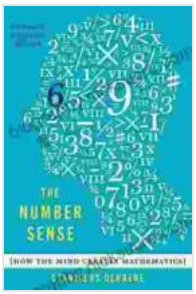
How the Mind Creates Mathematics (Revised and Updated Edition): Unveiling the Cognitive Processes Behind Mathematical Understanding



The Number Sense: How the Mind Creates Mathematics, Revised and Updated Edition

by Stanislas Dehaene

4.6 out of 5

Language	: English
File size	: 3242 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Word Wise	: Enabled
Print length	: 526 pages
Lending	: Enabled

Mathematics, a discipline that has shaped human civilization and driven scientific progress, is not simply a set of abstract rules and formulas. It is a living, breathing entity that exists within the human mind, a product of our cognitive abilities and our innate curiosity about the world around us.

Unveiling the Cognitive Processes

The revised and updated edition of "How the Mind Creates Mathematics" provides a comprehensive exploration of the cognitive processes involved in mathematical cognition. Drawing upon cutting-edge research in

neuroscience, psychology, and education, the book delves into the fundamental building blocks of mathematical understanding.

Number Sense

One of the most essential components of mathematical cognition is number sense, the ability to understand and manipulate numbers. The book explores how the mind represents numbers, how we learn to count, and how we develop an understanding of numerical operations.

Spatial Reasoning

Another crucial aspect of mathematical thinking is spatial reasoning, the ability to mentally manipulate and reason about shapes and spaces. The book examines how the mind processes spatial information, how we develop geometric understanding, and how spatial reasoning influences our mathematical problem-solving abilities.

Logical Thinking

Mathematics is also heavily reliant on logical thinking, the ability to reason logically and draw valid s. The book investigates the role of logic in mathematical cognition, how we develop logical reasoning skills, and how these skills contribute to our ability to solve mathematical problems.

The Nature of Mathematical Knowledge

Beyond the cognitive processes involved in mathematics, the book also explores the nature of mathematical knowledge itself. It examines the different ways in which we represent and communicate mathematical ideas, how mathematical knowledge is structured, and how it is acquired and transmitted.

Mathematical Intuition

One intriguing aspect of mathematical knowledge is the role of mathematical intuition, the ability to solve problems or make discoveries based on a sudden insight or feeling. The book explores the nature of mathematical intuition, its origins, and its relationship to other cognitive processes.

Mathematical Creativity

Another fascinating aspect of mathematics is its creative nature. The book examines the role of creativity in mathematical problem-solving, how mathematicians come up with new ideas, and how mathematical creativity contributes to the advancement of the field.

Mathematical Abilities and Education

The book also explores the implications of cognitive research in mathematics for education. It provides insights into how children develop mathematical abilities, how these abilities can be fostered, and how effective mathematics instruction can be designed.

Developing Mathematical Understanding

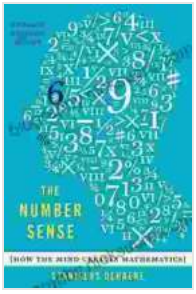
The book emphasizes the importance of developing a deep understanding of mathematics, moving beyond rote memorization and focusing on conceptual understanding. It provides research-based strategies for teaching mathematics effectively, promoting meaningful learning experiences, and fostering mathematical thinking.

Promoting Mathematical Equity

Recognizing the importance of equity in mathematics education, the book addresses issues related to mathematical anxiety, gender differences in mathematics performance, and the role of culture in shaping mathematical abilities. It provides guidance on creating inclusive learning environments that support the mathematical success of all students.

The revised and updated edition of "How the Mind Creates Mathematics" is an essential resource for anyone interested in understanding the cognitive processes involved in mathematics and the nature of mathematical knowledge. It provides a comprehensive exploration of the mind's mathematical machinery, shedding light on the intricate interplay between our cognitive abilities and the world of numbers, shapes, and logical reasoning.

Whether you are a mathematician, a cognitive scientist, an educator, or simply someone curious about the human mind, this book will challenge your assumptions, broaden your horizons, and deepen your appreciation for the enigmatic and captivating world of mathematics.



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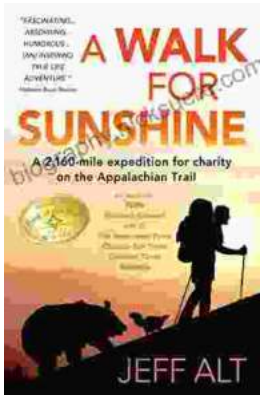

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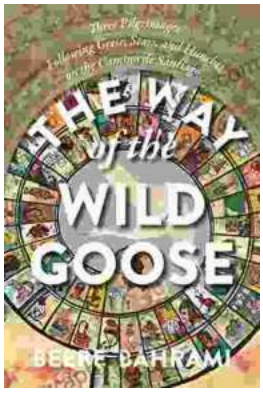

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