



BOOKSHELF

New and Noteworthy Titles on our Bookshelf
October 2021



MIT Press, 2021, 192 pages. Cover courtesy of MIT Press.

The Raven's Hat: Fallen Pictures, Rising Sequences, and Other Mathematical Games

by Jonas Peters and Nicolai Meinshausen

This entertaining book analyzes eight elementary games suitable for general audiences. For example, a team of players in the first game wear hats, each either red or blue, selected at random without their knowledge. They can see

each other, but not themselves, and they are not permitted to communicate. After a few moments, they must each answer "What is the color of your hat?", with the allowable answers being "red", "blue", or "?". The team wins if at least one player gives a correct answer, and none give an incorrect answer (question marks are not considered incorrect). What is the best strategy for the players? How likely are they to win the game, and how does this depend upon the number of players? These sorts of problems appear difficult at first, but a mathematical approach reveals solutions that are both enlightening and elegant. For example, the colored-hat game leads to a discussion of Hamming codes. Cartoon ravens appear frequently throughout the book, playing games or adorning graphs and figures.

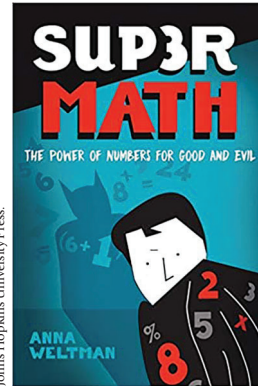
Each chapter of *The Raven's Hat* begins with a text box listing the number of players and requirements for the game. The authors discuss occasional variations on the games and provide extensive historical background. Once the "real world" game is discussed, the mathematical analysis begins. A background in high school mathematics should be sufficient to get started, although the book invites investigations into higher topics. A generous appendix covers a few topics (matrices, series, complex numbers, and so forth) that those with only a background in high school mathematics may not be familiar with. Predictably, most of the mathematics involved is of a combinatorial or

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probabilistic flavor, although excursions into information theory and even algebraic topology arise. The games and their solutions can often be presented in an undergraduate seminar or math club activity. Moreover, instructors of probability, game theory, or combinatorics might find some material here to spice up their courses with in-class activities.



Johns Hopkins University Press, 2020, 240 pages. Cover courtesy of Johns Hopkins University Press.

Supermath: The Power of Numbers for Good and Evil

by Anna Weltman

Supermath is the perfect book for that annoying relative who constantly asks, "what is the point of math?" It could also broaden the perspective of the jaded high school student who wonders what mathematics is all about. According to the dust jacket, *Supermath* "showcases the incredible power

of mathematics when people apply it outside of the world of pure numbers, introducing it into the realms of science, politics, history, education, and art."

Supermath is an inviting read for the layperson who might be open to being persuaded that mathematics is about more than tedious computations. The book discusses five fundamental questions about mathematics and its human component: "Is math the universal language?", "Can math predict the next move [an introduction to game theory]?", "Can math eliminate bias?", "Can math open doors?", and "What is genuine beauty?" The answers to these questions will be enlightening, entertaining, and surprising for the curious layperson. Topics discussed include old favorites such as Nash equilibria, Hardy's Apology, and the Pythagorean theorem, along with timely topics such as algorithmic bias, gerrymandering, and diversity in STEM.

The reviewer feels that *Supermath* could have used more images. Its single photograph and fifteen line drawings feel somewhat low for a book aimed at a general audience. Nevertheless, *Supermath* provides a low barrier of entry for those open to learning more about mathematics and its applications.