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Tropical geometry is a combinatorial shadow of algebraic geometry, offering new polyhedral tools to compute invariants of algebraic varieties. It is based on tropical algebra, where the sum of two numbers is their minimum and the product is their sum. This turns polynomials into piecewise-linear functions, and their zero sets into polyhedral complexes. These tropical varieties retain a surprising amount of information about their classical counterparts. Tropical geometry is a young subject that has undergone a rapid development since the beginning of the 21st century. While establishing itself as an area in its own right, deep connections have been made to many branches of pure and applied mathematics. This book offers a self-contained introduction to tropical geometry, suitable as a course text for beginning graduate students. Proofs are provided for the main results, such as the Fundamental Theorem and the Structure Theorem. Numerous examples and explicit computations illustrate the main concepts. Each of the six chapters concludes with problems that will help the readers to practice their tropical skills, and to gain access to the research literature. This wonderful book will appeal to students and researchers of all stripes: it begins at an undergraduate level and ends with deep connections to toric varieties, compactifications, and degenerations. In between, the authors provide the first complete proofs in book form of many fundamental results in the subject. The pages are sprinkled with illuminating examples, applications, and exercises, and the writing is lucid and meticulous throughout. It is that rare kind of book which will be used equally as an introductory text by students and as a reference for experts. —Matt Baker, Georgia Institute of Technology Tropical geometry is an exciting new field, which requires tools from various parts of mathematics and has connections with many areas. A short definition is given by Maclagan and Sturmfels: “Tropical geometry is a marriage between algebraic and polyhedral geometry”. This wonderful book is a pleasant and rewarding journey through different landscapes, inviting the readers from a day at a beach to the hills of modern algebraic geometry. The authors present building blocks, examples and exercises as well as recent results in tropical geometry, with ingredients from algebra, combinatorics, symbolic computation, polyhedral geometry and algebraic geometry. The volume will appeal both to beginning graduate students willing to enter the field and to researchers, including experts. —Alicia Dickenstein, University of Buenos Aires, Argentina Take the brakes off your business. In the perfect follow-up to 1001 Ways to Reward Employees, the innovative book that has sold over one million copies, Bob Nelson reveals what real companies across America are doing to get the very best out of their employees—and why it's the key to their success. Energizing is listening—AT&T's Universal Card Service's employee suggestion system yields 1,200 ideas a month and millions of dollars in savings. Energizing is encouraging risk-taking—Hershey Foods gives out The Exalted Order of the Extended Neck Award. Energizing is Starbuck's making employees partners, Saturn creating teams that function as independent small businesses, Springfield Remanufacturing's opening its books to all employees. With case studies, examples, techniques, research highlights, and quotes from business leaders, 1001 Ways to Energize Employees is invaluable for managers seeking to increase employee enthusiasm and involvement. Students learn about important subjects by relating them to events and things that occur in their everyday lives. A wealth of interesting activities provide a detailed look into each subject. Easy-to-use activities can be completed individually at school or at home, though a few hands-on experiments require group work and data sharing. A great supplement to any existing curriculum! When students see the important role math plays in their everyday lives, it becomes more interesting and meaningful. A variety of activities enable all students to find a particular math concept or activity at which they can succeed! Bridging a number of mathematical disciplines, and exposing many facets of systems of polynomial equations, Bernd Sturmfels's study covers a wide spectrum of mathematical techniques and algorithms, both symbolic and numerical. With a specific focus on the mathematical life in small undergraduate colleges, this book presents a variety of elementary number theory insights involving sequences largely built from prime numbers and contingent number-theoretic functions. Chapters include new mathematical ideas and open problems, some of which are proved in the text. Vector valued MGPF sequences, extensions of Conway's Subprime Fibonacci sequences, and linear complexity of bit streams derived from GPF sequences are among the topics covered in this book. This book is perfect for the pure-mathematics-minded educator in a small undergraduate college as well as graduate students and advanced undergraduate students looking for a significant high-impact learning experience in mathematics. Although its roots can be traced to the 19th century, progress in the study of nonlinear dynamical systems has taken off in the last 30 years. While pertinent source material exists, it is strewn about the literature in mathematics, physics, biology, economics, and psychology at varying levels of accessibility. A compendium research methods reflect Can you really keep your eye on the ball? How is massive data collection changing sports? Sports science courses are growing in popularity. The author's course at Roanoke College is a mix of physics, physiology, mathematics, and statistics. Many students of both genders find it exciting to think about sports. Sports problems are easy to create and state, even for students who do not live sports 24/7. Sports are part of their culture and knowledge base, and the opportunity to be an expert on some area of sports is invigorating. This should be the primary reason for the growth of mathematics of sports courses: the topic provides intrinsic motivation for students to do their best work. From the Author: "The topics covered in Sports Science and Sports Analytics courses vary widely. To use a golfing analogy, writing a book like this is like hitting a drive at a driving range; there are many directions you can go without going out of bounds. At the driving range, I pick out a small target to focus on, and that is what I have done here. I have chosen a sample of topics I find very interesting. Ideally, users of this book will have enough to choose from to suit whichever version of a sports course is being run." "The book is very appealing to teach from as well as to learn from. Students seem to have a growing interest in ways to apply traditionally different areas to solve problems. This, coupled with an enthusiasm for sports, makes Dr. Minton's book appealing to me."—Kevin Hutson, Furman University This text is designed for those who wish to study mathematics beyond linear algebra but are unready for abstract material. Rather than a theorem-proof-corollary exposition, it stresses geometry, intuition, and dynamical systems. 1996 edition. The risk of counterparty default in banking, insurance, institutional, and pension-fund portfolios is an area of ongoing and increasing importance for finance practitioners. It is, unfortunately, a topic with a high degree of technical complexity. Addressing this challenge, this book provides a comprehensive and attainable mathematical and statistical discussion of a broad range of existing default-risk models. Model description and derivation, however, is only part of the story. Through use of exhaustive practical examples and extensive code illustrations in the Python programming language, this work also explicitly shows the reader how these models are implemented. Bringing these complex approaches to life by combining the technical details with actual real-life Python code reduces the burden of model complexity and enhances accessibility to this decidedly specialized field of study. The entire work is also liberally supplemented with model-diagnostic, calibration, and parameter-estimation techniques to assist the quantitative analyst in day-to-day implementation as well as in mitigating model risk. Written by an active and experienced practitioner, it is an invaluable learning resource and reference text for financial-risk practitioners and an excellent source for advanced undergraduate and graduate students seeking to acquire knowledge of the key elements of this discipline. Besides

their well-known value in number theory, continued fractions are also a useful tool in modern numerical applications and computer science. The goal of the book is to revisit the almost forgotten classical theory and to contextualize it for contemporary numerical applications and signal processing, thus enabling students and scientist to apply classical mathematics on recent problems. The books tries to be mostly self-contained and to make the material accessible for all interested readers. This provides a new view from an applied perspective, combining the classical recursive techniques of continued fractions with orthogonal problems, moment problems, Prony's problem of sparse recovery and the design of stable rational filters, which are all connected by continued fractions. What are your chances of dying on your next flight, being called for jury duty, or winning the lottery? We all encounter probability problems in our everyday lives. In this collection of twenty-one puzzles, Paul Nahin challenges us to think creatively about the laws of probability as they apply in playful, sometimes deceptive, ways to a fascinating array of speculative situations. Games of Russian roulette, problems involving the accumulation of insects on flypaper, and strategies for determining the odds of the underdog winning the World Series all reveal intriguing dimensions to the workings of probability. Over the years, Nahin, a veteran writer and teacher of the subject, has collected these and other favorite puzzles designed to instruct and entertain math enthusiasts of all backgrounds. If idiots A and B alternately take aim at each other with a six-shot revolver containing one bullet, what is the probability idiot A will win? What are the chances it will snow on your birthday in any given year? How can researchers use coin flipping and the laws of probability to obtain honest answers to embarrassing survey questions? The solutions are presented here in detail, and many contain a profound element of surprise. And some puzzles are beautiful illustrations of basic mathematical concepts: "The Blind Spider and the Fly," for example, is a clever variation of a "random walk" problem, and "Duelling Idiots" and "The Underdog and the World Series" are straightforward introductions to binomial distributions. Written in an informal way and containing a plethora of interesting historical material, Duelling Idiots is ideal for those who are fascinated by mathematics and the role it plays in everyday life and in our imaginations. This book gives an introduction to the mathematics and applications comprising the new field of applied topology. The elements of this subject are surveyed in the context of applications drawn from the biological, economic, engineering, physical, and statistical sciences. Nick Higham follows up his successful HWMS volume with this much-anticipated second edition. The only program that supports the Common Core State Standards throughout four-years of high school mathematics with an unmatched depth of resources and adaptive technology that helps you differentiate instruction for every student. Connects students to math content with print, digital and interactive resources. Prepares students to meet the rigorous Common Core Standards with aligned content and focus on Standards of Mathematical Practice. Meets the needs of every student with resources that enable you to tailor your instruction at the classroom and individual level. Assesses student mastery and achievement with dynamic, digital assessment and reporting. Includes Print Student Edition

The First Conference on the History of Nordic Computing (HiNC1) was organized in Trondheim, in June 2003. The HiNC1 event focused on the early years of computing, that is the years from the 1940s through the 1960s, although it formally extended to year 1985. In the preface of the proceedings of HiNC1, Janis Bubenko, Jr. , John Impagliazzo, and Arne Sølvberg describe well the peculiarities of early Nordic computing [1]. While developing hardware was a necessity for the first professionals, quite soon the computer became an industrial product. Computer scientists, among others, grew increasingly interested in programming and application software. Progress in these areas from the 1960s to the 1980s was experienced as astonishing. The developments during these decades were taken as the focus of HiNC2. During those decades computers arrived to every branch of large and medium-sized businesses and the users of the computer systems were no longer only computer specialists but also people with other main duties. Compared to the early years of computing before 1960, where the number of computer projects and applications was small, capturing a holistic view of the history between the 1960s and the 1980s is considerably more difficult. The HiNC2 conference attempted to help in this endeavor. A step-by-step guide to successfully transforming any organization It is well recognized that succeeding at innovation is fundamental in today's hyper-competitive global marketplace. It is the only way to outperform current and emerging competitors sustainably. But what we call "innovation" is messy and difficult and too often lacks the rigor and discipline of other management processes. "The Innovator's Field Guide: Market Tested Methods and Frameworks to Help You Meet Your Innovation Challenges" changes that. It is a practical guide that moves beyond the "why" to the "how" of making innovation happen, for leaders and practitioners inside organizations of all sizes. Written by two pioneers in the field of embedding innovation in organization, "The Innovator's Field Guide" focuses on the most pressing innovation problems and specific challenges innovation leaders will face and offers concrete solutions, tools, and methods to overcome them. Each chapter describes a specific innovation challenge and details proven ways to address that challenge. Includes practical ideas, techniques, and leading practices. Describes common obstacles and offers practical solutions. Any leader or professional who needs concrete solutions--right now--to the critical challenges of innovation will find invaluable aid in the practical, easy-to-understand, and market-tested approaches of "The Innovator's Field Guide." Praise for Bayes Rules!: An Introduction to Applied Bayesian Modeling "A thoughtful and entertaining book, and a great way to get started with Bayesian analysis." Andrew Gelman, Columbia University "The examples are modern, and even many frequentist intro books ignore important topics (like the great p-value debate) that the authors address. The focus on simulation for understanding is excellent." Amy Herring, Duke University "I sincerely believe that a generation of students will cite this book as inspiration for their use of – and love for – Bayesian statistics. The narrative holds the reader's attention and flows naturally – almost conversationally. Put simply, this is perhaps the most engaging introductory statistics textbook I have ever read. [It] is a natural choice for an introductory undergraduate course in applied Bayesian statistics." Yue Jiang, Duke University "This is by far the best book I've seen on how to (and how to teach students to) do Bayesian modeling and understand the underlying mathematics and computation. The authors build intuition and scaffold ideas expertly, using interesting real case studies, insightful graphics, and clear explanations. The scope of this book is vast – from basic building blocks to hierarchical modeling, but the authors' thoughtful organization allows the reader to navigate this journey smoothly. And impressively, by the end of the book, one can run sophisticated Bayesian models and actually understand the whys, whats, and hows." Paul Roback, St. Olaf College "The authors provide a compelling, integrated, accessible, and non-religious introduction to statistical modeling using a Bayesian approach. They outline a principled approach that features computational implementations and model assessment with ethical implications interwoven throughout. Students and instructors will find the conceptual and computational exercises to be fresh and engaging." Nicholas Horton, Amherst College An engaging, sophisticated, and fun introduction to the field of Bayesian statistics, Bayes Rules!: An Introduction to Applied Bayesian Modeling brings the power of modern Bayesian thinking, modeling, and computing to a broad audience. In particular, the book is an ideal resource for advanced undergraduate statistics students and practitioners with comparable experience. Bayes Rules! empowers readers to weave Bayesian approaches into their everyday practice. Discussions and applications are data driven. A natural progression from fundamental to multivariable, hierarchical models emphasizes a practical and generalizable model building process. The evaluation of these Bayesian models reflects the fact that a data analysis does not exist in a vacuum. Features

- Utilizes data-driven examples and exercises.
- Emphasizes the iterative model building and evaluation process.
- Surveys an interconnected range of multivariable regression and classification models.
- Presents fundamental Markov chain Monte Carlo simulation.
- Integrates R code, including RStan modeling tools and the bayesrules package.
- Encourages readers to tap into their intuition and learn by doing.
- Provides a friendly and inclusive introduction to technical Bayesian concepts.
- Supports Bayesian applications with foundational Bayesian theory.

Berkeley's philosophy has been much studied and discussed over the years, and a growing number of scholars have come to the realization that scientific and mathematical writings are an essential part of his philosophical enterprise. The aim of this volume is to present Berkeley's two most important scientific texts in a form which meets contemporary standards of scholarship while rendering them accessible to the modern reader. Although editions of both are contained in the fourth volume of the Works, these lack adequate introductions and do not provide complete and corrected texts. The present edition contains a complete and critically established text of both De Motu and The Analyst, in addition to a new translation of De Motu. The introductions and notes are designed to provide the background necessary for a full understanding of Berkeley's account of science and mathematics. Although these two texts are very different, they are united by a shared concern with the work of Newton and Leibniz. Berkeley's De Motu deals extensively with Newton's Principia and Leibniz's Specimen Dynamicum, while The Analyst critiques both Leibnizian and Newtonian mathematics. Berkeley is commonly thought of as a successor to Locke or Malebranche, but as these works show he is also a successor to Newton and Leibniz. There is an explosion of interest in Bayesian statistics, primarily because recently created computational methods have finally made Bayesian analysis tractable and accessible to a wide audience. Doing Bayesian Data Analysis, A Tutorial Introduction with R and BUGS, is for first year graduate students or advanced undergraduates and provides an accessible approach, as all mathematics is explained intuitively and with concrete examples. It assumes only algebra and 'rusty' calculus. Unlike other textbooks, this book begins with the basics, including essential concepts of probability and random sampling. The book gradually climbs all the way to advanced hierarchical modeling methods for realistic data. The text provides complete examples with the R programming language and BUGS software (both freeware), and begins with basic programming examples, working up gradually to complete programs for complex analyses and presentation graphics. These templates can be easily adapted for a large variety of students and their own research needs. The textbook bridges the students from their undergraduate training into modern Bayesian methods. Accessible, including the basics of essential concepts of probability and

random sampling Examples with R programming language and BUGS software Comprehensive coverage of all scenarios addressed by non-bayesian textbooks- t-tests, analysis of variance (ANOVA) and comparisons in ANOVA, multiple regression, and chi-square (contingency table analysis). Coverage of experiment planning R and BUGS computer programming code on website Exercises have explicit purposes and guidelines for accomplishment This textbook introduces the basic notions of group theory by a thorough treatment of important examples, including complex numbers, modular arithmetic, symmetries, and permutations. Also included are applications to communications, cryptography, and coding theory. Every serious student of Japanese needs a reliable and user-friendly dictionary in their collection. Tuttle Concise Japanese Dictionary, now with 30% more content, is a completely updated dictionary designed for students and business people who are living in Japan and using the Japanese language on a daily basis. Its greatest advantage is that it contains recent idiomatic expressions which have become popular in the past several years and which are not found in other competing dictionaries. The dictionary has been fully updated with the addition of recent vocabulary relating to computers, mobile phones, social media and the Internet. Other special features that set this dictionary apart include: Over 25,000 words and expressions including idioms and slang. User-friendly layout with main entries in color. Complete Japanese-English and English-Japanese sections. Romanized forms and the Japanese script are given for all Japanese words. A guide to pronunciation helps the user to pronounce Japanese words correctly. Different senses of each word are distinguished by multiple definitions. Your students will develop a greater understanding of the math concepts required for mastery of the new NCTM Standards. Easy-to-follow instructions, fun-to-solve puzzles and riddles, and many self-checking activities make these books a hit in any middle school math class. A revised textbook for introductory courses in numerical methods, MATLAB and technical computing, which emphasises the use of mathematical software. Networks are everywhere: networks of friends, transportation networks and the Web. Neurons in our brains and proteins within our bodies form networks that determine our intelligence and survival. This modern, accessible textbook introduces the basics of network science for a wide range of job sectors from management to marketing, from biology to engineering, and from neuroscience to the social sciences. Students will develop important, practical skills and learn to write code for using networks in their areas of interest - even as they are just learning to program with Python. Extensive sets of tutorials and homework problems provide plenty of hands-on practice and longer programming tutorials online further enhance students' programming skills. This intuitive and direct approach makes the book ideal for a first course, aimed at a wide audience without a strong background in mathematics or computing but with a desire to learn the fundamentals and applications of network science. NEW YORK TIMES BESTSELLER • The superbly researched, spellbindingly told story of athlete, showman, philosopher, and boundary breaker Leroy “Satchel” Paige “Among the rare biographies of an athlete that transcend sports . . . gives us the man as well as the myth.”—The Boston Globe Few reliable records or news reports survive about players in the Negro Leagues. Through dogged detective work, award-winning author and journalist Larry Tye has tracked down the truth about this majestic and enigmatic pitcher, interviewing more than two hundred Negro Leaguers and Major Leaguers, talking to family and friends who had never told their stories before, and retracing Paige’s steps across the continent. Here is the stirring account of the child born to an Alabama washerwoman with twelve young mouths to feed, the boy who earned the nickname “Satchel” from his enterprising work as a railroad porter, the young man who took up baseball on the streets and in reform school, inventing his trademark hesitation pitch while throwing bricks at rival gang members. Tye shows Paige barnstorming across America and growing into the superstar hurler of the Negro Leagues, a marvel who set records so eye-popping they seemed like misprints, spent as much money as he made, and left tickets for “Mrs. Paige” that were picked up by a different woman at each game. In unprecedented detail, Tye reveals how Paige, hurt and angry when Jackie Robinson beat him to the Majors, emerged at the age of forty-two to help propel the Cleveland Indians to the World Series. He threw his last pitch from a big-league mound at an improbable fifty-nine. (“Age is a case of mind over matter,” he said. “If you don’t mind, it don’t matter.”) More than a fascinating account of a baseball odyssey, Satchel rewrites our history of the integration of the sport, with Satchel Paige in a starring role. This is a powerful portrait of an American hero who employed a shuffling stereotype to disarm critics and racists, floated comical legends about himself—including about his own age—to deflect inquiry and remain elusive, and in the process methodically built his own myth. “Don’t look back,” he famously said. “Something might be gaining on you.” Separating the truth from the legend, Satchel is a remarkable accomplishment, as large as this larger-than-life man. Fundamentals of Signal Processing for Sound and Vibration Engineers is based on Joe Hammond’s many years of teaching experience at the Institute of Sound and Vibration Research, University of Southampton. Whilst the applications presented emphasise sound and vibration, the book focusses on the basic essentials of signal processing that ensures its appeal as a reference text to students and practitioners in all areas of mechanical, automotive, aerospace and civil engineering. Offers an excellent introduction to signal processing for students and professionals in the sound and vibration engineering field. Split into two parts, covering deterministic signals then random signals, and offering a clear explanation of their theory and application together with appropriate MATLAB examples. Provides an excellent study tool for those new to the field of signal processing. Integrates topics within continuous, discrete, deterministic and random signals to facilitate better understanding of the topic as a whole. Illustrated with MATLAB examples, some using ‘real’ measured data, as well as fifty MATLAB codes on an accompanying website. This textbook provides an accessible and self-contained description of the Galerkin finite element method for the two important models of continuum mechanics, transient heat conduction and elastodynamics, from formulation of the governing equations to implementation in Matlab. The coverage follows an intuitive approach: the salient features of each initial boundary value problem are reviewed, including a thorough description of the boundary conditions; the method of weighted residuals is applied to derive the discrete equations; and clear examples are introduced to illustrate the method. This expanded edition of the original bestseller, How to Teach Mathematics, offers hands-on guidance for teaching mathematics in the modern classroom setting. Twelve appendices have been added that are written by experts who have a wide range of opinions and viewpoints on the major teaching issues. Eschewing generalities, the award-winning author and teacher, Steven Krantz, addresses issues such as preparation, presentation, discipline, and grading. He also emphasizes specifics—from how to deal with students who beg for extra points on an exam to mastering blackboard technique to how to use applications effectively. No other contemporary book addresses the principles of good teaching in such a comprehensive and cogent manner. The broad appeal of this text makes it accessible to areas other than mathematics. The principles presented can apply to a variety of disciplines—from music to English to business. Lively and humorous, yet serious and sensible, this volume offers readers incisive information and practical applications. Easy to understand and fun to read, this updated edition of Introducing Python is ideal for beginning programmers as well as those new to the language. Author Bill Lubanovic takes you from the basics to more involved and varied topics, mixing tutorials with cookbook-style code recipes to explain concepts in Python 3. End-of-chapter exercises help you practice what you’ve learned. You’ll gain a strong foundation in the language, including best practices for testing, debugging, code reuse, and other development tips. This book also shows you how to use Python for applications in business, science, and the arts, using various Python tools and open source packages. This engaging review guide and workbook is the ideal tool for sharpening your Algebra I skills! This review guide and workbook will help you strengthen your Algebra I knowledge, and it will enable you to develop new math skills to excel in your high school classwork and on standardized tests. Clear and concise explanations will walk you step by step through each essential math concept. 500 practical review questions, in turn, provide extensive opportunities for you to practice your new skills. If you are looking for material based on national or state standards, this book is your ideal study tool! Features: • Aligned to national standards, including the Common Core State Standards, as well as the standards of non-Common Core states and Canada • Designed to help you excel in the classroom and on standardized tests • Concise, clear explanations offer step-by-step instruction so you can easily grasp key concepts • You will learn how to apply Algebra I to practical situations • 500 review questions provide extensive opportunities for you to practice what you’ve learned This engaging and clearly written textbook/reference provides a must-have introduction to the rapidly emerging interdisciplinary field of data science. It focuses on the principles fundamental to becoming a good data scientist and the key skills needed to build systems for collecting, analyzing, and interpreting data. The Data Science Design Manual is a source of practical insights that highlights what really matters in analyzing data, and provides an intuitive understanding of how these core concepts can be used. The book does not emphasize any particular programming language or suite of data-analysis tools, focusing instead on high-level discussion of important design principles. This easy-to-read text ideally serves the needs of undergraduate and early graduate students embarking on an “Introduction to Data Science” course. It reveals how this discipline sits at the intersection of statistics, computer science, and machine learning, with a distinct heft and character of its own. Practitioners in these and related fields will find this book perfect for self-study as well. Additional learning tools: Contains “War Stories,” offering perspectives on how data science applies in the real world Includes “Homework Problems,” providing a wide range of exercises and projects for self-study Provides a complete set of lecture slides and online video lectures at www.data-manual.com Provides “Take-Home Lessons,” emphasizing the big-picture concepts to learn from each chapter Recommends exciting “Kaggle Challenges” from the online platform Kaggle Highlights “False Starts,” revealing the subtle reasons why certain approaches fail Offers examples taken from the data science television show “The Quant Shop” (www.quant-shop.com)