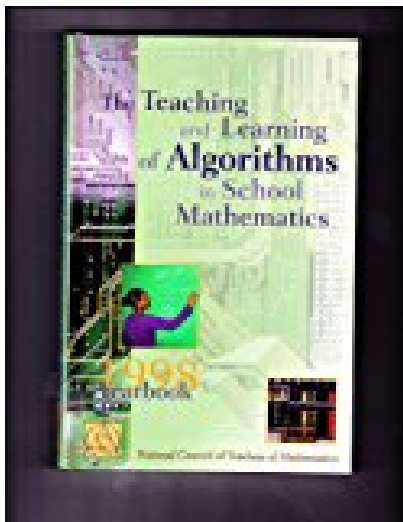


The Teaching and Learning of Algorithms in School Mathematics

1998 Yearbook Yearbook National Council of Teachers of Mathematics



BOOK DETAILS

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BOOK SYNOPSIS

This 1998 yearbook aims to stimulate and answer questions that all educators of mathematics need to consider to adapt school mathematics for the 21st century. The papers included in this book cover a wide variety of topics, including student-invented algorithms, the assessment of such algorithms, algorithms from history and other cultures, ways that algorithms grow and change, and the importance of algorithms in a technological world. Chapters include: (1) "Whither Algorithms? Mathematics Educators Express Their Views" (Lorna J. Morrow); (2) "Paper-and-Pencil Algorithms in a Calculator-and-Computer Age" (Zalman Usiskin); (3) "What Is an Algorithm? What Is an Answer?" (Stephen B. Maurer); (4) "Algorithmic and Recursive Thinking: Current Beliefs and Their Implications for the Future" (Tabitha T.Y. Mingus and Richard M. Grassl); (5) "Teaching Mental Algorithms Constructively" (Alistair McIntosh); (6) "What Criteria for Student-Invented Algorithms?" (Patricia F. Campbell, Thomas E. Rowan, and Anna R. Suarez); (7) "The Importance of Algorithms in Performance-Based Assessments" (Dominic Peressini and Eric Knuth); (8) "A Brief History of Algorithms in Mathematics" (Janet Heine Barnett); (9) "Understanding Algorithms from Their History" (Barnabas Hughes); (10) "An Exploration of the Russian Peasant Method of Multiplication" (Laura Sgroi); (11) "Hammurabis Calculator" (Clifford Wagner); (12) "Capsule Lessons in Alternative Algorithms for the Classroom" (Diane E. Mason); (13) "Historical Algorithms: Sources for Student Projects" (Rheta N. Rubenstein); (14) "Alternative Algorithms for Whole-Number Operations" (William M. Carroll and Denise Porter); (15) "My Family Taught Me This Way" (Pilar Ron); (16) "Calculators in Primary Mathematics: Exploring Number Before Teaching Algorithms" (Susie Groves and Kaye Stacey); (17) "The Harmful Effects of Algorithms in Grades 1-4" (Constance Kamii and Ann Dominick); (18) "A Contextual Investigation of Three-Digit Addition and Subtraction" (Kay McClain, Paul Cobb, and Janet Bowers); (19) "Childrens Invented Algorithms for Multidigit Multiplication Problems" (Jae-Meen Baek); (20) "The Write Way To Mathematical Understanding" (David J. Whitin and Phyllis E. Whitin); (21) "Letting Fraction Algorithms Emerge through Problem Solving" (DeAnn Huinker); (22) "Developing Algorithms for Adding and Subtracting Fractions" (Glenda Lappan and Mary K. Bouck); (23) "A Constructed Algorithm for the Division of Fractions" (Janet Sharp); (24) "Dividing Fractions by Using the Ratio Table" (Jonathan L. Brendefur and Ruth C. Pitingoro); (25) "Teaching Statistics: Whats Average?" (Susan N. Friel); (26) "Algorithms for Solving Nonroutine Mathematical Problems" (Jinfa Cai and Connie Laughlin); (27) "Algebra and Technology" (Ann Bruner, Kathy Coskey, and Sharon K. Sheehan); (28) "A New Look at an Old Algorithm: The Semiaverage Line" (Michael McNamara); (29) "Random-Number Generators: A Mysterious Use of Algorithms" (Stephanie O. Robinson and Donald J. Dessart); (30) "Algorithmic Problem Solving in Discrete Mathematics" (Eric W. Hart); (31) "The Traveling Salesperson: Some Algorithms Are Different" (Lowell Leake); and (32) "Using Algorithms To Generate Objects of Mathematical Interest" (Elaine Simmt). (ASK)

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