*Exploring Abstract Algebra with* Mathematica®. By Allen C. Hibbard and Kenneth M. Levasseur. Springer-Verlag, New York. (1999). 467 pages. $45.00, DM 84.00, öS 614.00, sFr 76.50, GBP 32.50.
Contents:
Preface. I. Group labs. 1. Using symmetry to uncover a group. 2. Determining the symmetry group of a given figure. 3. Is this a group? 4. Let's get these orders straight. 5. Subversively grouping our elements. 6. Cycling through the groups. 7. Permutations. 8. Isomorphisms. 9. Automorphisms. 10. Direct products. 11. Cosets. 12. Normality and factor groups. 13. Group homomorphisms. 14. Rotational groups of regular polyhedra. II. Ring labs. 1. Introduction to rings and **Ringoids**. 2. Introduction to rings, Part 2. 3. An ideal part of rings. 4. What does $\mathbb{Z}[i]/\langle a + bi\rangle$ look like? 5. Ring homomorphisms. 6. Polynomial rings. 7. Factoring and irreducibility. 8. Roots of unity. 9. Cyclotomic polynomials. 10. Quotient rings of polynomials. 11. Quadratic field extensions. 12. Factoring in $\mathbb{Z}[\sqrt{d}]$. 13. Finite fields. III. User's guide. 1. Introduction to **AbstractAlgebra**. 2. **Groupoids**. 3. **Ringoids**. 4. **Morphoids**. 5. Additional functionality. Appendix A. Appendix B. Lab 0 Getting started with Mathematica. Index.

*Multifractals and 1/f Noise: Wild Self-Affinity in Physics (1963–1976)*. By Benoit B. Mandelbrot. Springer-Verlag, New York. (1999). 442 pages. $42.95, DM 89.00, öS 650.00, sFr 81.00, GBP 34.00.
Contents:
Preface. I. Introductions and short pieces. 1. Panorama of grid-bound self-affine variability. 2. Sketches of prehistory and history. 3. Scaling, invariants and fixed points. 4. Filtering and specifications of self-affinity. 5. Short exerpts (1964–1986). II. Unifractal errors and Lévy dusts. 6. New model for error clustering on telephone circuits (Berger and Mandelbrot). Additional tests on clustering. 7. Self-similarity and conditional stationarity. III. Intermittent 1/f noises and conditioned random processes. 8. 1/f noises and the infrared catastrophe. 9. Co-indicator functions and related 1/f noises. 10. Sporadic random functions and conditional spectra self-similar examples and limits. 11. Random sets of multiplicity for trigonometric series. IV. Turbulence and multifractal measures. 12. Sporadic turbulence. 13. Intermittent free turbulence. 14. Lognormal hypothesis and distribution of energy dissipation in intermittent turbulence. 15. Intermittent turbulence in self-similar cascades: Divergence of high moments and dimension of the carrier. 16. Iterated random multiplications and invariance under randomly weighted averaging. 17. "On certain martingales of Benoit Mandelbrot". Guest contribution (Kahane and Peyrière). 18. Intermittent turbulence and fractal dimension: The kurtosis and the spectral exponent $5/3 + B$. 19. Fractal dimension, dispersion, and singularities of fluid motion. Cumulative bibliography. Index.

*Fractals for the Classroom: Strategic Activities, Volume Three*. By Heinz-Otto Peitgen, Hartmut Jürgens, Dietmar Saupe, Evan Maletsky and Terry Perciante. National Council of Teachers of Mathematics/Springer-Verlag, New York. (1999). 107 pages. $24.95, DM 49.00, öS 358.00, sFr 45.50, GBP 19.00.
Contents:
Preface. Authors. Table of contents. Connections to the curriculum. Foreword by Jana Wallace. Unit 7. IFS in two dimensions. Key objectives, notions, and connections. Mathematical background. Using the activities sheets. 1. The Sierpinski Curve. 2. Why the chaos game works. 3. Addressing the Sierpinski gasket and binary numbers. 4. Combinations. 5. Sierpinski's and Pascal's triangle via combinations. 6. Kummer's criterion. 7. Mappings. 8. Copying machine gone wild. 9. The Sierpinski Triangle, Sierpinski Curve, and self-similarity. Unit 8. IFS and geometric genetic codes. Key objectives, notions and connections. Mathematical background. Using the activities sheets. 1. Symmetries. 2. Compositions. 3. Algebraic mappings. 4. Fractal images. 5. Building fractals. 6. Summarizing the process. 7. Chaos game variations. 8. Families of fractals. 9. Originals and relatives. Answers.

*A Concise Course in Algebraic Topology*. By J. P. May. University of Chicago Press, Chicago. (1999). $40.00, GBP 28.00 (cloth); $18.00, GBP 13.00 (paper).
Contents:
Introduction. 1. The fundamental group and some of its applications. 2. Categorical language and the van Kampen theorem. 3. Covering spaces. 4. Graphs. 5. Compactly generated spaces. 6. Cofibrations. 7. Fibrations. 8. Based cofiber and fiber sequences. 9. Higher homotopy groups. 10. CW complexes. 11. The homotopy excision and suspension theorems. 12. A little homological algebra. 13. Axiomatic and cellular homology theory. 14. Derivations of properties from the axioms. 15. The Hurewicz and uniqueness theory. 17. Some more homological algebra. 18. Axiomatic and cellular cohomology theory. 19. Derivations of properties from the axioms. 20. The Poincaré duality theorem. 21. The index of manifolds; manifolds with boundary. 22. Homology, cohomology, and $K(\pi, n)$s. 23. Characteristic classes of vector bundles. 24. An introduction to $K$-theory. 25. An introduction to cobordism. Suggestions for further reading.

*Two- and Three-Dimensional Patterns of the Face*. By Peter W. Hallinan, Gaile G. Gordon, A. L. Yuille. Peter Giblin and David Mumford. A.K. Peters, Natick, MA. (1999). 262 pages. $48.00.
Contents:
Preface. 1. Faces from a pattern-theoretic perspective. 2. Overview of approaches to face recognition. 3. Modeling variations in illumination. 4. Modeling variations in geometry. 5. Recognition from image data. 6. Parabolic curves and ridges on surfaces. 7. Sculpting a surface. 8. Finding facial features from range data. 9. Recognition from range data. 10. What's next? References. Index.