

Mathematical Ideas 12 Edition

Books a la Carte are unbound, three-hole-punch versions of the textbook. This lower cost option is easy to transport and comes with same access code or media that would be packaged with the bound book. Mathematical Ideas captures the interest of non-majors who take the Liberal Arts Math course by showing how mathematics plays an important role in scenes from popular movies and television. By incorporating John Hornsby's "Math Goes to Hollywood" approach into chapter openers, margin notes, examples, exercises, and resources, this text makes it easy to weave this engaging theme into your course. The Twelfth Edition continues to deliver the superlative writing style, carefully developed examples, and extensive exercise sets that instructors have come to expect. This Package Contains: MATHEMATICAL IDEAS, 12/e (a la Carte edition) with MyMathLab/MyStatLab Student Access Kit

A discussion of fundamental mathematical principles from algebra to elementary calculus designed to promote constructive mathematical reasoning. The tenth edition of Mathematical Ideas is the best ever! We have continued with the features and pedagogy that has made this book so successful over the years and at the same time, we've spent a considerable amount of time to incorporate fresh data, new photos, and new content (by way of a new chapter on trigonometry). We have tried to reflect the needs of our users – both long-time readers and those new to the Math Ideas way of teaching liberal arts math. We hope you'll be pleased with the results. – Chapter Openers Each chapter opens with an application related to the chapter topic. These help students see the relevance of mathematics they are about to learn. – Varied Exercise Sets We continue to present a variety of exercises Including drill, conceptual, and applied problems. We continue to use graphs, tables, and charts when appropriate. Most sections include a few challenging exercises that require students to extend the ideas presented in the section. To address the issue of writing across the curriculum, most exercise sets include some exercises that require the student to answer by writing a few sentences. – For Further Thought These entries encourage students to discuss a From the editors of the popular Making Mathematics with Needlework, this book presents projects that highlight the relationship between types of needlework and mathematics. Chapters start with accessible overviews presenting the interplay between mathematical concepts and craft expressions. Following sections explain the mathematics in more detail, and provide suggestions for classroom activities. Each chapter ends with specific crafting instructions. Types of needlework included are knitting, crochet, needlepoint, cross-stitch, quilting, temari balls, beading, tatting, and string art. Instructions are written as ordinary patterns, so the formatting and language will be familiar to crafters.

Mathematics of Public Key Cryptography

Fiber Arts and Mathematics

Ethnomathematics

Mathematical Mindsets

The Mathematical Ideas That Animate Great Magic Tricks

The Math Book

In COLLEGE MATHEMATICS FOR THE MANAGERIAL, LIFE, AND SOCIAL SCIENCES, Soo T. Tan provides an accessible yet accurate presentation of mathematics combined with just the right balance of applications, pedagogy, and technology to help students succeed in the course. The new Sixth Edition includes highly interesting current applications and exercises to help stimulate student motivation. An exciting new array of supplements provides students with extensive learning support so instructors will have more time to focus on teaching core concepts.

"Magical Mathematics reveals the secrets of amazing, fun-to-perform card tricks--and the profound mathematical ideas behind them--that will astound even the most accomplished magician. Persi Diaconis and Ron Graham provide easy, step-by-step instructions for each trick, explaining how to set up the effect and offering tips on what to say and do while performing it. Each card trick introduces a new mathematical idea, and varying the tricks in turn takes readers to the very threshold of today's mathematical knowledge. For example, the Gilbreath principle--a fantastic effect where the cards remain in control despite being shuffled--is found to share an intimate connection with the Mandelbrot set. Other card tricks link to the mathematical secrets of combinatorics, graph theory, number theory, topology, the Riemann hypothesis, and even Fermat's last theorem. Diaconis and Graham are mathematicians as well as skilled performers with decades of professional experience between them. In this book they share a wealth of conjuring lore, including some closely guarded secrets of legendary magicians. Magical Mathematics covers the mathematics of juggling and shows how the I Ching connects to the history of probability and magic tricks both old and new. It tells the stories--and reveals the best tricks--of the eccentric and brilliant inventors of mathematical magic. Magical Mathematics exposes old gambling secrets through the mathematics of shuffling cards, explains the classic street-gambling scam of three-card monte, traces the history of mathematical magic back to the thirteenth century and the oldest mathematical trick--and much more"--The main intention of this book is to describe and develop the conceptual, structural and abstract thinking of mathematics. Specific mathematical structures are used to illustrate the conceptual approach; providing a deeper insight into mutual relationships and abstract common features. These ideas are carefully motivated, explained and illustrated by examples so that many of the more technical proofs can be omitted. The book can therefore be used: · simply as an overview of the panorama of mathematical structures and the relations between them, to be supplemented by more detailed texts whenever you want to acquire a working knowledge of some structure · by itself as a first introduction to abstract mathematics · together with existing textbooks, to put their results into a more general perspective · to gain a new and hopefully deeper perspective after having studied such textbooks Mathematical Concepts has a broader scope and is less detailed than standard mathematical textbooks so that the reader can readily grasp the essential concepts and ideas for individual needs. It will be suitable for advanced mathematicians, postgraduate students and for scientists from other fields with some background in formal reasoning. This manual provides solutions to odd-numbered exercises in the exercise sets and Extensions, all Appendix exercises, as well as solutions for all the Chapter Test exercises.

Mathematics With Applications

What Works Best to Optimize Student Learning

Mathematical Ideas + Mathxl 12 Month Access

Teaching Social Justice by the Numbers

Mathematical Ideas Expanded Edition + Mathxl 12-month Student Access Kit + Video Lectures on Cd With Optional Captioning for Mathematical Ideas

Informed Decisions Using Data

Now in its fourth edition, the bestselling text Mathematical Knowledge for Primary Teachers provides trainee teachers with clear information about the fundamental mathematical ideas taught in primary schools. With rigorous and comprehensive coverage of all the mathematical knowledge primary teachers need, the text goes beyond rules and routines to help readers deepen their understanding of mathematical ideas and increase their confidence in teaching these ideas. Fully updated to incorporate recommendations of the Williams review, new sections are included covering talk for learning in mathematics, with an emphasis placed on the language and vocabulary used in arithmetic contexts. Throughout the book, knowledge is linked to the TDA standards for Qualified Teacher Status, and features include: [Check] questions to test the reader's understanding [Challenges], to increase teachers' confidence and stretch their mathematical abilities [Links with the classroom] to emphasise the relevance of ideas to the classroom context Straightforward coverage from theory to practice for all aspects of the Mathematics framework. The book is accompanied by e-resources, which contain further visual activities and support, designed to scaffold and support the reader's own understanding. Essential reading for all practising and trainee primary teachers, this book is ideal for those who wish to increase their mathematical understanding and confidence in presenting mathematics in the classroom.

In the last 60 years, the use of the notion of category has led to a remarkable unification and simplification of mathematics. Conceptual Mathematics introduces this tool for the learning, development, and use of mathematics, to beginning students and also to practising mathematical scientists. This book provides a skeleton key that makes explicit some concepts and procedures that are common to all branches of pure and applied mathematics. The treatment does not presuppose knowledge of specific fields, but rather develops, from basic definitions, such elementary categories as discrete dynamical systems and directed graphs; the fundamental ideas are then illuminated by examples in these categories. This second edition provides links with more advanced topics of possible study. In the new appendices and annotated bibliography the reader will find concise introductions to adjoint functors and geometrical structures, as well as sketches of relevant historical developments.

In this charming volume, a noted English mathematician uses humor and anecdote to illuminate the concepts of groups, sets, subsets, topology, Boolean algebra, and other mathematical subjects. 200 illustrations.

We have tried to reflect the needs of our users--both long-time readers and those new to the Math Ideas way of teaching liberal arts math. We hope you'll be pleased with the results. Like its predecessors, this edition has been designed with a variety of students in mind. It is well-suited for several courses, including the aforementioned liberal arts audience, survey courses in mathematics, and mathematics for prospective and in-service elementary and middle school teachers. Ample topics are included for a two-term course, yet the variety of topics and flexibility of sequence make the text suitable for shorter courses as well. Our main objectives continue to be to provide comprehensive coverage of topics, appropriate organization, clear exposition, an abundance of examples, and well-planned exercise sets with numerous applications. ... From publisher description.

Connecting Mathematical Ideas

An Elementary Study

Middle School Video Cases to Support Teaching and Learning

The Growth of Mathematical Ideas, Grades K-12

Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching

Pascal's Arithmetical Triangle

Accessible to students and relevant to specialists, this remarkable book by a prominent educator offers a unique perspective on the evolutionary development of mathematics. Rather than conducting a survey of the history or philosophy of mathematics, Raymond L. Wilder envisions mathematics as a broad cultural phenomenon. His treatment examines and illustrates how such concepts as number and length were affected by historic and social events. Starting with a brief consideration of preliminary notions, this study explores the early evolution of numbers, the evolution of geometry, and the conquest of the infinite as embodied by real numbers. A detailed look at the processes of evolution concludes with an examination of the evolutionary aspects of modern mathematics.

This book is for anyone who wishes to illustrate their mathematical ideas, which in our experience means everyone. It is organized by material, rather than by subject area, and purposefully emphasizes the process of creating things, including discussions of failures that occurred along the way. As a result, the reader can learn from the experiences of those who came before, and will be inspired to create their own illustrations. Topics illustrated within include prime numbers, fractals, the Klein bottle, Borromean rings, tilings, space-filling curves, knot theory, billiards, complex dynamics, algebraic surfaces, groups and prime ideals, the Riemann zeta function, quadratic fields, hyperbolic space, and hyperbolic 3-manifolds. Everyone who opens this book should find a type of mathematics with which they identify. Each contributor explains the mathematics behind their illustration at an accessible level, so that all readers can appreciate the beauty of both the object itself and the mathematics behind it.

Too often math gets a bad rap, characterized as dry and difficult. But, Alex Bellos says, "math can be inspiring and brilliantly creative. Mathematical thought is one of the great achievements of the human race, and arguably the foundation of all human progress. The world of mathematics is a remarkable place." Bellos has traveled all around the globe and has plunged into history to uncover fascinating stories of mathematical achievement, from the breakthroughs of Euclid, the greatest mathematician of all time, to the creations of the Zen master of origami, one of the hottest areas of mathematical work today. Taking us into the wilds of the Amazon, he tells the story of a tribe there who can count only to five and reports on the latest findings about the math instinct—including the revelation that ants can actually count how many steps they 've taken. Journeying to the Bay of Bengal, he interviews a Hindu sage about the brilliant mathematical insights of the Buddha, while in Japan he visits the godfather of Sudoku and introduces the breathtaking delights of mathematical games. Exploring the mysteries of randomness, he explains why it is impossible for our iPods to truly randomly select songs. In probing the many intrigues of that most beloved of numbers, pi, he visits with two brothers so obsessed with the elusive number that they built a supercomputer in their Manhattan apartment to study it. Throughout, the journey is enhanced with a wealth of intriguing illustrations, such as of the clever puzzles known as tangrams and the crochet creation of an American math professor who suddenly realized one day that she could knit a representation of higher dimensional space that no one had been able to visualize. Whether writing about how algebra solved Swedish traffic problems, visiting the Mental Calculation World Cup to disclose the secrets of lightning calculation, or exploring the links between pineapples and beautiful teeth, Bellos is a wonderfully engaging guide who never fails to delight even as he edifies. Here 's Looking at Euclid is a rare gem that brings the beauty of math to life.

In math, like any subject, real learning takes place when students can connect what they already know to new ideas. In "Connecting Mathematical Ideas", Jo Boaler and Cathy Humphreys offer a comprehensive way to improve your ability to help adolescents build connections between different mathematical ideas and representations and between domains like algebra and geometry. "Connecting Mathematical Ideas" contains two-CDs worth of video case studies from Humphreys' own middle-school classroom that show her encouraging students to bridge complex mathematical concepts with their prior knowledge. Replete with math talk and coverage of topics like representation, reasonableness, and proof, the CDs also include complete transcripts and study questions that stimulate professional learning. Meanwhile, the accompanying book guides you through the CDs with in-depth commentary from Boaler and Humphreys that breaks down and analyzes the lesson footage from both a theoretical and a practical standpoint. In addition to addressing the key content areas of middle school mathematics, Boaler and Humphreys pose and help you address a broad range of frequently asked pedagogical questions, such as: How can I organize productive class discussions? How do I ask questions that stimulate discussion and thought among my students? What's the most effective way to encourage reticent class members to speak up? What role should student errors play in my teaching? Go inside real classrooms to solve your toughest teaching questions. Use the case studies and the wealth of professional support within "Connecting Mathematical Ideas" and find new ways to help your students connect with math.

Evolution of Mathematical Concepts

Magical Mathematics

What is Mathematics?

Conceptual Mathematics

College Mathematics for the Managerial, Life, and Social Sciences

Mathematical Concepts in Organic Chemistry

This survey explores the history of the arithmetical triangle, from its roots in Pythagorean arithmetic, Hindu combinatorics, and Arabic algebra to its influence on Newton and Leibniz as well as modern-day mathematicians.

0321799593 / 9780321799593 Mathematical Ideas with Student Solutions Manual and MathXL Package consists of: 0201716305 / 9780201716306 MathXL -- Valuepack Access Card (12-month access) 0321693817 / 9780321693815 Mathematical Ideas 0321693841 / 9780321693846 Student Solutions Manual for Mathematical Ideas

Mathematical IdeasAddison Wesley

MATHEMATICAL APPLICATIONS FOR THE MANAGEMENT, LIFE, AND SOCIAL SCIENCES, 10th Edition, is intended for a two-semester applied calculus or combined finite mathematics and applied calculus course. The book's concept-based approach, multiple presentation methods, and interesting and relevant applications keep students who typically take the course--business, economics, life sciences, and social sciences majors--engaged in the material. This edition broadens the book's real-life context by adding a number of environmental science and economic applications. The use of modeling has been expanded, with modeling problems now clearly labeled in the examples. Also included in the Tenth Edition is a brief review of algebra to prepare students with different backgrounds for the material in later chapters. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Statistics

Mathematical Ideas

A First Introduction to Categories

The Growth of Mathematical Ideas

Brain, Mind, Experience, and School: Expanded Edition

Grades K-12

ALERT: Before you purchase, check with your instructor or review your course syllabus to ensure that you select the correct ISBN. Several versions of Pearson's MyLab & Mastering products exist for each title, including customized versions for individual schools, and registrations are not transferable. In addition, you may need a CourseID, provided by your instructor, to register for and use Pearson's MyLab & Mastering products. Packages Access codes for Pearson's MyLab & Mastering products may not be included when purchasing or renting from companies other than Pearson; check with the seller before completing your purchase. Used or rental books If you rent or purchase a used book with an access code, the access code may have been redeemed previously and you may have to purchase a new access code. Access codes Access codes that are purchased from sellers other than Pearson carry a higher risk of being either the wrong ISBN or a previously redeemed code. Check with the seller prior to purchase. -- Michael Sullivan's Statistics: Informed Decisions Using Data, Fourth Edition, connects statistical concepts to students' lives, helping them to think critically, become informed consumers, and make better decisions. Throughout the book, "Putting It Together" features help students visualize the relationships among various statistical concepts. This feature extends to the exercises, providing a consistent vision of the bigger picture of statistics. This book follows the Guidelines for Assessment and Instruction in Statistics Education (GAISE), as recommended by the American Statistical Association, and emphasizes statistical literacy, use of real data and technology, conceptual understanding, and active learning.

First released in the Spring of 1999, How People Learn has been expanded to show how the theories and insights from the original book can translate into actions and practice, now making a real connection between classroom activities and learning behavior. This edition includes far-reaching suggestions for research that could increase the impact that classroom teaching has on actual learning. Like the original edition, this book offers exciting new research about the mind and the brain that provides answers to a number of compelling questions. When do infants begin to learn? How do experts learn and how is this different from non-experts? What can teachers and schools do-with curricula, classroom settings, and teaching methods--to help children learn most effectively? New evidence from many branches of science has significantly added to our understanding of what it means to know, from the neural processes that occur during learning to the influence of culture on what people see and absorb. How People Learn examines these findings and their implications for what we teach, how we teach it, and how we assess what our children learn. The book uses exemplary teaching to illustrate how approaches based on what we now know result in in-depth learning. This new knowledge calls into question concepts and practices firmly entrenched in our current education system. Topics include: How learning actually changes the physical structure of the brain. How existing knowledge affects what people notice and how they learn. What the thought processes of experts tell us about how to teach. The amazing learning potential of infants. The relationship of classroom learning and everyday settings of community and workplace. Learning needs and opportunities for teachers. A realistic look at the role of technology in education.

For one- or two-semester courses in Calculus for students majoring in business, social sciences, and life sciences. Intuition before Formality Calculus & Its Applications builds intuition with key concepts of calculus before the analytical material. For example, the authors explain the derivative geometrically before they present limits, and they introduce the definite integral intuitively via the notion of net change before they discuss Riemann sums. The strategic organization of topics makes it easy to adjust the level of theoretical material covered. The significant applications introduced early in the course serve to motivate students and make the mathematics more accessible. Another unique aspect of the text is its intuitive use of differential equations to model a variety of phenomena in Chapter

5, which addresses applications of exponential and logarithmic functions. Time-tested, comprehensive exercise sets are flexible enough to align with each instructor's needs, and new exercises and resources in MyLab® Math help develop not only skills, but also conceptual understanding, visualization, and applications. The 14th Edition features updated exercises, applications, and technology coverage, presenting calculus in an intuitive yet intellectually satisfying way. Also available with MyLab Math MyLab® Math is an online homework, tutorial, and assessment program designed to work with this text to engage students and improve results. Within its structured environment, students practice what they learn, test their understanding, and pursue a personalized study plan that helps them absorb course material and understand difficult concepts. In the new edition, MyLab Math has expanded to include a suite of new videos, Interactive Figures, exercises that require step-by-step solutions, conceptual questions, calculator support, and more. Note: You are purchasing a standalone product; MyLab does not come packaged with this content. Students, if interested in purchasing this title with MyLab, ask your instructor for the correct package ISBN and Course ID. Instructors, contact your Pearson representative for more information. If you would like to purchase both the physical text and MyLab, search for: 013476868X / 9780134768687 Calculus & Its Applications plus MyLab Math with Pearson eText -- Title-Specific Access Card Package, 14/e Package consists of: 0134437772 / 9780134437774 Calculus & Its Applications 0134765699 / 9780134765693 MyLab Math with Pearson eText -- Standalone Access Card -- for Calculus & Its Applications

A collection of more than thirty articles shows teachers how to weave social justice principles throughout the math curriculum, and how to integrate social justice math into other curricular areas as well.

Mathematical Concepts and Methods in Modern Biology

Mathematical Ideas [With Student's Solutions Manual and Access Code]

Mathematical Concepts

Rethinking Mathematics

Visible Learning for Mathematics, Grades K-12

Concepts of Modern Mathematics

This advanced graduate textbook gives an authoritative and insightful description of the major ideas and techniques of public key cryptography.

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts, introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

MATHEMATICAL APPLICATIONS FOR THE MANAGEMENT, LIFE, AND SOCIAL SCIENCES, 12th Edition, engages students with its concept-based approach, multiple presentation methods and relevant applications throughout. Intended for two-semester applied calculus or combined finite mathematics and applied calculus courses, the book places concepts in real-life context to help students strengthen their understanding. A focus on modeling--with modeling problems clearly labeled in the examples and problems, so they can be treated as optional--and flexible content organization accommodate different teaching approaches, enabling instructors to decide the order in which topics may be presented and the degree to which they may be emphasized. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

See how math's infinite mysteries and beauty unfold in this captivating educational book! Discover more than 85 of the most important mathematical ideas, theorems, and proofs ever devised with this beautifully illustrated book. Get to know the great minds whose revolutionary discoveries changed our world today. You don't have to be a math genius to follow along with this book! This brilliant book is packed with short, easy-to-grasp explanations, step-by-step diagrams, and witty illustrations that play with our ideas about numbers. What is an imaginary number? Can two parallel lines ever meet? How can math help us predict the future? All will be revealed and explained in this encyclopedia of mathematics. It's as easy as 1-2-3! The Math Book tells the exciting story of how mathematical thought advanced through history. This diverse and inclusive account will have something for everybody, including the math behind world economies and espionage. This book charts the development of math around the world, from ancient mathematical ideas and inventions like prehistoric tally bones through developments in medieval and Renaissance Europe. Fast forward to today and gain insight into the recent rise of game and group theory. Delve in deeper into the history of math: - Ancient and Classical Periods 6000 BCE - 500 CE - The Middle Ages 500 - 1500 - The Renaissance 1500 - 1680 - The Enlightenment 1680 - 1800 - The 19th Century 1800 - 1900 - Modern Mathematics 1900 - Present The Series Simply Explained With over 7 million copies sold worldwide to date, The Math Book is part of the award-winning Big Ideas Simply Explained series from DK Books. It uses innovative graphics along with engaging writing to make complex subjects easier to understand.

Mathematics for Neuroscientists

Illustrating Mathematics

The Story of a Mathematical Idea

Mathematics for Machine Learning

Crafting by Concepts

Mathematical Knowledge for Primary Teachers

Banish math anxiety and give students of all ages a clear roadmap to success Mathematical Mindsets provides practical strategies and activities to help teachers and parents show all children, even those who are convinced that they are bad at math, that they can enjoy and succeed in math. Jo Boaler—Stanford researcher, professor of math education, and expert on math learning—has studied why students don't like math and often fail in math classes. She's followed thousands of students through middle and high schools to study how they learn and to find the most effective ways to unleash the math potential in all students. There is a clear gap between what research has shown to work in teaching math and what happens in schools and at home. This book bridges that gap by turning research findings into practical activities and advice. Boaler translates Carol Dweck's concept of 'mindset' into math teaching and parenting strategies, showing how students can go from self-doubt to strong self-confidence, which is so important to math learning. Boaler reveals the steps that must be taken by schools and parents to improve math education for all. Mathematical Mindsets: Explains how the brain processes mathematics learning Reveals how to turn mistakes and struggles into valuable learning experiences Provides examples of rich mathematical activities to replace rote learning Explains ways to give students a positive math mindset Gives examples of how assessment and grading policies need to change to support real understanding Scores of students hate and fear math, so they end up leaving school without an understanding of basic mathematical concepts. Their evasion and departure hinders math-related pathways and STEM career opportunities. Research has shown very clear methods to change this phenomena, but the information has been confined to research journals—until now. Mathematical Mindsets provides a proven, practical roadmap to mathematics success for any student at any age.

"An introduction to some of the mathematical ideas which are useful to biologists, ... the ways in which biological problems can be expressed mathematically, and how the mathematical equations which arise in biological work can be solved ... This book is particularly concerned with non-statistical topics"--From publisher description.

This package contains the following components: -0321361482: Mathematical Ideas -0201716305: MathXL (12-month access)

Mathematics for Neuroscientists, Second Edition, presents a comprehensive introduction to mathematical and computational methods used in neuroscience to describe and model neural components of the brain from ion channels to single neurons, neural networks and their relation to behavior. The book contains more than 200 figures generated using Matlab code available to the student and scholar. Mathematical concepts are introduced hand in hand with neuroscience, emphasizing the connection between experimental results and theory. Fully revised material and corrected text Additional chapters on extracellular potentials, motion detection and neurovascular coupling Revised selection of exercises with solutions More than 200 Matlab scripts reproducing the figures as well as a selection of equivalent Python scripts

Calculus & Its Applications

Here's Looking at Euclid

How People Learn

A Surprising Excursion Through the Astonishing World of Math

An Elementary Approach to Ideas and Methods

Mathematics for Physical Chemistry, Third Edition, is the ideal text for students and physical chemists who want to sharpen their mathematics skills. It can help prepare the reader for an undergraduate course, serve as a supplementary text for use during a course, or serve as a reference for graduate students and practicing chemists. The text concentrates on applications instead of theory, and, although the emphasis is on physical chemistry, it can also be useful in general chemistry courses. The Third Edition includes new exercises in each chapter that provide practice in a technique immediately after discussion or example and encourage self-study. The first ten chapters are constructed around a sequence of mathematical topics, with a gradual progression into more advanced material. The final chapter discusses mathematical topics needed in the analysis of experimental data. Numerous examples and problems interspersed throughout the presentations Each extensive chapter contains a preview, objectives, and summary Includes topics not found in similar books, such as a review of general algebra and an introduction to group theory Provides chemistry specific instruction without the distraction of abstract concepts or theoretical issues in pure mathematics

The present book is an attempt to outline some, certainly not all, mathematical aspects of modern organic chemistry. We have focused our attention on topological, graph-theoretical and group-theoretical features of organic chemistry, Parts A, B and C. The book is directed to all those chemists who use, or who intend to use mathe matics in their work, and especially to graduate students. The level of our exposition is adjusted to the mathematical background of graduate students of chemistry and only some knowledge of elementary algebra and calculus is required from the readers of the book. Some less well-known. but still elementary mathematical facts are collected in Appendices 1-4. This, however, does not mean that the mathematical rigor and numerous tedious, but necessary technical details have been avoided. The authors' intention was to show the reader not only how the results of mathematical chemistry look, but also how they can be obtained. In accordance with this, Part 0 of the book contains a few selected advanced topics which should give the reader the flavour of the contemporary research in mathe matical organic chemistry. One of the authors (I.G.) was an Alexander von Humboldt fellow in 1985 when the main part of the book was written. He gratefully acknowledges the financial support of the Alexander von Humboldt Foundation which enabled his stay at the Max-Planck-Institut für Strahlenchemie in M iilheim and the writing of this book.

Mathematical Concepts and Methods in Modern Biology offers a quantitative framework for analyzing, predicting, and modulating the behavior of complex biological systems. The book presents important mathematical concepts, methods and tools in the context of essential questions raised in modern biology. Designed around the principles of project-based learning and problem-solving, the book considers biological topics such as neuronal networks, plant population growth, metabolic pathways, and phylogenetic tree reconstruction. The mathematical modeling tools brought to bear on these topics include Boolean and ordinary differential equations, projection matrices, agent-based modeling and several algebraic approaches. Heavy computation in some of the examples is eased by the use of freely available open-source software. Features self-contained chapters with real biological research examples using freely available computational tools Spans several mathematical techniques at basic to advanced levels Offers broad perspective on the uses of algebraic geometry/polynomial algebra in molecular systems biology

Rich tasks, collaborative work, number talks, problem-based learning, direct instruction...with so many possible approaches, how do we know which ones work the best? In Visible Learning for Mathematics, six acclaimed educators assert it's not about which one—it's about when—and show you how to design high-impact instruction so all students demonstrate more than a year's worth of mathematics learning for a year spent in school. That's a high bar, but with the amazing K-12 framework here, you choose the right approach at the right time, depending upon where learners are within three phases of learning: surface, deep, and transfer. This results in "visible" learning because the effect is tangible. The framework is forged out of current research in mathematics combined with John Hattie's synthesis of more than 15 years of education research involving 300 million students. Chapter by chapter, and equipped with video clips, planning tools, rubrics, and templates, you get the inside track on which instructional strategies to use at each phase of the learning cycle: Surface learning phase: When—through carefully constructed experiences—students explore new concepts and make connections to procedural skills and vocabulary that give shape to developing conceptual understandings. Deep learning phase: When—through the solving of rich high-cognitive tasks and rigorous discussion—students make connections among conceptual ideas, form mathematical generalizations, and apply and practice procedural skills with fluency. Transfer phase: When students can independently think through more complex mathematics, and can plan, investigate, and elaborate as they apply what they know to new mathematical situations. To equip students for higher-level mathematics learning, we have to be clear about where students are, where they need to go, and what it looks like when they get there. Visible Learning for Math brings about powerful, precision teaching for K-12 through intentionally designed guided, collaborative, and independent learning.

Mathematical Ideas in Biology

Mathematics for Physical Chemistry

Student Solutions Manual for Mathematical Ideas

Using Modern Discrete Models

Mathematical Applications for the Management, Life, and Social Sciences

A Multicultural View of Mathematical Ideas

In this truly one-of-a-kind book, Ascher introduces the mathematical ideas of people in traditional, or "small-scale", cultures often omitted from discussion of mathematics. Topics such as "Numbers: Words and Symbols", "Tracing Graphs in the Sand", "The Logic of Kin Relations", "Chance and Strategy in Games and Puzzles", and "The Organization and Modeling of Space" are traced in various cultures including the Inuit, Navajo, and Iroquois of North America; the Inca of South America; the Malekula, Warlpiri, Maori, and Caroline Islanders of Oceania, and the Tshokwe, Bushoong, and Kpelle of Africa. As Ascher explores mathematical ideas involving numbers, logic, spatial configuration, and the organization of these into systems and structures, readers gain both a broader understanding and an appreciation for the idease of other peoples.