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GINA HURLEY

Reckonings Cambridge University Press
Looking for a way to challenge your gifted students in math class? Look no further! Beyond Base Ten investigates the concept of place value and the representation of numbers by using place value and non-place-value systems. Number bases other than Base Ten are featured, especially through historical contexts of early civilizations that developed number systems different from the one we use today. Place value is a fundamental and powerful concept that is the foundation for the number system used by all cultures. Typical curriculum materials address this concept in a rote method. This unit goes beyond this and encourages students to analyze the structure of our number system and other systems; examine the historical foundations of place value systems (Babylonian and Mayan) and non-place-value systems (Roman and Greek) over thousands of years in different civilizations; analyze why Base Ten is the surviving number system; and investigate applications of other number bases in areas such as computers and electricity. Beyond Base Ten is perfect for any student who loves mathematics! Beyond Base Ten was developed by the Center for Gifted Education at The College of William and Mary. Grades 3-6
Making up Numbers: A History of Invention in Mathematics Courier Corporation
Concerned with the logical foundations of number systems from integers to complex numbers.
Number Systems CRC Press
Natural numbers, zero, negative integers, rational numbers, irrational numbers, real numbers, complex numbers, . . ., and, what are numbers? The most accurate mathematical answer to the question is given in this book.
Number Systems Courier Corporation
The subject of this book is the successive construction and development of the basic number systems of mathematics: positive integers, integers, rational numbers, real numbers, and complex numbers. This second edition expands upon the list of suggestions for further reading in Appendix III. From the Preface: ``The present book basically takes for granted the non-constructive set-theoretical foundation of mathematics, which is tacitly if not explicitly accepted by most working mathematicians but which I have since come to reject. Still, whatever one's foundational views, students must be trained in this approach in order to understand modern mathematics. Moreover, most of the material of the present book can be modified so as to be acceptable under alternative constructive and semi-constructive viewpoints, as has been demonstrated in more advanced texts and research articles.''
The Foundations of Analysis: A Straightforward Introduction American Mathematical Soc.
This treatment develops the real number system and the theory of calculus on the real line, extending the theory to real and complex planes. Designed for students with one year of calculus, it features extended discussions of key ideas and detailed proofs of difficult theorems. 1991 edition.
Symbolic Logic and the Real Number System Courier Corporation
Concise classic by great mathematician and physicist deals with logic and mathematics of set and function, concept of number and the continuum. Bibliography. Originally published 1918.
Finite Precision Number Systems and Arithmetic Academic Press
First published in 1982, this reissue contains a critical exposition of the views of Frege, Dedekind and Peano on the foundations of arithmetic. The last quarter of the 19th century witnessed a remarkable growth of interest in the foundations of arithmetic. This work analyses both the reasons for this growth of interest within both mathematics and philosophy and the ways in which this study of the foundations of arithmetic led to new insights in philosophy and striking advances in logic. This historical-critical study provides an excellent introduction to the problems of the philosophy of mathematics - problems which have wide implications for philosophy as a whole. This reissue will appeal to students of both mathematics and philosophy who wish to improve their knowledge of logic.
Foundations of Mathematics Dover Books on Mathematics
The Number Systems: Foundations of Algebra and AnalysisAmerican Mathematical Soc.
Numbers, Sequences and Series World Scientific Publishing Company
This text is intended for a first course in digital logic design, at the sophomore or junior level, for electrical engineering, computer engineering and computer science programs, as well as for a number of other disciplines such as physics and mathematics. The book can also be used for self-study or for review by practicing engineers and computer scientists not intimately familiar with the subject. After completing this text, the student should be prepared for a second (advanced) course in digital design, switching and automata theory, microprocessors or computer organization. Request Inspection Copy
Number Systems and the Foundations of Analysis Createspace Independent Publishing Platform
The transition from school mathematics to university mathematics is seldom straightforward. Students are faced with a disconnect between the algorithmic and informal attitude to mathematics at school, versus a new emphasis on proof, based on logic, and a more abstract development of general concepts, based on set theory. The authors have many years' experience of the potential difficulties involved, through teaching first-year undergraduates and researching the ways in which students and mathematicians think. The book explains the motivation behind abstract foundational material based on students' experiences of school mathematics, and explicitly suggests ways students can make sense of formal ideas. This second edition takes a significant step forward by not only making the transition from intuitive to formal methods, but also by reversing the process- using structure theorems to prove that formal systems have visual and symbolic interpretations that enhance mathematical thinking. This is exemplified by a new chapter on the theory of groups. While the first edition extended counting to infinite cardinal numbers, the second also extends the real numbers rigorously to larger ordered fields. This links intuitive ideas in calculus to the formal epsilon-delta methods of analysis. The approach here is not the conventional one of 'nonstandard analysis', but a simpler, graphically based treatment which makes the notion of an infinitesimal natural and straightforward. This allows a further vision of the wider world of mathematical thinking in which formal definitions and proof lead to amazing new ways of defining, proving, visualising and symbolising mathematics beyond previous expectations.
The Number Systems Springer
Although students of analysis are familiar with real and complex numbers, few treatments of analysis deal with the development of such numbers in any depth. An understanding of number systems at a fundamental level is necessary for a deeper grasp of analysis. Beginning with elementary concepts from logic and set theory, this book develops in turn the natural numbers, the integers and the rational, real and complex numbers. The development is motivated by the need to solve polynomial equations, and the book concludes by proving that such equations have solutions in the complex number system.
Frege, Dedekind, and Peano on the Foundations of Arithmetic (Routledge Revivals) Cambridge University Press
Foundations of Analysis has two main goals. The first is to develop in students the mathematical maturity and sophistication they will need as they move through the upper division curriculum. The second is to present a rigorous development of both single and several variable calculus, beginning with a study of the properties of the real number system. The presentation is both thorough and concise, with simple, straightforward explanations. The exercises differ widely in level of abstraction

and level of difficulty. They vary from the simple to the quite difficult and from the computational to the theoretical. Each section contains a number of examples designed to illustrate the material in the section and to teach students how to approach the exercises for that section. --Book cover.

Which Numbers Are Real? Cambridge University Press

One of the greatest mathematicians of all time is reported to have said, "Mathematics reveals its secrets only to those who approach it with pure love, for its own beauty." Foundations of Mathematics is devoted to awakening such a love for Mathematics among first year university students. It is a two volume series-Volume 1, Sets and Number Systems, introduces the student to concepts in Abstract Algebra, while Volume 2 focuses on Linear Algebra. Sets and Number Systems deals with basic ideas in logic, sets, relations, functions, binary operations, natural numbers, integers, rational, irrational and real numbers. The emphasis is on developing the student's ability to reason mathematically, and on building a solid foundation from which to pursue further studies in Mathematics/Mathematics-related fields and to enhance problem solving skills. The author offers a wealth of experience in teaching introductory mathematics courses. Students are sure to appreciate her detailed notes and many worked-examples and exercises, as well as, the inspiring stories of mathematicians featured at the end of each chapter. The appendix contains material specially designed for the Sets and Number Systems course at the University of the West Indies, where she teaches.

New Foundations in Mathematics CRC Press

Presents a detailed and critical examination of the available conceptions of set and proposes a novel version.

Foundations of Analysis American Mathematical Soc.

Classic undergraduate text acquaints students with fundamental concepts and methods of mathematics. Topics include axiomatic method, set theory, infinite sets, groups, intuitionism, formal systems, mathematical logic, and much more. 1965 second edition.

Number Systems and the Foundations of Analysis Oxford University Press, USA

In elementary introductions to mathematical analysis, the treatment of the logical and algebraic foundations of the subject is necessarily rather skeletal. This book attempts to flesh out the bones of such treatment by providing an informal but systematic account of the foundations of mathematical analysis written at an elementary level. This book is entirely self-contained but, as indicated above, it will be of most use to university or college students who are taking, or who have taken, an introductory course in analysis. Such a course will not automatically cover all the material dealt with in this book and so particular care has been taken to present the material in a manner which makes it suitable for self-study. In a particular, there are a large number of examples and exercises and, where necessary, hints to the solutions are provided. This style of presentation, of course, will also make the book useful for those studying the subject independently of taught course.

General Systems Theory: Mathematical Foundations Routledge

The fifth volume in the Mathematical Cognition and Learning series focuses on informal learning environments and other parental influences on numerical cognitive development and formal instructional interventions for improving mathematics learning and performance. The chapters cover the use of numerical play and games for improving foundational number knowledge as well as school math performance, the link between early math abilities and the approximate number system, and how families can help improve the early development of math skills. The book goes on to examine learning trajectories in early mathematics, the role of mathematical language in acquiring numeracy skills, evidence-based assessments of early math skills, approaches for intensifying early mathematics interventions, the use of analogies in mathematics instruction, schema-based diagrams for teaching ratios and proportions, the role of cognitive processes in treating mathematical learning difficulties, and addresses issues associated with intervention fadeout. Identifies the relative influence of school and family on math learning Discusses the efficacy of numerical play for improvement in math Features learning trajectories in math Examines the role of math language in numeracy skills Includes assessments of math skills Explores the role of cognition in treating math-based learning difficulties

Conceptions of Set and the Foundations of Mathematics Academic Press

Making up Numbers: A History of Invention in Mathematics offers a detailed but accessible account of a wide range of mathematical ideas. Starting with elementary concepts, it leads the reader towards aspects of current mathematical research. The book explains how conceptual hurdles in the development of numbers and number systems were overcome in the course of history, from Babylon to Classical Greece, from the Middle Ages to the Renaissance, and so to the nineteenth and twentieth centuries. The narrative moves from the Pythagorean insistence on positive multiples to the gradual acceptance of negative numbers, irrationals and complex numbers as essential tools in quantitative analysis. Within this chronological framework, chapters are organised thematically, covering a variety of topics and contexts: writing and solving equations, geometric construction, coordinates and complex numbers, perceptions of ‘infinity’ and its permissible uses in mathematics, number systems, and evolving views of the role of axioms. Through this approach, the author demonstrates that changes in our understanding of numbers have often relied on the breaking of long-held conventions to make way for new inventions at once providing greater clarity and widening mathematical horizons. Viewed from this historical perspective, mathematical abstraction emerges as neither mysterious nor immutable, but as a contingent, developing human activity. Making up Numbers will be of great interest to undergraduate and A-level students of mathematics, as well as secondary school teachers of the subject. In virtue of its detailed treatment of mathematical ideas, it will be of value to anyone seeking to learn more about the development of the subject.

The Number Systems of Analysis Routledge

Number Systems: A Path into Rigorous Mathematics aims to introduce number systems to an undergraduate audience in a way that emphasises the importance of rigour, and with a focus on providing detailed but accessible explanations of theorems and their proofs. The book continually seeks to build upon students' intuitive ideas of how numbers and arithmetic work, and to guide them towards the means to embed this natural understanding into a more structured framework of understanding. The author’s motivation for writing this book is that most previous texts, which have complete coverage of the subject, have not provided the level of explanation needed for first-year students. On the other hand, those that do give good explanations tend to focus broadly on Foundations or Analysis and provide incomplete coverage of Number Systems. Features Approachable for students who have not yet studied mathematics beyond school Does not merely present definitions, theorems and proofs, but also motivates them in terms of intuitive knowledge and discusses methods of proof Draws attention to connections with other areas of mathematics Plenty of exercises for students, both straightforward problems and more in-depth investigations Introduces many concepts that are required in more advanced topics in mathematics.

Foundations of Mathematical Analysis Butterworth-Heinemann

Insights from the history of numerical notation suggest that how humans write numbers is an active choice involving cognitive and social factors. Over the past 5,000 years, more than 100 methods of numerical notation--distinct ways of writing numbers--have been developed and used by specific communities. Most of these are barely known today; where they are known, they are often derided as cognitively cumbersome and outdated. In Reckonings, Stephen Chrisomalis considers how humans past and present use numerals, reinterpreting historical and archaeological representations of numerical notation and exploring the implications of why we write numbers with figures rather than words.