but it's no mere cookbook.

Among all forms of cooking, it seems Cheng's favorite is the baking of desserts—and among all forms of mathematics, category theory. This is no coincidence: like category theory, the art of the pastry chef is one of the most exacting, but also one of the most delightful, thanks to the elegance of its results. Cheng gives an example: "Making puff pastry is a long and precise process, involving repeated steps of chilling, rolling and foldking to create the deliciously delicate and buttery layers that makes puff pastery different from other kinds of pastery."

However, she does not scorn the humbler branches of mathematics and cooking, and there's nothing effete or snobby about this book. No special background is needed to follow it, so if you're a mathematician who wants your relatives and friends to understand what you are doing and why you love it, this is the perfect gift to inflict on them.

On the other hand, experts may be disappointed unless they pay close attention. There is a fashionable sort of book that lauds the achievements of mathematical geniuses, explaining them in just enough detail to give the reader a sense of awe: typical titles are A Beautiful Mind and The Man Who Knew Infinity. Cheng avoids this sort of hagiography, which may intimidate as often as it inspires. Instead, her book uses examples to show that mathematics is close to everyday experience, not to be feared.

While the book is written in bite-sized pieces suitable for the hasty pace of modern life, it has a coherent architecture and tells an overall story. It does this so winningly and divertingly that one might not even notice. The book's first part tackles the question "what is mathematics?" The second asks "what is

category theory?" Unlike timid people who raise big questions, play with them a while, and move on, Cheng actually proposes answers! I will not attempt to explain them, but the short version is that mathematics exists to make difficult things easy, and category theory exists to make difficult mathematics easy. Thus, what mathematics does for the rest of life, category theory does for mathematics.

Of course, mathematics only succeeds in making a tiny part of life easy, and Cheng admits this freely, saying quite a bit about the limitations of mathematics, and rationality in general. Similarly, category theory only succeeds in making small portions of mathematics easy—but those portions lie close to the glowing core of the subject, the part that illuminates the rest.

And as Cheng explains, illumination is what we most need today. Mere information, once hard to come by, is now cheap as water, pouring through the pipes of the internet in an unrelenting torrent. Your cell phone is probably better at taking square roots or listing finite simple groups than you will ever be. But there is much more to mathematics than that—just as cooking is much more than a mere cookbook.