analysis qualifying exams. **Summing Up:** Recommended. ★★ Upper-division undergraduates and graduate students.—*F. E. J. Linton, emeritus, Wesleyan University*

47-4471 TA330 MARC

Holmes, Mark H. **Introduction to the foundations of applied mathematics.** Springer, 2009. 467p bibl index afp (Texts in applied mathematics, 56) ISBN 9780387877495, $69.95

This work by Holmes (RPI) is a thorough overview of classical analysis/differential equations-based applied mathematics (not statistics or discrete mathematics). The book begins with a three-chapter review of four of the most important general concepts in applied mathematics: dimensional analysis, perturbation theory, reaction kinetics, and stability. It moves to a sequence of transport/flow problems: diffusion (random walks, Brownian motion), traffic flow, and fluid dynamics (Couette, Poiseuille, vortex, and potential flows). These latter chapters include discussions of materials topics and the consequences of Newton's second law (the material derivative, elasticity, stress/strain) in one and three dimensions. This is a wonderful, well-written book that should be in every academic library. Includes many examples, 126 references, and 221 exercises. **Summing Up:** Highly recommended. ★★★ Upper-division undergraduates, graduate students, researchers, and faculty.—*J. D. Fehribach, Worcester Polytechnic Institute*

47-4472 QA37 2009-9644 CIP

Johnston, William. **A transition to advanced mathematics: a survey course,** by William Johnston and Alex M. McAllister. Oxford, 2009. 745p bibl index afp ISBN 9780195310764, $79.95

A Transition to Advanced Mathematics by Johnston (Randolph-Macon College) and McAllister (Centre College) provides material for a mathematics "bridge" course. In the preface, the authors indicate that the work "promotes the goals of a 'transition' course [and] ... a 'survey' course." This means that throughout the book, the authors provide both a transition to higher abstract thinking about mathematics and a preview of higher-level mathematical material. Given the nature of the book and the fact that it is written for a sophomore-level course, a successful student would have at least a background in calculus. A valuable feature is the different types of questions and exercises. The "Reading Questions" in each section are a useful tool; students can answer these questions before coming to class on the day that the relevant material is presented. In addition, 70 exercises at the end of each chapter give students the opportunity for plenty of practice on their own. Professors will benefit from each chapter's optional application section, offering flexibility for teaching purposes. Overall, this book is a readable, comprehensive resource for transitioning to higher mathematical thinking. **Summing Up:** Highly recommended. ★★★ Lower-division undergraduates.—*S. L. Sullivan, Catawba College*

47-4473 QA611 MARC

Krantz, Steven G. **A guide to topology.** Mathematical Association of America, 2009. 106p bibl index (MAA guides, 4) ISBN 9780883853467, $49.95

The intention of the MAA series of guides is to support graduate education in mathematics by providing thumbnail sketches of subject areas that a student might use as a starting point or as a review. The guides are not meant to substitute for the more central works in the subject, but to give an overview—brief and motivated. Topology in this guide by Krantz (Washington Univ., St. Louis) is point-set topology, which serves as the deep foundations of analysis. These aspects of topology occupy the first half of the usual first graduate course. The author's depth in analysis is apparent in his choices of topics for such a short book. The context for the general notions outlined in the first chapter is the final chapter, "Function Spaces," which includes the Weierstrass approximation theorem and the Ascoli-Arzela theorem. The inclusion of such topics as nets, uniformities, and Morse theory is unexpected. The book covers the main ideas well, and the guide will be helpful as intended. Other guides dealing with the more algebraic aspects of topology are needed. A valuable addition to a serious mathematics library. **Summing Up:** Recommended. ★★ Graduate students.—*J. McCleary, Vassar College*

47-4474 QA11 MARC

Kumar, B. N. **Major revision facts in mathematics.** University Press of America, 2009. 67p afp ISBN 9780761847847 pbk, $16.99

This work by Kumar (Wagner College), designed to assist students preparing for standard exams, contains notes on 34 topics. The two-to-four-page presentations address topics such as quadratic equations, logarithms, permutations, trig functions, tangents, motion, and work. Some readers may find the terminology confusing (e.g., "gradient" rather than "slope"; "convex downward" rather than "concave upward"). Accuracy is suspect. For example, the author states that in a quadratic equation, if the discriminant is zero, the equal roots are "real, equal and rational," but a quadratic in which the coefficients are $a = 1$, $b = \text{sqrt}(3)$, and $c = 3/4$, has a zero discriminant and an irrational root. Care in editing is lacking. One finds "$\sin 2A = a \sin A \times \cos A$." When considering the binomial series for negative integer and fractional powers, the text reads "a must equal," leaving the reader to wonder what should follow. Upper case is exchanged for lower case haphazardly ("If $N = aY$, then $y = \log_a N$"). Both the symbol x and a period (.) are used for multiplication ("$\cos A \times \cos B$" and "$u \cdot v$"). To conclude, the author's intent is good; however, those needing the review will be challenged by a lack of care in production. **Summing Up:** Not recommended.—*W. R. Lee, formerly, Iowa State University*

47-4475 QA279 2009-8345 CIP

Parmigiani, Giovanni. **Decision theory: principles and approaches,** by Giovanni Parmigiani, Lurdes Y.T. Inoue; with Hedibert F. Lopes. Wiley-Blackwell, 2009. 372p bibl index ISBN 047149657X, $100.00; ISBN 9780471496571, $100.00

This book is designed for graduate students in statistics and biostatistics at both the master's and PhD levels. The work's novel feature, as Parmigiani (Johns Hopkins) and Inoue (Univ. of Washington) point out in the preface, is that instead of using a standard textbook format, they have "selected a set of exciting papers and book chapters, and developed a self-contained lecture around each one." These selections fall into three broad categories that constitute the three parts of the book. The first part, "Foundations," discusses utility in two separate chapters, Ramsey and Savage theories, and more. Part 2, "Statistical Decision Theory," includes a chapter titled "Decision Functions." "Optimal Design," the final section, contains chapters titled "Dynamic Programming" and "Sample Size." The authors are to be commended on their attractive approach, which seems to work very well. The extensive list of references at the end, in addition to the key articles in each chapter, makes the book a valuable reference that should be in all libraries supporting advanced students in statistics and its applications. It can also serve as a good textbook in these areas. **Summing Up:** Recommended. ★★ Graduate students and above.—*R. Bharath, emeritus, Northern Michigan University*