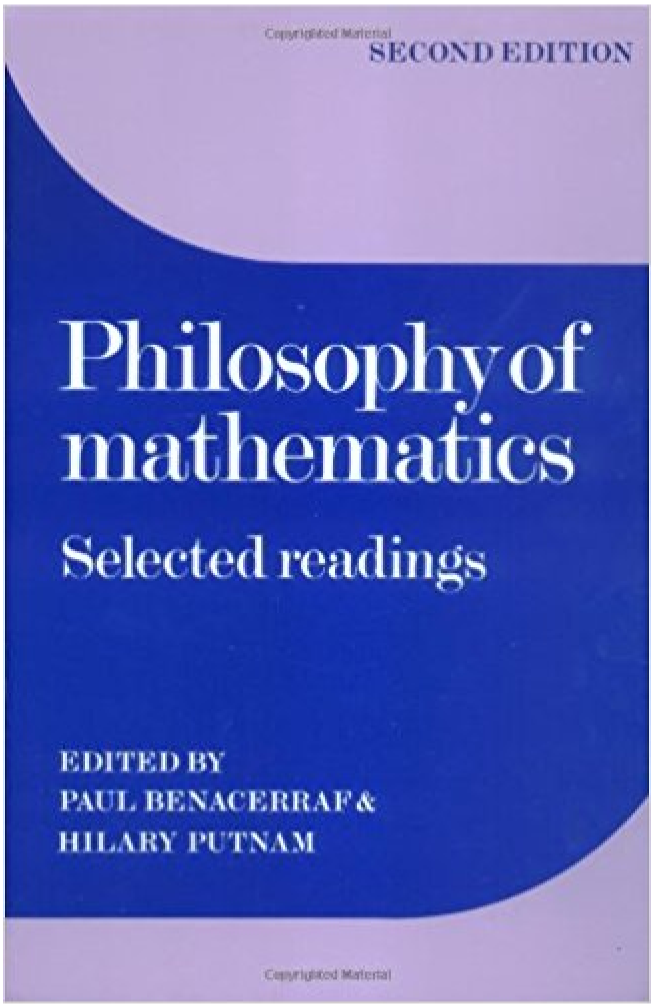
Philosophy Of Mathematics: Selected Readings



Synopsis

The twentieth century has witnessed an unprecedented 'crisis in the foundations of mathematics', featuring a world-famous paradox (Russell's Paradox), a challenge to 'classical' mathematics from a world-famous mathematician (the 'mathematical intuitionism' of Brouwer), a new foundational school (Hilbert's Formalism), and the profound incompleteness results of Kurt GÃƒÂ¶del. In the same period, the cross-fertilization of mathematics and philosophy resulted in a new sort of 'mathematical philosophy', associated most notably (but in different ways) with Bertrand Russell, W. V. Quine, and GÃƒÂ¶del himself, and which remains at the focus of Anglo-Saxon philosophical discussion. The present collection brings together in a convenient form the seminal articles in the philosophy of mathematics by these and other major thinkers. It is a substantially revised version of the edition first published in 1964 and includes a revised bibliography. The volume will be welcomed as a major work of reference at this level in the field.

Book Information

Paperback: 612 pages

Publisher: Cambridge University Press; 2 edition (January 27, 1984)

Language: English

ISBN-10: 052129648X

ISBN-13: 978-0521296489

Product Dimensions: 6 x 1.4 x 9 inches

Shipping Weight: 2.2 pounds (View shipping rates and policies)

Average Customer Review: 4.6 out of 5 stars 7 customer reviews

Best Sellers Rank: #221,478 in Books (See Top 100 in Books) #14 inÂ Â Books > Science & Math > Mathematics > Research #35 inÂ Â Books > Politics & Social Sciences > Philosophy > Methodology #1313 inÂ Â Books > Science & Math > History & Philosophy

Customer Reviews

Includes several classic essays from the first edition, a representative selection of the most influential work of the past twenty years, a substantial introduction, and an extended bibliography. Originally published by Prentice-Hall in 1964. -- Book Description

Includes several classic essays from the first edition, a representative selection of the most influential work of the past twenty years, a substantial introduction, and an extended bibliography. Originally published by Prentice-Hall in 1964.

The pro comments (that the book is definitive) as well as the con (that one needs some background in logic, math, phil to understand it) are both correct. I have a bare bones undergraduate grasp of philosophical issues & my math is inadequate, therefore I found numerous passages just in the introduction that challenged my patience, intelligence (such as it is) & will to absorb. My conclusion, however, is that the reward-to-work ratio is greater in this text than any other book I know of in contemporary philosophy. The results of the labor required has been an added measure of humility and enlightenment. In fact, I wish I could trade years I devoted to Nietzsche, Heidegger, Derrida, Foucault, Ayer, Rorty and even Wittgenstein (as pleasurable as all that was at the time) to get to this work earlier.No sterile polemics, Benacerraf & Putnam simply highlight the questions, the positions, the conundrums, & the costs of holding the various positions in these compelling debates around mathematical truth & understanding.This book is my vote for heavyweight champ in 20th century philosophy.

Excellent

The amazing thing about the little handful of books on Mathematical Philosophy--2 by Shapiro, Frege, Russell and of course Benacerraf and Putnam’s classic, is the paucity of literature in this key field!Some will say that mathematical philosophy, or the closely related philosophy of mathematics, only began in the 1980’s in earnest. But reading the "big 5" shows threads going back to antiquity. The field is far from settled, and the two aspects--the philosophy of math itself, and the closely related field of applying math and logic TO other branches of philosophy, has enough active journalized information in the mid 2014+ years to fill 50 volumes. Since thousands have been written in mainline philosophy, and even the philosophy of science as well as logic, this is not without surprise and mystery.The good news is that an invested, energetic reader can pick up this handful of keys and be in the top percent of folks on the planet with a good foundation! This is hardly true of any other field. I’d start with Shapiro’s Oxford Encylopedia, study Benacerraf and Putnam’s classic collection of essays, then finish with Shapiro’s deep and difficult "Thinking about" and of course Russell and Frege for historic and specialized puzzle pieces.One "sleeper" I’d like to recommend that is not usually included in comparisons of books in this field is Steinhart:Ã Â More Precisely: The Math You Need to Do Philosophy.Eric helps with both math within philosophy (the basics) and tangentially helps with the math used as examples within the philosophy OF math. Beyond the issues of categorization, discovery, math as model vs. underpinning reality ala the

Matrix, there of course is the whole field of logic, induction, deduction, etc. which has thousands of volumes. The six mentioned here cover logic, but are much more specific in the broader subject area of mathematics, which now includes dynamical systems and differential equations undreamt of in the past, and bringing many new mental tools to bear, from intuition to analytic, qualitative, numeric, perturbative and of course stochastic. Here are the other links to those mentioned in this survey:The Oxford Handbook of Philosophy of Mathematics and Logic (Oxford Handbooks)Thinking about Mathematics: The Philosophy of MathematicsPhilosophy of Mathematics: Selected ReadingsThe Foundations of Arithmetic: A Logico-Mathematical Enquiry into the Concept of NumberIntroduction to Mathematical PhilosophyEnjoy!

This is an excellent standard selection of classic works in the field; indeed, by now, that is something of a self-fulfilling prophecy, since inclusion in this anthology is approximately the definition of classic. The essays cover a broad range of positions, many of which (of course) I disagree with. But they're almost all well worth reading--my particular favorite is the unpopular part of Godel's Platonism, which is a useful antidote to overconfidence that these matters are settled.

This is a useful anthology. I shall not argue its merits or demerits, but rather submit the following thesis: the shortcomings of virtually all of these theories are traceable to their unwarranted identification of mathematics with 20th century axiomatic mathematics. Bernays asserts that since "the customary manner of doing mathematics ... consists in establishing theories detached as much as possible from the thinking subject," any contrary view is "extreme" (p. 267). "The customary manner of doing mathematics" is thus glorified: it is tacitly assumed that "the customary manner" will reign supreme for all future. Otherwise it would not be "extreme" to suggest that "the customary manner" may not be infallible. Now of course one does not infer the absolute truth of an economic theory from its successful account of one particular society. But precisely this is being done in the case of philosophy of mathematics.Let us begin with the ever-foolish logical positivists. They define their position against Mill, who "maintained that [mathematical] propositions were inductive generalizations based on an extremely large number of instances" (Ayer, p. 317). Incidentally we later see Hempel making the exact same argument (p. 378), the positivist herd being predictable as always. But back to Ayer. The argument against Mill is that mathematical propositions are unfalsifiable: "Whatever instance we care to take, we shall always find that the situations in which a logical or mathematical principle might appear to be confuted are accounted for in such a way as to leave the principle unassailed" (p. 319). Therefore, the doctrine goes, mathematical propositions are analytic a priori, they are true "by virtue of definitions" (Hempel, p. 379), "none of them provide any information about any matter of fact" (p. 321), their truth do not depend on "facts about the world" (p. 316). Putting aside for the moment the trivial objection that some scientific laws (such as the law of inertia) are also analytic, this is still trivially false. Consider the discovery of the binomial series and other power series in the 17th century. These were obviously tested. There is a tacit appeal to "the customary manner of doing mathematics" here again. We now know that power series can be embedded in an axiomatic system that makes them true "by virtue of definitions." But this is a fact of experience. Only "facts about the world" tell us that mathematical propositions are susceptible to such treatment, i.e., that "the customary manner of doing mathematics" is all-pervasive. The claim that mathematics is analytic is the claim that another world would be impossible. Here is another passage in Ayer which plainly presupposes "the customary manner of doing mathematics": "Appeal to intuition [is] a source of danger to the geometer. It has, indeed, been shown that Euclid himself was guilty of ... make[ing] assumptions which are accidentally true of the particular figure he is using as an illustration" (p. 325). So? Were these theorems false? No. Were the proofs incomprehensible? No. To prove that intuition is dangerous it is enough to prove that the reasoning involved differs from "the customary manner of doing mathematics." There is no need to show that intuition has ever led to a single error (indeed, no such proof is offered).The logisists are putting the cart before the horse in assuming logic to be prior to arithmetic and mathematics. Hempel (p. 380), for example, simply takes for granted that a=c is implied by a=b and b=c and that this is prior to arithmetic. The possibility is never considered that we may know the instances of the rule with greater certainty than the rule itself and that the latter depends on the former. Likewise the possibility is never considered whether the reduction of mathematics to logic may be vicious: if the rules of logic are abstracted from primitives (e.g., arithmetic) then it is not surprising that latter may be defined in terms of the former. This ignorance is due to the modern conception that there are some transcendent "rules of the game" fixed before any specific axioms have been chosen. Without this contingent fact about "the customary manner of doing mathematics" the logicist reduction would have no basis whatever. Indeed, looking at the matter with an open mind suggests that the reduction is absurd since "our logical intuitions ... are self-contradictory" (GÃƒÂ¶del, p. 452) whereas our arithmetical ones are not.Now let us look at the so-called "intuitionists." Their choice of "intuitions" has more to do with philosophical convenience than a serious study of intuition. For example: "However weak the position of intuitionism seemed after this period of mathematical development [i.e, non-Euclidean geometry], it has recovered by abandoning Kant’s apriority of space but adhering the more resolutely to the apriority of time." (Brouwer, p. 80). It is obvious that they care more about "the customary manner of doing mathematics" than about intuition in their treatment of geometry, which they dismiss as "reduce[able] ... to arithmetic by means of the calculus of coordinates" (Brouwer, p. 80). To put it extremely mildly, "it seems a bit hasty to deny completely the existence of a geometrical intuition" (Bernays, p. 264). Anyone seriously interested in intuition should do what PoincarÃƒÂ© did (not in this volume, of course), namely investigate the nature of geometrical intuition by means of detailed arguments. But Brouwer’s attachment to "the customary manner of doing mathematics" and his eagerness to create an ism precluded this.The third major philosophy of mathematics goes under the name of formalism. But this is a diverse crowd. On the one had there is Curry’s terribly naive position that "According to formalism the central concept in mathematics is that of a formal system" (p. 203). There is little point in noting how this captures "the customary manner of doing mathematics" and nothing else. On the other had there is Hilbert, who was not really advocating an ism at all. He was simply suggesting a research programme to prove the consistency of mathematics. This proposal was a very poor one, and of course one based on "the customary manner of doing mathematics," but it was no ism. This is why Curry thinks that Hibert’s position is "peculiar": "The peculiar position of Hilbert in regard to consistency is thus no part of the formalist conception of mathematics, and it is therefore unfortunate that many persons identify formalism with what should be called Hilbertism." (Curry, p. 206). Apparently it is "peculiar" not want to start an ism. "The part of mathematical activity concerned with a good choice of axioms had no place in Hilbert’s ’official’ conception of mathematics. If there is any real justification for calling Hilbert’s approach ’formalist’ it is certainly this deficiency of Hilbert’s official conception of mathematics and not his use of syntactic formulation in the foundations of mathematics." (Kreisel, p. 226). In other words: the only justification for calling Hilbert’s approach formalist is to interpret is as an ism, even though it was never intended to be one.

$971.04??!??? Gimme a break!

Introduction to Philosophy with Readings Philosophy: A Historical Survey with Essential Readings (Philosophy & Religion) Thinking about Mathematics: The Philosophy of Mathematics Strunk's Source Readings in Music History: The Nineteenth Century (Revised Edition) (Vol. 6) (Source Readings Vol. 6) Crafting and Executing Strategy: Concepts and Readings (Crafting & Executing Strategy: Text and Readings) Readings of the Lotus Sutra (Columbia Readings of Buddhist Literature) Political Psychology: Key Readings (Key Readings in Social Psychology) Fractal Geometry and Dynamical Systems in Pure and Applied Mathematics I: Fractals in Pure Mathematics (Contemporary Mathematics) Business Ethics: Case Studies and Selected Readings (South-Western Legal Studies in Business Academic Series) Economics of the Environment: Selected Readings (Sixth Edition) Spiritual Classics: Selected Readings on the Twelve Spiritual Disciplines Readings in Baptist History: Four Centuries of Selected Documents Devotional Classics: Revised Edition: Selected Readings for Individuals and Groups