Telegraphic Reviews

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TELEGRAPHIC REVIEWS

Reference, P. *Handbook of Numerical Analysis, Volume VI.* Eds: P.G. Ciarlet, J.L. Lions. Elsevier Science, 1998, x + 689 pp, $164. [ISBN 0-444-82569-X]   Three articles in two sections: "Numerical Methods for Solids (Part 3)" and "Numerical Methods for Fluids (Part 1)."

Mathematics Appreciation, S, L. *Strength in Numbers.* Sherman K. Stein. Wiley, 1996, xiii + 272 pp, $16.95 (P).   [ISBN 0-471-32974-6]   Subtitle (*Discovering the Joy and Power of Mathematics in Everyday Life*) is apt. Bits of real mathematics are described, explained, put in context, and admired. Requires only high school background; less in most parts. Clear, friendly, sometimes elegant; even the polemics are fun.   PZ

Mathematics Appreciation, P, L. *Drawbridge Up: Mathematics—A Cultural Anathema.* Hans Magnus Enzensberger. Transl: Tom Artin. AK Peters, 1999, 48 pp, $5 (P). [ISBN 1-56881-099-7]   A bilingual pamphlet (German original and English translation) containing the text of a talk given by poet and writer Enzensberger at the 1998 ICM meeting in Berlin. A lamentation over the "increasingly critical" paradox of the cultural isolation of mathematics at the peak of its "golden age" marked by "spectacular" achievements and applications. LAS

Recreational Mathematics, S, L*. *The Mathemagician and Pied Puzzler: A Collection in Tribute to Martin Gardner.* Eds: Elwyn Berlekamp, Tom Rodgers. AK Peters, 1999, x + 266 pp, $34 (P). [ISBN 1-56881-075-X] Proceedings of the first "gathering for Gardner" held in 1993. Games, puzzles, and recreational mathematics—all accessible to general readers—contributed by the world's foremost magicians, puzzlists, and mathematicians. LCL

History, S(14–17), P, L**. *Euler: The Master of Us All.* William Dunham. Dolciana Math. Expos., No. 22. MAA, 1999, xxviii + 185 pp, $29.95 (P). [ISBN 0-88385-328-0]   A necessarily sparse sample of Euler's major contributions to diverse areas of mathematics (number theory, infinite series, complex variables, algebra, geometry, and combinatorics) conveyed in contemporary notation yet faithful to Euler's approach—even his occasional "mathematical madness." Each chapter sets the stage by describing clearly the efforts that preceded Euler, the magnitude of the challenge he faced, and the impact of the contribution he made. LAS

History, P. *Selected Publications of Eugene L. Lawler.* Eds: K. Aardal, *et al.* CWI Tract, V. 126. Centrum voor Wiskunde en Informatica, 1999, x + 318 pp, Dfl. 60 (P). [ISBN 90-6196-484-9]   26 of Lawler's technical and expository papers as well as a complete list of his publications.

Foundations, T(14), L. *An Introduction to Abstract Mathematics.* Robert J. Bond, William J. Keane. Brooks/Cole, 1999, xix + 323 pp. [ISBN 0-534-95950-7]   Based on a "transitions" course at Boston College. Chapters 1–5 introduce logic, sets, functions, relations, and the integers. Chapters 6–8 give applications to infinite sets, real and complex numbers, polynomials. Year of calculus assumed. Many examples and exercises. JD

Foundations, S(13–18), P, L*. *A Mathemat-*

ical Mystery Tour: Discovering the Truth and Beauty of the Cosmos. A.K. Dewdney. Wiley, 1999, vi + 218 pp, $22.95. [ISBN 0-471-23847-3]. An imaginative, meandering tour of mathematics in the service of resolving two abiding mysteries: mathematics' "unreasonable" utility, and whether it is discovered or created. Dewdney suggests that perhaps the Pythagoreans were right after all—that mathematics exists, awaiting discovery, in an other-worldly "holos" out of which the cosmos comes into being. LAS

Discrete Mathematics, T(13–15: 1, 2). *Discrete Mathematics and Its Applications, Fourth Edition.* Kenneth H. Rosen. McGraw-Hill, 1999, xxii + 804 pp. [ISBN 0-07-289905-0] New section on generating functions; more on rules of inference; ties to new web site. (*Second Edition*, TR, November 1991.) DB

Number Theory, T(14–16: 1, 2). *Elements of the Theory of Numbers.* Joseph B. Dence, Thomas P. Dence. Academic Pr, 1999, xvii + 517 pp. [ISBN 0-12-209130-2] Well-done but fairly standard introduction to number theory. Includes introduction to number fields and partition theory. DB

Number Theory, T(13–15: 1), L. *The Mathematics of Ciphers: Number Theory and RSA Cryptography.* S.C. Coutinho. AK Peters, 1999, xv + 196 pp, $30. [ISBN 1-56881-082-2] A gentle amd very readable introduction to number theory that culminates in the RSA public-key cryptosystem. DB

Linear Algebra, T(14). *Introduction to Linear Algebra.* Donald J. Wright. McGraw-Hill, 1999, ix + 392 pp. [ISBN 0-07-072098-3] From the Preface: "The goal is to learn to think in terms of linear algebra notions ... and that sort of familiarity comes from using the ideas in a substantive way." Contains a variety of useful examples. PF

Ring Theory, P, L. *Rings and Things and a Fine Array of Twentieth Century Associative Algebra.* Carl Faith. Math. Surv. & Mono., V. 65. AMS, 1999, xxxii + 422 pp, $99. [ISBN 0-8218-0993-8] Exhaustive survey of 125 years of associative algebras, ring and module theory. The author's *Algebra I* and *II* serve as the foundation for this survey. Also includes the author's thoughts on mathematics and mathematicians of the last 50 years. Bibliography has over 1600 references. JD

Algebra, T(17: 2), P, L. *Post-Modern Algebra.* Jonathan D.H. Smith, Anna B. Romanowska. Pure & Appl. Math. Wiley, 1999, xi + 370 pp, $69.95. [ISBN 0-471-12738-8] Introduction to algebra from an applications-based perspective. Traditional topics of groups, rings, fields, modules are accompanied by monoids, quasigroups, lattices, Boolean algebras, and more. Structures unified by techniques of universal algebra and category theory. JD

Algebra, P. *Differential and Difference Dimension Polynomials.* M.V. Kondratieva, et al. Math. & Its Applic., V. 461. Kluwer Academic, 1999, xiii + 422 pp. [ISBN 0-7923-5484-2]

Real Analysis, T*(16–17: 3), L. *A Course in Real Analysis.* John N. McDonald, Neil A. Weiss. Academic Pr, 1999, xvii + 745 pp. [ISBN 0-12-742830-5] Each chapter begins with a biography of a key contributor (from Cantor to Daubechies). Discusses the usual topics: set theory, real number system, Lebesgue theory, metric spaces. Further interest is piqued by chapters on probability, harmonic analysis, dynamical systems. Lots of exercises. Teachers of analysis—have a look! KS

Real Analysis, T(17), P. *Real Analysis—With an Introduction to Wavelet Theory.* Satoru Igari. Transl: Satoru Igari. Transl. of Math. Mono., V. 177. AMS, 1998, xiii + 256 pp, $89. [ISBN 0-8218-0864-8] Covers Lebesgue measure and integration, differentiation, abstract measures, L^p-spaces, distribution theory, Fourier analysis. Rather dry "definition-theorem-proof" exposition. Introduction to wavelets is very brief. BH

Partial Differential Equations, T(16: 1), C, L. *Partial Differential Equations and Boundary Value Problems with Maple V.* George A. Articolo. Academic Pr, 1998, xii + 628 pp, (P), with CD-ROM. [ISBN 0-12-064475-4] Traditional approach to PDEs incorporating a brief discussion of useful Maple commands and many problems solved using Maple. Begins with a review of ODEs and a chapter on Sturm–Liouville eigenvalue problems. Includes discussion of heat, wave, and Laplace equations. PG

Partial Differential Equations, P. *Differential Operators and Spectral Theory: M. Sh. Birman's 70th Anniversary Collection.* Eds: V. Buslaev, M. Solomyak, D. Yafaev. AMS Transl., Ser. 2, V. 189. AMS, 1999, viii + 285 pp, $99. [ISBN 0-8218-1387-0]

Functional Analysis, P. *Introduction to the Theory and Applications of Functional Differential Equations.* V. Kolmanovskii, A. Myshkis. Math. & Its Applic., V. 463. Kluwer Academic, 1999, xvi + 648 pp, $295. [ISBN 0-7923-5504-0]

Analysis, P. *Partial Differential and Inte-*

gral Equations. Eds: Heinrich G.W. Begehr, Robert P. Gilbert, Guo-Chun Wen. Intern. Soc. for Analy., Applic. & Computat., V. 2. Kluwer Academic, 1999, x + 369 pp, $168. [ISBN 0-7923-5482-6] Proceedings of a 1997 congress. Topics: function theoretic and functional analytic methods for PDEs; applications of function theory of several complex variables to PDEs; integral equations and boundary value problems; PDEs.

Algebraic Geometry, P. *Mirror Symmetry and Algebraic Geometry.* David A. Cox, Sheldon Katz. Math. Surveys & Mono., V. 68. AMS, 1999, xxi + 469 pp, $69. [ISBN 0-8218-1059-6] Supersymmetric string theories exhibit interesting properties yet have shaky foundations, unverified by experiment. Exposits the algebraic geometry likely needed for a firm mathematical foundation. "Mirror pairs" of Calabi–Yau manifolds play a central role. RM

Algebraic Geometry, P. *The Curves Seminar at Queen's, Volume XII.* Ed: Anthony V. Geramita. Pure & Appl. Math., V. 114. Queen's Univ, 1998, 162 pp, (P). [ISBN 0-88911-832-9] Includes an expository paper on "Computational Invariant Theory" by Gregor Kemper as well as five contributed notes.

Differential Geometry, T?(17–18: 1), P. *Meromorphic Functions and Projective Curves.* Kichoon Yang. Math. & Its Applic., V. 464. Kluwer Academic, 1999, viii + 201 pp, $105. [ISBN 0-7923-5505-9] Concise, self-contained introduction and exposition of meromorphic functions of algebraic curves from a geometric viewpoint. Topics include Brill–Noether theory, projective differential geometry, minimal surfaces in Kahler manifolds. RM

Topology, T(17: 2), P, L. *Aspects of Topology, Second Edition.* Charles O. Christenson, William L. Voxman. BCS Associates, 1998, x + 493 pp, $48 (P); $75. [ISBN 0-914351-08-7; 0-914351-07-9] Topics include topological spaces, continua, homotopy theory, *n*-manifolds, and dimension theory. Changes from *First Edition* (TR, April 1978): rewrites on CW-complexes and covering spaces, various clarifications. JD

Operations Research, T(17–18: 1), P. *Geometric Methods and Optimization Problems.* V. Boltyanski, H. Martini, V. Soltan. Comb. Optim., V. 4. Kluwer Academic, 1999, viii + 429 pp, $204. [ISBN 0-7923-5454-0] Applies methods from convex geometry to solve optimization problems in control theory (modern variational geometry), location science, and computational geometry. Many intuitive diagrams motivate the ideas. RM

Optimization, T*(15–16: 1). *Practical Genetic Algorithms.* Randy L. Haupt, Sue Ellen Haupt. Wiley, 1998, xiv + 177 pp, $44.95. [ISBN 0-471-18873-5] Genetic algorithms use the model of evolutionary selection to solve a wide variety of optimization problems. Text starts with the basics of optimization and then shows how both discrete and continuous problems can be attacked using genetic algorithms. Many applications, some pseudocode, good references. No exercises. All in all, an interesting book. MPR

Optimization, P. *Minimax Theorems and Qualitative Properties of the Solutions of Hemivariational Inequalities.* D. Motreanu, P.D. Panagiotopoulos. Nonconvex Optim. & Its Applic., V. 29. Kluwer Academic, 1999, xviii + 309 pp, $156. [ISBN 0-7923-5456-7]

Optimization, P. *Reformulation: Nonsmooth, Piecewise Smooth, Semismooth and Smoothing Methods.* Eds: Masao Fukushima, Liqun Qi. Appl. Optim., V. 22. Kluwer Academic, 1999, viii + 441 pp, $194. [ISBN 0-7923-5320-X] 22 refereed papers; most based on talks given at the 16th International Symposium on Mathematical Programming held at Lausanne, EPFL, Switzerland, in 1997.

Elementary Statistics, T(17: 1), C. *Data, Statistics, and Decision Models with Excel.* Donald L. Harnett, James F. Horrell. Wiley, 1998, xviii + 605 pp, $93.95, with disks. [ISBN 0-471-13398-1] Conceptual modeling and statistics text for MBA students. Emphasizes problem solving and decision making; calculus not required. Integrates use of Excel. Disks contain data and an Excel add-in. HS

Elementary Statistics, T(14: 2). *Introduction to Probability and Statistics for Scientists and Engineers.* Walter A. Rosenkrantz. Ser. in Prob. & Stat. McGraw-Hill, 1997, xiv + 592 pp. [ISBN 0-07-053988-X] Covers basic probability theory, sampling distributions, estimation, inference, linear and multiple regression, ANOVA, block designs, and control charts. MPR

Mathematical Statistics, T(15: 1). *Mathematical Statistics: An Introduction.* Wiebe R. Pestman. Walter de Gruyter, 1998, ix + 545 pp, $79 (P). [ISBN 3-11-015356-4] Theoretically rigorous introduction; includes a chapter on probability theory. Assumes knowledge of calculus and linear algebra. Companion volume (see following review) contains solutions to all 260 exercises. HS

Mathematical Statistics, S. *Mathematical Statistics: Problems and Detailed Solutions.*

Wiebe R. Pestman, Ivo B. Alberink. Walter de Gruyter, 1998, ix + 325 pp, $79 (P). [ISBN 3-11-015358-0] Detailed solutions to all 260 exercises in Pestman's *Mathematical Statistics: An Introduction* (see previous review). HS

Statistical Methods, T(18:2), P. *Statistical Learning Theory.* Vladimir N. Vapnik. Wiley, 1998, xxiv + 736 pp, $105. [ISBN 0-471-03003-1] Statistical learning theory explores ways of estimating functional dependency from a given collection of data for small samples without *a priori* knowledge about the problem to be solved. This comprehensive study of learning processes contains: general qualitative theory including necessary and sufficient conditions for consistency; general quantitative theory including bounds on the rate of convergence; principles for estimating functions from small data sets; methods of function estimation; applications to real-life problems. KB

Statistical Methods, T(16–17: 1), P. *Sampling of Populations: Methods and Applications, Third Edition.* Paul S. Levy, Stanley Lemeshow. Ser. in Prob. & Stat. Wiley, 1999, xxxi + 525 pp, $89.95. [ISBN 0-471-15575-6] Refines *Second Edition*'s treatment of telephone sampling and interviewing methodology. Material on survey data analysis now discusses use of appropriate software. HS

Statistical Methods, P. *The Analysis of Variance.* Henry Scheffé. Wiley Classics Library. Wiley, 1999, xvi + 477 pp, $49.95 (P). [ISBN 0-471-34505-9] Paperback printing of text originally published in 1959.

Statistics, C. *JMP Start Statistics: A Guide to Statistics and Data Analysis Using JMP and JMP IN Software.* John Sall, Ann Lehman. Duxbury Pr (Wadsworth), 1996, xxii + 521 pp, $61.95 (P), with disks. [ISBN 0-534-26565-0] Detailed introduction to JMP and JMP IN. Step-by-step instructions on how to perform many common statistical tests and procedures. Very thorough; many screen shots. MPR

Statistics, P. *Entropy Methods in Statistical Estimation.* M.H. Wegkamp. CWI Tract, V. 125. Centrum voor Wiskunde en Informatica, 1998, 120 pp, Dfl. 35 (P). [ISBN 90-6196-483-0]

Mathematical Computing, T(15–16), S. *Advanced Engineering Mathematics with Mathematica and MATLAB, Volume 1.* Reza Malek-Madani. Addison-Wesley, 1998, xiv + 558 pp, (P). [ISBN 0-201-59881-7] After brief introductions to Mathematica and MATLAB, covers ODEs, transform methods, linear algebra, systems of DEs, and numerical methods. Nice in-troduction to the use of these packages. Plenty of exercises. MPR

Computer Science, T(18), P. *Queueing Networks and Markov Chains: Modeling and Performance Evaluation with Computer Science Applications.* Gunter Bolch, *et al.* Wiley, 1998, xvi + 726 pp, $89.95. [ISBN 0-471-19366-6] Presents the theory of computer performance analysis from the perspective of queueing theory and Markov chains. Applications include client-server systems, polling systems, operating systems, ATM networks. MPR

Applications (Biological Science), P. *Mathematical and Computational Biology: Computational Morphogenesis, Hierarchical Complexity, and Digital Evolution.* Ed: Chrystopher L. Nehaniv. Lect. on Math. in the Life Sci., V. 26. AMS, 1999, xi + 201 pp, $59 (P). [ISBN 0-8218-0941-5] Proceedings of a 1997 workshop at the University of Aizu, Japan.

Applications (Physics), T(17: 2), P. *Geometry, Particles, and Fields.* Bjørn Felsager. Grad. Texts in Contemp. Physics. Springer-Verlag, 1998, x + 672 pp, $69.95. [ISBN 0-387-98267-1] Geometric approach to modern particle field theory. First half is a relatively self-contained introduction to field theory, with an emphasis on gauge theory and nonlinear field theory. Second half is an introduction to differential geometry and its application to field theory. MPR

Applications (Statistical Mechanics), T*(16–17: 2), P*. *A Modern Course in Statistical Physics, Second Edition.* L.E. Reichl. Wiley, 1998, xix + 822 pp, $84.95. [ISBN 0-471-59520-9] Thorough, self-contained introduction to statistical mechanics using thermodynamics and probability theory as a foundation. Especially interesting for its extended coverage of non-equilibrium processes. Excellent examples and exercises. An outstanding choice for either a text or a reference. MPR

Applications, P. *Traffic Control and Transport Planning: A Fuzzy Sets and Neural Networks Approach.* Dušan Teodorović, Katarina Vukadinović. Intern. Ser. in Intelligent Tech. Kluwer Academic, 1998, xviii + 387 pp, $150. [ISBN 0-7923-8380-X]

Reviewers

KB: Karla Ballman, Macalester; DB: David Bressoud, Macalester; JD: Jill Dietz, St. Olaf; PF: Paul Froeschl, Macalester; PG: Philip Gloor, St. Olaf; BH: Bruce Hanson, St. Olaf; LCL: Loren C. Larson, St. Olaf; RM: Richard Molnar, Macalester; AO: Arnold Ostebee, St. Olaf; MPR: Matthew P. Richey, St. Olaf; KS: Karen Saxe, Macalester; HS: Heidi Shierholz, St. Olaf; LAS: Lynn Arthur Steen, St. Olaf; PZ: Paul Zorn, St. Olaf.