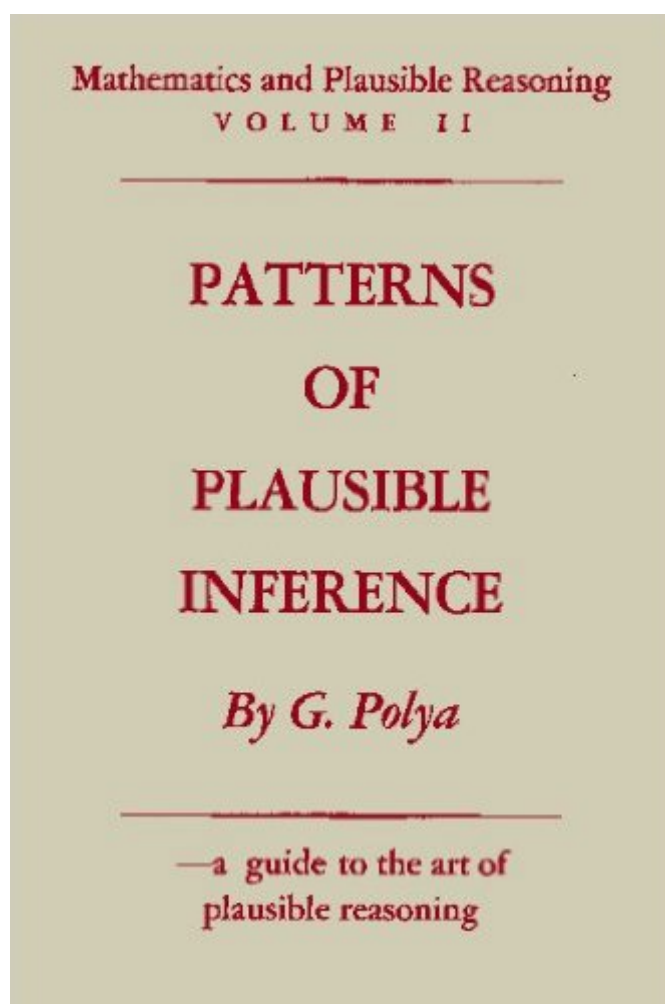


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Mathematics And Plausible Reasoning: Vol. II: Patterns Of Plausible Inference



Synopsis

This is a guide to the practical art of plausible reasoning, particularly in mathematics but also in every field of human activity. Using mathematics as the example par excellence, Professor Polya shows how even that most rigorous deductive discipline is heavily dependent on techniques of guessing, inductive reasoning, and reasoning by analogy. In solving a problem, the answer must be guessed at before a proof can even begin, and guesses are usually made from a knowledge of facts, experience, and hunches. The truly creative mathematician must be a good guesser first and a good prover afterward; many important theorems have been guessed but not proved until much later. In the same way, solutions to problems can be guessed, and a good guesser is much more likely to find a correct solution. This work might have been called "How to Become a Good Guesser." Professor Polya's deep understanding of the psychology of creative mathematics enables him to show the reader how to attack a new problem, how to get at the heart of it, what trains of thought may lead to a solution. There is no magic formula here, but there is much practical wisdom. Volumes I and II together make a coherent work on Mathematics and Plausible Reasoning. Volume I on Induction and Analogy stands by itself as an essential book for anyone interested in mathematical reasoning. Volume II on Patterns of Plausible Inference builds on the examples of Volume I but is not otherwise dependent on it. A more sophisticated reader with some mathematical experience will have no difficulty in reading Volume II independently, though he will probably want to read Volume I afterward. Professor Polya's earlier more elementary book How to Solve It was closely related to Mathematics and Plausible Reasoning and furnished some background for it.

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Customer Reviews

The author of this work has a special relationship to math. As people were trying to forcefeed me the subject over 50 years ago, what I mostly got was pure math, with no interest in how or whether math had any true real-world connections. There was a heavy emphasis on deductive, Euclidian proof. Polanyi is a breath of fresh air, because he is the first mathematician I have read who identifies insight and intuition as very important parts of math exploration. He identifies this element as guessing. Flat out. Math and science do not begin with formalized statements which are then studied and tested. They begin with someone's sense that there is something interesting to look at, poking around some, and THEN seeing if you can come up with a rule which might help predict, or explain an outcome.. sort of. The analytical part-- $E = MC^2$, for example-- comes after the intuition and the poking. What his work is about is getting better and the inductive part-- the improvement of guessing.

This is a continuation of the first volume on the same topic. He talks about plausible reasoning and helps researchers very much. I was most interested in problem solving though. I am nevertheless giving 5 stars because he does a good job of explaining plausible reasoning. In the last chapter (no. 16), he talks about the 'Deus ex machina' where a step in the proof of a tough problem appears as if the step was pulled out of a hat the way magicians do. In section 6, he explains it for a specific case but nevertheless the book does not provide ample examples of how such critical steps were pulled out of a hat. I feel that today, the only way to acquire that skill is to obtain proper mentorship from someone like Arthur Engel or Titu Andreescu. If you wish to understand plausible reasoning in math research, this book is very helpful and very well written.

Wonderful book; gave me tools to understand the process of critical reasoning, so necessary with the flood of today's news. (News?) So many opinions are floated on the TV and internet, it is important to sort out fact from fiction.

Every maths lover must keep this !! It is a book which motivate us do research in a systematic way!! written in a lucid manner!! Interactive also!!

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