FOR YOUR information

PUBLICATIONS

Using Classroom Assessment to Improve Student Learning, Anne M. Collins, ed., 2011. 138 pp., $36.95 paper. ISBN 978-0-87353-660-8. Stock no. 13593. National Council of Teachers of Mathematics; www.nctm.org.

Collins and her team provide a robust resource to assist teachers and teacher educators with formative assessment strategies. In keeping with the intent of NCTM's *Principles and Standards for School Mathematics* (2000), *Curriculum Focal Points* (2006), and the Common Core State Standards, the authors emphasize that students are expected to be engaged in solving problems that address grade-level topics at high levels of cognitive demand. Based on research that suggests the power of formative assessments in focusing instruction, this tool provides sample grade-specific problems that demonstrate the process that teachers can use to gather evidence about student understanding.

Teachers and teacher educators should use this resource as a tool kit for framing formative assessment and gathering evidence about student understanding. The authors describe nine practices that require practitioners to think differently about how to engage students in doing mathematics and how to determine daily instructional goals and activities.

Following the easy-to-read background content, chapters 3 through 5 present specific formative assessment problems aligned with the Common Core State Standards for grades 5 through 8. Each item includes student work and notes provided by the author to help readers analyze the student's response and frame instruction that takes into account student misunderstanding. Web resources provide print-ready problems for the examples given.

Collins and her team also provide a structured professional development plan using the components of the tools.

—Charles D. Watson
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FROM OTHER PUBLISHERS

The Cambridge Companion to Frege, Michael Potter and Tom Ricketts, eds., 2010. 660 pp., $38.99 paper. ISBN 978-0-251-62479-4. Cambridge University Press; www.cambridge.org.
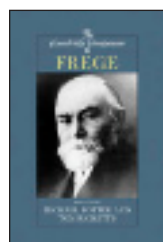
The latest volume in a distinguished series published by Cambridge University Press, *The Cambridge Companion to Frege* joins the four previous volumes (on Descartes, Hume, Plato, and Locke) on my bookshelf at home. The introduction, by Michael Potter, includes a short biography and an overview of the works, thinking, and impact of Gottlob Frege, one of the great modern philosophers. As with other volumes in the series, the book consists of essays written by experts in the field.

Frege (1848–1925) was a German mathematician who set out to show that arithmetic must be derivable from logic. He developed a syntax for logical analysis, and his work influenced many other mathematicians-philosophers, including Russell and Wittgenstein. Frege's work is considered the beginning of modern logical analysis. His writing remains current, however, because of his analysis of language.

For instance, Frege distinguished between the idea of describing something and the idea of the thing itself. We can see this distinction in the difference between the number 4 and a pile of four things whose quantity the number describes. Classroom teachers will recognize this difficulty immediately—how many of us have had a student subtract x from $5x$ to arrive at 5?

Although intended for the general reader, this book is a dense read. However, it provides a wonderful look at both Frege's work and his continuing impact on philosophy. It is not intended for the classroom but is instead a deeply thoughtful look at a mathematician's ideas about the essence of things.

—Greg Stephens
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Hungarian Problem Book IV, translated and edited by Robert Barrington Leigh and Andy Liu, 2011. 114 pp., $40.95 paper. ISBN 978-0-88385-831-8. Mathematical Association of America; www.maa.org.

In 1894, the physicist Baron Lorand Eotvos, then the Hungarian minister of culture and education, directed the Hungarian Physical and Mathematical

Society to develop and organize yearly mathematics competitions for students at the high school level. The material covered by the problems stops just short of the topic of limit and the beginnings of calculus. Thus, depth of understanding of "elementary" mathematics rather than, for example, breadth of coverage for the Advanced Placement syllabus is required of competitive students. Each contest poses three problems that challenge the understanding and skills of the best young mathematicians in combinatorics and graph theory, number theory, algebra and inequalities, plane and solid geometry, and trigonometry.

The first chapter presents, in chronological order, the forty-eight problems developed for the years 1947–63. The second chapter lists the theorems with which contestants must be familiar to tackle the problems set for them. It should be fascinating for both students and their teachers today to see such lovely "elementary" results that are missing in their mathematics courses as they hurry on to Advanced Placement calculus.

Solutions are given in the third chapter, where problems are grouped by mathematical category rather than by the chronological order in which they were posed. Several alternate solutions are given for many of the uniformly elegant problems. Solving a problem for oneself does lift one's mathematical spirits, but reading a nice solution after a reasonable but unsuccessful struggle does have its rewards too. In any event, pleasure and intellectual gain await those who read and ponder the problems offered here.

In the fourth and final chapter, the editors discuss extensions and generalizations of some of these problems and recall related problems from contests held before 1947. This final chapter further enriches an already rich problem-solving adventure.

By virtue of the elegant problems that it poses, the clarity of the solutions that it offers, and the traditions that it preserves, *Hungarian Problem Book IV*

deserves a place on the shelf of any high school classroom in which mathematics is taught and learned with serious intent.

—*James N. Boyd*
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Logic with a Probability Semantics: Including Solutions to Some Philosophical Problems, Theodore Hailperin, 2011. 126 pp., $55.00 cloth. ISBN 978-1-61146-010-0. Rowman and Littlefield Publishing Group; www.rlpgbooks.com.

Hailperin's monograph *Logic with a Probability Semantics* advances a formal structure for probability logic by extending it to the field of nondenumerable, sentential events. In the first chapter, the author discusses similarities and differences in the formal language shared by verity logic and probability logic. The discussion then extends to conditional probability logic, for which arguments are presented for establishing sentential validity of conditionals. As in each chapter, solutions to historic philosophical problems are presented. The chapter concludes with an application to the topic of confirming evidence; pieces of evidence (conditional statements) in a real-life murder case were shown to yield a lesser probability of guilt than when taken collectively using logical connectives.

The ensuing chapters develop the foundations of quantifier language for probability logic. By imposing a necessary condition of ontological neutrality for language, the author shows that quantified statements simplify to conjunctions and disjunctions. A final extension adds the suppositional to the language. Borel's work on denumerable probability is discussed to situate infinite aspects of probability. This discussion is needed to define a suitable probability function for quantifier language, thereby offering a resolution to the historic "paradox of confirmation" and thus countering assumptions that infinite occurrences can be treated satisfactorily only by using a Kolmogorov probability space.

Anyone interested in the history and philosophy of logic will find this work intriguing. Amateur logicians will find it challenging but will appreciate the progression toward expressing quantified probability logic in a richer formal structure, thus broadening the book's range of possible applications.

—*Kimberly Gardner*
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Scammed by Statistics: How We Are Lied to, Cheated, and Manipulated by Statistics … and Why You Should Care, Edward Zaccaro and Daniel Zaccaro, 2010. 248 pp., $17.95 paper. ISBN 978-0-9679915-7-3. Hickory Grove Press; www.challengemath.com.
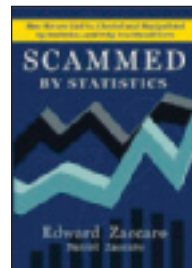
The audience for this book is any teacher, parent, or student who is interested in how statistics are manipulated and used inappropriately. The authors describe the various ways statistics are misused—"purposely fogging clarity," "barely believable graphs," "poor logic"—or are biased by the design of the study. They do so by presenting examples from news media, medical research, consumer studies, politics, and other sources to describe the various ways statistics can be manipulated when presented to the public. The goal is to create discerning interpreters of statistical results.

Scammed by Statistics clearly addresses common misconceptions related to statistics (e.g., confusing correlation and causation; uses of mean, median, and mode; sampling). Well-defined and timely examples clarify how statistics can and should be used to inform decision making. The chapters or their examples would be useful supplements to a statistics course to provide students with real-world examples of the fundamental statistics concepts (e.g., comparison groups, sampling, graphical representations) and could be used to generate conversations about the importance of unbiased study design.

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