

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 23 (1977)

Rubrik: BULLETIN BIBLIOGRAPHIQUE

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 09.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

BULLETIN BIBLIOGRAPHIQUE

Turbulence and Navier-Stokes equations. — Proceedings of the conference held at the University of Paris-Sud, Orsay, June 12-13, 1975. — Ed. by Roger Teman. — Lecture notes in mathematics, vol. 565. — Un vol. broché, 16,5 × 25, de ix, 194 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1976.

C. Bardos and U. Frisch: Finite-time regularity for bounded and unbounded ideal incompressible fluids using Holder estimates. — *C. Bardos, P. Penel and P. L. Sulem*: Modified dissipativity for a nonlinear evolution equation arising in turbulence. — *C. Foias and R. Temam*: A generic property of the set of stationary solutions of Navier-Stokes equations. — *M. Hénon and Y. Pomeau*: Two strange attractors with a simple structure. — *G. Iooss*: Direct bifurcation of a steady solution of the Navier Stokes equations into an invariant torus. — *D. D. Joseph*: Factorisation theorems for the stability of bifurcating solutions. — *J. P. Kahane*: Mesures et dimensions. — *T. Kato*: Singular perturbation and semigroup theory. — *M. Lesieur et P. L. Sulem*: Les équations spectrales en turbulence homogène et isotrope. Quelques résultats théoriques et numériques. — *B. Mandelbrot*: Intermittent turbulence and fractal dimension kurtosis and the spectral exponent $5/3 + B$. — *D. Ruelle*: The Lorenz attractor and the problem of turbulence. — *D. H. Sattinger*: Pattern formation in convective phenomena. — *V. Scheffer*: Turbulence and Hausdorff dimension. — *B. Temam*: Local existence of \mathcal{C}^∞ solutions of the Euler equations of incompressible perfect fluids.

Séminaire Bourbaki, vol. 1975/1976: exposés 471-488. — Lecture notes in mathematics, vol. 567. — Un vol. broché, 16,5 × 25, de iv, 303 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Pierre Cartier: Les représentations des groupes réductifs p -adiques et leurs caractères. — J. M. Lemaire: Le transfert dans les espaces fibrés (d'après J. Becker et D. Gottlieb). — Joseph Le Potier: Fibrés vectoriels et cycles d'ordre fini sur une variété algébrique non compacte (d'après M. Cornalba et P. Griffiths). — Henry P. McKean et Pierre Van Moerbeke: Sur le spectre de quelques opérateurs et les variétés de Jacobi. — John W. Morgan: The rational homotopy theory of smooth, complex projective varieties (following Deligne, Griffiths, Morgan and Sullivan). — Harold Rosenberg: Les difféomorphismes du cercle (d'après M. R. Herman). — Pierre Deligne: Les difféomorphismes du cercle (d'après M. R. Herman). — Serge Grigorieff: Détermination des jeux boréliens et problèmes logiques associés (d'après D. Martin). — Georges Poitou: Minorations de discriminants (d'après A. M. Odlyzko). — David Ruelle: Formalisme thermodynamique. — John Stallings: Coherence of 3-manifold fundamental groups. — Jacques Tits: Travaux de Margulis sur les sous-groupes discrets de groupes de Lie. — Michel Demazure: Identités de Macdonald. — Daniel Ferrand: Les modules projectifs de type fini sur un anneau

de polynômes sur un corps sont libres (d'après Quillen et Suslin). — André Gramain: Rapport sur la théorie classique des nœuds (1^{re} partie). — Alain Guichardet: Représentation de G^x selon Gelfand et Delorme. — Jean-Pierre Serre: Représentations linéaires des groupes finis « algébriques » (d'après Deligne-Lusztig). — Michel Waldschmidt: Les travaux de G. V. Cudnovskii sur les nombres transcendants.

Robert E. GAINES and Jean L. MAWHIN. — **Coincidence degree and nonlinear differential equations.** — Lecture notes in mathematics, vol. 568. — Un vol. broché, 15,5 × 25, de v, 262 p. — Prix: DM 24,80. — Springer Verlag: Berlin/Heidelberg/New York, 1977.

Introduction. — Alternative problems: an historical perspective. — Coincidence degree for perturbations of Fredholm mappings. — A generalized continuation theorem and existence theorems for $Lx = Nx$. — Two-point boundary value problems: nonlinearities without special structure. — Approximation of solutions: the projection method. — Quasibounded perturbations of Fredholm mappings. — Boundary value problems for some semilinear elliptic partial differential equations. — Periodic solutions of ordinary differential equations with quasibounded nonlinearities and of functional differential equations. — Coincidence index, multiplicity and bifurcation theory. — Coincidence degree for k -set contractive perturbations of linear Fredholm mappings. — Nonlinear perturbations of Fredholm mappings of nonzero index.

Cohomologie étale: séminaire de géométrie algébrique du Bois-Marie SGA 4½. — Par P. Deligne, avec la collab. de J. F. Boutot, A. Grothendieck, L. Illusie et J. L. Verdier. — Lecture notes in mathematics, vol. 569. — Un vol. broché, 16,5 × 25, de v, 312 p. — Prix: DM 31,00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Un fil d'Ariane pour SGA 4, SGA 4½ et SGA 5. — Cohomologie étale: les points de départ (rédigé par J. F. Boutot). — Rapport sur la formule des traces. — Fonctions L modulo l^n et modulo p . — La classe de cohomologie associée à un cycle (par A. Grothendieck rédigé par P. Deligne). — Dualité. — Applications de la formule des traces aux sommes trigonométriques. — Théorèmes de finitude en cohomologie l -adique (avec un appendice par L. Illusie). — Catégories dérivées, état 0 (par J. L. Verdier). — Erratum pour SGA 4.

Differential geometrical methods in mathematical physics. — Proceedings of the symposium held at the University of Bonn, July 1-4, 1975. — Ed. by K. Bleuler and A. Reetz. — Lecture notes in mathematics, vol. 570. — Un vol. broché, 16,5 × 25, de viii, 576 p. — Prix: DM 44,00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Geometric quantization: D. J. Simms: An outline of geometric quantisation (D'après Kostant). R. J. Blattner: The meta-linear geometry of non-real polarizations. J. Sniatycki: On cohomology groups appearing in geometric quantization. K. Gawedzki: Geometric quantization and Feynman path integrals for spin. E. Onofri: V. Fock, 40 years later. J. M. Souriau: Interprétation géométrique des états quantiques. J. Kijowski: Geometric structure of quantization. — *Graded Lie algebras, supersymmetry:* Y. Ne'eman: The application of graded Lie algebras to invariance considerations in particle physics. S. Sternberg: Some recent results on supersymmetry. B. Kostant: Graded manifolds, graded Lie theory, and prequantization. — *Connections, gauge theories:* M. E. Mayer: Gauge fields as quantized connection forms. W. Greub: Complex line bundles and the

magnetic field of a monopole. L. Halpern: Conclusions from an extended gauge principle of Dirac's equation. P. L. Garcia: Reducibility of the symplectic structure of classical fields with gauge symmetry. — *Symplectic structures, mechanics*: A. Lichnerowicz: New geometrical dynamics. P. Dedecker: On the generalization of symplectic geometry to multiple integrals in the calculus of variations. W. M. Tulczyjew: A symplectic formulation of particle dynamics. A symplectic formulation of field dynamics. M. Moshinsky: Canonical transformations and their representations in quantum mechanics. — *Riemannian spaces, general relativity*: W. Szczyrba: On a symplectic structure of general relativity. M. Francaviglia: On the symplectic formulation of the Einstein system of evolution in presence of a self gravitating scalar field. R. Debever: Invertible foliations and type D-spaces. R. Kerner: Deformation of the embedded Einstein spaces. H. J. Seifert: The causal structure of singularities. C. DeWitt-Morette: Towards quantum gravity. P. Jordan: About Dirac's idea of cosmologically variable "constants" of nature.

Sparse matrix techniques, Copenhagen 1976. — Advanced course held at the Technical university of Denmark, Copenhagen, August 9-12, 1976. — Ed. by V. A. Barker. — Lecture notes in mathematics, vol. 572. — Un vol. broché, 16,5 × 25, de v, 184 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Owe Axelsson: Solution of linear systems of equations: iterative methods. — J. Alan George: Solution of linear systems of equations: direct methods for finite element problems. — John K. Reid: Solution of linear systems of equations: direct methods (general). — Axel Ruhe: Computation of eigenvalues and eigenvectors.

L. E. SIGLER. — **Algebra.** — Undergraduate texts in mathematics. — Un vol. relié, 16,5 × 24, de xi, 419 p. — Prix: DM 36.20. — Springer Verlag, Berlin/Heidelberg/New York, 1976.

Set theory : Sets. Operations on sets. Relations. Quotient sets. Functions. Composition of functions. A factorization of a function. The symmetric group. — *Rings : basic theory* : Binary operations. The ring. Special rings. Subrings. Morphisms. Quotient rings. Morphisms and quotient rings. Ideals. — *Rings : natural numbers and integers* : The Peano axioms. Addition of natural numbers. Multiplication of natural numbers. Further properties of N . Construction of the integers. Embedding N in the integers. Ordered integral domains. A characterization of the integers. — *Rings : Applications of the integers* : Finite sets. Generalized associative, commutative, and distributive theorems. The division algorithm for the integers. Multiples and exponents in a ring. The field of fractions. Characteristic of a ring. — *Rings : polynomials and factorization* : The ring of polynomials. A formal definition of a polynomial ring. Polynomial functions. Euclidean and principal ideal domains. Factorization in principal ideal domains. Greatest common divisor. Unique factorization domains. Field extensions and complex numbers. — *Linear algebra : modules* : Function spaces, modules, and vector spaces. Submodules. Quotient modules. Morphisms. Products and direct sums. Families and matrices. Bases. The coordinate morphism. Morphisms and bases, kernel and range. Vector spaces. Appendices. — *Linear algebra : the module of morphisms* : $\mathcal{L}(M, M')$, the module of morphisms. Composition of morphisms, the endomorphism algebra $\mathcal{E}(M)$. Matrix calculation of morphisms. Change of basis. The dual space. Linear equations. Determinants. — *Abstract systems* : Algebraic systems. Algebraic subsystems. Morphisms. Congruences and quotient systems. Products and sums. — *Monoids and groups* : Monoids, unitary monoids, cancellative monoids, and groups. Congruences and quotient systems. Morphisms. Cyclic groups and order.

Products. — *Linear algebra : Modules over principal domains and similarity* : Cyclic modules Invariant factors. Linear equations in a principal domain. A direct sum resolution of a finitely generated module. Similarity and canonical forms. The characteristic polynomial and characteristic values.

J. Donald MONK. — **Mathematical logic.** — Graduate texts in mathematics, vol. 37. — Un vol. relié, 16,5 × 24, de x, 531 p. — Prix: DM 48.40. — Springer Verlag, New York/Heidelberg/Berlin, 1976.

Recursive function theory : Turing machines. Elementary recursive and primitive recursive functions. Recursive functions; Turing computability. Markov algorithms. Recursion theory. Recursively enumerable sets. Survey of recursion theory. — *Elements of logic* : Sentential logic. Boolean algebra. Syntactics of first-order languages. Some basic results of first-order logic. Cylindrical algebras. — *Decidable and undecidable theories* : Some decidable theories. Implicit definability in number theories. General theory of undecidability. Some undecidable theories. Unprovability of consistency. — *Model theory* : Construction of models. Elementary equivalence. Nonstandard mathematics. Complete theories. The interpolation theorem. Generalized products. Equational logic. Preservation and characterization theorem. Elementary classes and elementary equivalence. Types. Saturated structures. — *Unusual logics* : Inessential variations. Finitary extensions. Infinitary extensions.

Arno LANGENBACH. — **Monotone Potentialoperatoren.** — Hochschultext. — Un vol. broché, 16,5 × 25, de 358 p. — Prix: DM 54.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Gleichungen in abstrakten Räumen : Einführung. Lineare Funktionale und reflexive Räume. Minimum-Probleme und Gleichungen mit Potentialoperatoren. Minimum-Probleme für konvexe Funktionale. Gleichungen mit kontraktiven Operatoren. Kommentare. — *Einige Gleichungen aus der mathematischen Theorie der deformierbaren Festkörper* : Die Gundgleichungen. Das elastische Gleichgewicht dünner Platten. Ebene Probleme der elastisch-plastischen Deformationstheorie. Probleme der elastisch-plastischen Fließtheorie. Elastisch-idealplastische Körper. Kommentare. — *Konkretisierung und Lösung von Operatorgleichungen und Minimum-Problemen* : Gleichungen in Funktionenräumen. Gleichungen mit Lipschitz-stetigen stark monotonen Operatoren im Hilbertraum. Gleichungen in Funktionenräumen über unbeschränkten Gebieten. Minimum-Probleme für stark wachsende Funktionale und Operatorgleichungen in Sobolev-Orlicz-Räumen. Kommentare. — *Parameterabhängige Gleichungen* : Implizite Operatorfunktionen. Gleichungen mit vollstetigen Potentialoperatoren. Trajektorien einer parameterabhängigen Operatorgleichung. Isoperimetrische Extremalaufgaben. Operator-Differentialgleichungen. Kommentare. — *Approximation durch Folgen monotoner Operatoren und konvexer Funkitonale* : Iterations- und Projektionsverfahren. Die Konstruktion von Minimalfolgen. Modelle mit Nebenbedingungen. Kommentare.

I. M. SINGER and J. A. THORPE. — **Lecture notes on elementary topology and geometry.** — Reprint of the 1967 ed. published by Scott, Foresman. — Undergraduate texts in mathematics. — Un vol. relié, 16,5 × 24, de viii, 232 p. — Prix: DM 33.60. — Springer Verlag, New York/Heidelberg/Berlin, 1976.

Some point set topology : Naive set theory. Topological spaces. Connected and compact spaces. Continuous functions. Product spaces. The Tychonoff theorem. — *More point*

set topology : Separation axioms. Separation by continuous functions. More separability. Complete metric spaces. Applications. — *Fundamental group and covering spaces* : Homotopy. Fundamental group. Covering spaces. — *Simplicial complexes* : Geometry of simplicial complexes. Barycentric subdivisions. Simplicial approximation theorem. Fundamental group of a simplicial complex. — *Manifolds* : Differentiable manifolds. Differential forms. Miscellaneous facts. — *Homology theory and the De Rham theory* : Simplicial homology. De Rham's theorem. — *Intrinsic Riemannian geometry of surfaces* : Parallel translation and connections. Structural equations and curvature. Interpretation of curvature. Geodesic coordinate systems. Isometries and spaces of constant curvature. — *Imbedded manifolds in R^3* .

Differential equations. — Colloquium on differential equations held at Keszthely (Hungary) in 1974. — Ed. by M. Farkas. — Colloquia mathematica societatis Janos Bolyai, vol. 15. — Un vol. relié, 18 × 24,5, de 418 p. — Prix: DFL 125.00. — North Holland Publishing Company, Amsterdam/Oxford/New York, 1977.

33 exposés par: A. A. Abramov, E. S. Birger, N. B. Konyukhova et V. I. Ulyanova; Yu. A. Arkhangelskii; D. D. Bainov et M. M. Konstantinov; D. D. Bainov et S. D. Milusheva; I. Bartsch; E. M. Bruins; T. A. Canturia; M. L. Cartwright et H. P. F. Swinnerton-Dyer; K. Deimling; I. F. Dorofeev; S. Fucik; J. Gergely; D. Greenspan; D. Greenspan et D. Schultz; L. J. Grimm et L. M. Hall; P. S. Gromova; L. V. Gusco; I. Gyori; L. Hatvani et A. Kramli; J. Hegedus; G. Jank; J. Jarnik et J. Kurzweil; E. Kozakiewicz; P. Marusiak; B. Mehri; S. B. Norkin; L. Pintér; L. E. Reizin's; A. Schmidt; J. Terjéki; M. Tvrdy; Ju. A. Ved'; J. Walter.

J. A. SHERCLIFF. — **Vector fields**: vector analysis developed through its application to engineering and physics. — Un vol. broché, 15,5 × 23, de xi, 329 p. — Prix: £4.25. — Cambridge University Press, London/New York/Melbourne, 1977.

Preface. — Vector algebra revisited. — Vector algebra applied to electromagnetism. — Line and surface integrals. — Further applications to electromagnetism. — Volume integrals. — A crisis in electromagnetic theory. — Gradient and divergence, gauges of non-uniformity. — Gradient and divergence combined. — Four other important partial differential equations. — Rotationality and the curl operator in fluid mechanics. — The curl operator in electromagnetism. — Integrals in fluid mechanics. — *Appendix 1*: A note on differentials, Taylor's theorem and mathematical modelling. — *Appendix 2* : Suggested lecture demonstration and coursework tasks.

Computing methods in applied sciences and engineering. — Second international symposium, December 15-19, 1975, IRIA LABORIA Institut de recherche d'informatique et d'automatique. — Ed. by R. Glowinski and J. L. Lions. — Lecture notes in economics and mathematical systems, vol. 134. — Un vol. broché, 16,5 × 24, de viii, 390 p. — Prix: DM 37.00. — Springer Verlag, Berlin/Heidelberg/New York, 1976.

Algèbre numérique : 5 exposés par Alan George; K. A. Braun, G. Dietrich, G. Frik, Th. L. Johnson, K. Straub et G. Vallianos; Y. A. Kuznetsov; Paul Concus et Gene H. Golub; V. A. Vasilenko. — *Eléments finis* : 4 exposés par F. Brezzi; M. Bernadou et P. G. Ciarlet; Ivo Babuska; Joachim Nitsche. — *Problèmes dynamiques* : 4 exposés par Hiroshi Fujita; G. J. Marchouk et V. V. Shaydourov; Michel Crouzeix; P. Lesaint. —

Problèmes d'identification et problèmes inverses: 6 exposés par Jean Cea; J. M. Boisserie et R. Glowinski; R. Glowinski et O. Pironneau; Masaya Yamaguti; J. Galligani; Todd Dupont et H. H. Rachford; Jr. — *Méthodes intégrales*: 3 exposés par J. C. Lachat et J. O. Watson; T. S. Luu; J. C. Nedelec.

Roger WETS. — **Grundlagen konvexer Optimierung.** — Lecture notes in economics and mathematical systems, vol. 137. — Un vol. broché, 16,5 × 24, de vi, 146 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1976.

Konvexe Mengen und konvexe Funktionen. — Stetigkeit. — Trennungssätze. — Konjugierte Funktionen. — Darstellungssätze. — Alternativsätze. Anwendungen. — Differenzierbarkeit. — Projektionen und Schnitte konvexer Mengen, Funktionen und Subdifferentiale. — Die Minimierung (Konvexer) Funktionale. — Dualitätstheorie für konvexe Programmierungsprobleme. — Algorithmen für konvexe Programmierungsaufgaben. — Anmerkungen und Erweiterungen.

Mathematical economics and game theory. — Essays in honor of Oskar Morgenstern. — Ed. by R. Henn and O. Moeschlin. — Lecture notes in economics and mathematical systems, vol. 141. — Un volume broché, 16,5 × 24, de xiv, 709 p. — Prix: DM 51.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

R. Henn and O. Moeschlin: The scientific work of Oskar Morgenstern. — Part 1: *Game theory*: C. Berge: Vers une théorie générale des jeux positionnels. D. Bierlein: Erweiterte Sattelpunkt — kriterium und ϵ -Rand-Spiel. W. A. Brock: Differential games with active and passive variables. E. Kofler and G. Menges: Stochastic linearisation of indeterminateness. W. F. Lucas: The existence problem for solutions. G. Owen: Values of games with a priori unions. W. Richter: Core, Lindahl equilibria and revelation of preferences. J. Rosenmüller: Remark on the transfer operator and the value-equilibrium equivalence hypothesis. W. Rupp: ϵ -Gleichgewichtspunkte in n -Personenspielen. R. Selten: A simple game model of kidnapping. I. Ståhl: An n -person bargaining game in the extensive form. L. G. Telser: An extreme application of core theory. E. Vilkas: Optimality and dynamics in coalitional games. — Part 2: *Utility theory and related topics*: P.C. Fishburn: Expected utility theories: a review note. H. Föllmer: The Bernoulli principle and the Dirichlet problem. S. Fuchs-Seliger: Bemerkungen zur Widerpruchsfreiheit der Axiome in der Theorie der revealed preference. W. Krelle: Dynamic utility functions. A. Wieczorek: On representations of social preferences, an algebraic approach. — E. W. Zachow und N. Schmitz: Eine Axiomatisierung des erwarteten Nutzens. — Part 3: *Economic models*: D. Fischer: Externalities and interdependence in a von Neumann growth model. — G. Gabisch: International trade and game theory in a context of economic growth. V. L. Makarov: Economic equilibrium under technological changes. D. Pallaschke: Infinite-dimensional von Neumann models. I. Sohn: Some variations on the Mardón model. — Part 4: *Economic theory*: Y. Amihud: On the consumer demand theory under uncertainty. K. Ballarini und P. Kischka: Anwendung eines verallgemeinerten Periodizitätsbegriffes in makroökonomischen Modellen. M. J. Beckmann: A paradox in consumption theory. G. Bol: An application of the theorem of Whitney in joint production theory. W. Eichhorn, H. Funke und F. Stehling: Spieltheoretische Behandlung der Preisbildung vor und nach Unternehmenszusammenschlüssen. W. Roedding: A new approach to modelling some economic problems. A. Schotter: Economically efficient and politically sustainable economic contraction. F. R. Shupp: Dynamic limit pricing in a mature market. C. Tisdell: Coalitions and clubs: aspects of their formation and

economic efficiency. — *Part 5 : Econometrics and statistics* : S. P. Burley: An econometric study of copper market dynamics. B. H. Goldstein und H. Kogelschatz: Bemerkung zur Abschätzung des Wertes bei Stop-Problemen. H. Hauptmann: On the identifiability of continuous time economic models. C. Hild: Eine Bemerkung zur Anwendung der MINIQUE-Methode. E. P. Howrey: The use of preliminary data in economic time-series prediction. M. Straub: Minimaxschätzungen bei Vorbewertung. G. Tintner and A. Sondermann: Statistical aspects of economic aggregation. H. Wold: On the transition from pattern cognition to model building. — *Part 6 : Different topics* : 6 exposés par: S. W. Becker et R. L. Weil — S. J. Brams — H. Brems — O. Hagen — A. Jaeger — M. Suzuki and M. Nakayama. — Addenda. — A bibliography of the work of Oskar Morgenstern.

Charles DELORME, Christine LAVIT, Alain MEZARD et Jean-Claude RAOULT. — **Solutions développées des exercices (du traité « Algèbre » par S. MacLane et G. Birkhoff).** — 3^e partie: Les grands théorèmes. — Un vol. broché, 15,5 × 25, de 184 p. — Gauthier-Villars, Paris (en Suisse: Diffusion SPES, Lausanne), 1976.

Similitude des matrices et groupes abéliens finis: Modules noethériens. Modules cycliques. Modules de torsion. Forme canonique rationnelle des matrices. Modules primaires. Modules libres. Equivalence des matrices. Calcul des facteurs invariants. Modules projectifs et injectifs. Théorème de la base de Hilbert. Anneaux factoriels. — *Structures des groupes*: Théorème d'isomorphisme. Extensions de groupes. Sous-groupes caractéristiques. Classes de conjugués. Théorèmes de Sylow. Groupes nilpotents. Groupes résolubles. Théorème de Jordan-Hölder. Simplicité de A_n . *Algèbre multilinéaire*: Produits tensoriels itérés. Espaces de tenseurs. Modules gradués. Algèbres graduées. Algèbre tensorielle graduée. Algèbre extérieure d'un module. Déterminants et algèbre extérieure. Sous-espaces et algèbre extérieure. Dualité dans l'algèbre extérieure. — *Théorie de Galois*: Extensions algébriques et transcendantes. Adjonctions de racines. Degrés et extensions finies. Extensions algébriquement itérées. Corps des racines d'une équation algébrique. Le groupe de Galois. Extensions séparables et inséparables. Propriétés du groupe de Galois. Sous-groupes et sous-corps. Corps finis. Insolubilité des équations du cinquième degré.

A. U. KUSSMAUL. — **Stochastic integration and generalized martingales**. — Research notes in mathematics, vol. 11. — Un vol. broché, 17 × 25, de 163 p. — Prix: £7.00. — Pitman Publishing, London/San Francisco/Melbourne, 1977.

Preliminaries: Notation and basic definitions. Integration with respect to stochastic processes of bounded variation. Adapted processes and stopping times. — *Generalised martingales and general theory of processes*: Discrete martingales. Continuous parameter martingales. Classification of stopping times. Basic sub σ -algebras of $\Sigma = B \otimes F$ and projections of stochastic processes. Processes of bounded variation and projections. Quasimartingales. — *Stochastic integration*: Integration with respect to measures with values in a Banach space. Stochastic integration with respect to square integrable martingales and martingales of bounded variation. Locally summable and summable stochastic processes. Decomposition of the space SM of summable martingales and representation of martingales as stochastic integrals.

A. O STROWSKI. — **Aufgabensammlung zur Infinitesimalrechnung. Band 3:** Integralrechnung auf dem Gebiete mehrerer Variablen. — Mathematische Reihe, Band 56. — Un vol. relié, 18 × 25, de 398 p. — Prix: SF 68.00. — Birkhäuser Verlag, Basel/Stuttgart, 1977.

Komplexe Zahlen. — Integration rationaler Funktionen. Partialbruchzerlegung. — Integration irrationaler Ausdrücke. — Integration transzendenter Funktionen. — Flächenintegrale über aschsenparallele Rechtecke. — Einfache Integrale von integrierbaren Funktionen. — Flächenintegrale über quadrierbare Gebiete. — Linienintegrale. — Anwendungen der Linienintegrale. Totale Differentiale. — Variablensubstitution in Flächenintegralen. — Oberfläche und Oberflächenintegrale. — Weitere Anwendungen mehrfacher Integrale. — Einfache uneigentliche Integrale. — Grenzübergang unter dem Integralzeichen. — Berechnung spezieller bestimmter Integrale. — Mehrfache uneigentliche Integrale. — Die Gammafunktion. — Fourier-Reihen. — Ergänzungen und Anwendungen zur Theorie der Fourier-Reihen. — Fourier-Integrale.

J. R. HIGGINS. — **Completeness and basis properties of sets of special functions.** — Cambridge tracts in mathematics, vol. 72. — Un vol. relié, 14,5 × 22, de x, 134 p. — Prix: £9.80. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Foundations : Notes on metric spaces. Notes on the L^p spaces. Orthogonal sequences in Hilbert space. Biorthogonal systems in Hilbert space. — *Orthogonal sequences* : Complete sequences of polynomials. The Vitali completeness criterion. The Dalzell completeness criterion. The functions of Rademacher, Walsh and Haar. CON sequences and the reproducing kernel. The method of isometric transformation. CON sequences of complex functions. — *Non-orthogonal sequences* : The stability of bases. A complex variable method. Non-orthogonal Fourier-Bessel and Legendre functions. Some theorems of Müntz and Szasz. — *Differential and integral operators* : Sturm-Liouville systems. Singular boundary value problems. Integral operators. — *Appendix 1* : Supplementary theorems. — *Appendix 2* : Definitions of special functions. — *Appendix 3* : Some complete sequences of special functions.

Martin DAVIS. — **Applied nonstandard analysis.** — Pure and applied mathematics, a Wiley-Interscience series of texts, monographs and tracts. — Un vol. relié, 16 × 24, de xi, 181 p. — Prix: £12.70. — John Wiley and Sons, New York/London/Sydney/Toronto, 1977.

Introduction : Why nonstandard analysis ? Infinitesimals as ideal elements. The role of logic. Three techniques. Mathematical logic and rigor. Numbering of theorems. — *Universes and languages* : Sets and relations. Filters. Individuals and superstructures. Universes. Languages. Semantics. Łos' theorem. Concurrence, infinite integers, internal sets. Recapitulation. Exercises. — *Real numbers and hyperreal numbers* : Ordered fields. Nonstandard theory of Archimedean fields. The real numbers. The hyperreal numbers. Real sequences and functions. Prolongation theorems. Nonstandard differential calculus. Additivity. The existence of nonmeasurable sets. Exercises. — *Topological and metric spaces* : Topological spaces. Mappings and products. Topological groups. The existence of Haar measure. Metric spaces. Uniform convergence. Uniform continuity and equicontinuity. Compact mappings. — *Normed linear spaces* : Linear spaces. Compact operators. Integration of Banach space valued functions. Differential calculus. — *Hilbert space* : Unitary spaces. Orthogonal projections. The Bernstein-Robinson theorem. The spectral theorem for compact Hermitian operators. Noncompact Hermitian operators.

Jacqueline LELONG-FERRAND et Jean-Marie ARNAUDIES. — **Cours de mathématiques, tome 4:** Equations différentielles, intégrales multiples, fonctions holomorphes. — 2^e éd.

corrigée. — Un vol. relié, 16 × 25, de ix, 454 p. — Paris: Dunod (en Suisse: Diffusion SPES, Lausanne), 1977.

Equations différentielles. Généralités, cas linéaire: Systèmes différentiels. Forme normale. Equations différentielles vectorielles: problème de Cauchy. Equations différentielles linéaires. Généralités. Théorème de Cauchy (cas des équations linéaires). Equations différentielles scalaires linéaires du premier ordre. Etude directe. Equations et systèmes homogènes. Méthode de variation des constantes. Equations différentielles linéaires du second ordre. Equations scalaires d'ordre quelconque. Intégration par développement en série. Equations du type de Fuchs. — *Equations différentielles linéaires à coefficients constants*: Principes généraux. Cas où E est de dimension finie. Exemples de systèmes homogènes. Systèmes non homogènes. Utilisation d'un changement de base. Cas d'une équation scalaire d'ordre n à coefficients constants. Equations d'Euler. Calcul symbolique. — *Equations différentielles non linéaires. Exemples et applications*: Théorème de Cauchy-Lipschitz. Résultats pratiques. Cas d'une équation non résolue par rapport aux dérivées Cas élémentaires. Etude locale. Equations de la forme $y'' = f(y)$. Equations de Bernoulli et de Riccati. Courbes intégrales. Point de vue géométrique. Equations de la forme $f(x, y') = 0$ ou $f(y, y') = 0$. Equations homogènes. Equations de Lagrange et de Clairaut. Trajectoires d'un champ de vecteurs. Exemples de trajectoires. Trajectoires orthogonales. — *Intégrales multiples. Définitions. Propriétés générales*: Fonctions en escalier sur un pavé de \mathbf{R}^n . Intégrale des fonctions en escalier. Intégration sur un pavé. Intégration sur un ensemble borné. Conditions d'intégrabilité. Propriétés de l'intégrale. Ensembles quarrables. Mesure. Propriétés de la mesure. Sommes de Riemann. Sommes de Darboux. — *Calcul des intégrales multiples*: Intégration sur un produit de pavés. Applications. Calcul des intégrales doubles. Intégrales triples. Calcul des volumes. Changement de variables. Exemples de changement de variables. Quelques exemples de calcul d'aires et de volumes. Aire des surfaces. Intégrales généralisées. Un exemple d'intégrale généralisée; comparaison avec une série double. Exemples d'intégrales généralisées sur des ensembles bornés. Intégrales multiples dépendant d'un paramètre. — *Formes différentielles. Intégrales curvilignes. Intégrales de surface*: Formes différentielles de degré un. Intégrales curvilignes. Formule de Riemann-Green. Application: Formule du changement de variables pour les intégrales doubles. Eléments d'algèbre extérieure. Formes différentielles de degré p . Intégration des formes différentielles. Intégrales de surface: interprétation géométrique. Formule d'Ostrogradski. Formule de Stokes. Le problème des primitives. — *Masses, centres et moments d'inertie des systèmes matériels*: Notion de mesure positive sur un compact. Système matériels. Masses. Centres de gravité (ou d'inertie). Propriétés des centres d'inertie. Théorèmes de Guldin. Moments d'inertie. Relations entre les moments d'inertie. Tenseurs et matrices d'inertie. — *Fonctions holomorphes; calcul des résidus*: Définitions. Exemples. Différentiabilité. Formules de Cauchy. Première formule de Cauchy. Propriétés des intégrales curvilignes de fonctions complexes. Théorème d'Alembert. Deuxième formule de Cauchy. Développement en série entière. Analyticité des fonctions holomorphes. Résidus. La formule des résidus. Calcul d'intégrales par la méthode des résidus. Autres exemples. Exemples d'intégrales de fonctions non uniformes.

Harro HEUSER. — *Funktionalanalysis*. — Mathematische Leitfaden. — Un vol. broché, 16 × 23, de 416 p. — Prix: DM 58.00. — Stuttgart, B. G. Teubner, 1975.

Der Banachsche Fixpunktsatz: Metrische Räume. Der Banachsche Fixpunktsatz. Einige Anwendungen des Banachschen Fixpunktsatzes. — *Normierte Räume*: Vektorräume. Lineare Abbildungen. Normierte Räume. Stetige lineare Abbildungen. Die Neumannsche Reihe. Normierte Algebren. Endlichdimensionale normierte Räume. Die Neumannsche Reihe in unvollständigen normierten Räumen. Die Vervollständigung metri-

scher und normierter Räume. Kompakte Operatoren. — *Bilinearssysteme und konjugierte Operatoren*: Bilinearssysteme. Dualsysteme. Konjugierte Operatoren. Die Gleichung ($I-K$) $X = y$ mit endlichdimensionalem K . Die Gleichung ($R-S$) $x = y$ mit bijektivem R und endlichdimensionalem S . Die Fredholmsche Integralgleichung mit stetigem Kern. Quotientenräume. Die Quotientennorm. Quotientenalgebren. — *Fredholmoperatoren*: Defektendliche Operatoren. Fredholmoperatoren auf normierten Räumen. Fredholmoperatoren on saturierten Operatorenalgebren. Darstellungssätze für Fredholmoperatoren. Die Gleichung $Ax = y$ mit einem Fredholmoperator A . — *Vier Prinzipien der Funktionalanalysis und einige Anwendungen*: Das Fortsetzungsprinzip von Hahn-Banach. Normale Auflösbarkeit. Die normale Auflösbarkeit der Operatoren $I-K$ mit kompaktem K . Das Bairesche Kategorienprinzip. Das Prinzip der offenen Abbildung und der Graphensatz. Das Prinzip der gleichmässigen Beschränktheit. Einige analytische Anwendungen der funktionalanalytischen Prinzipien. Analytische Darstellung stetiger Linearformen. Operatoren mit abgeschlossenem Bildraum. Fredholmoperatoren auf Banachräumen. — *Die Riesz-Schaudersche Theorie kompakter Operatoren*: Kettenendliche Endomorphismen. Kettenendliche Fredholmoperatoren. Die Riezsche Theorie kompakter Operatoren. Der Bidual eines normierten Raumes. Reflexivität. Die duale Transformation eines kompakten Operators. Singuläre Werte und Eigenwerte eines kompakten Operators. — *Spektraltheorie in Banachräumen und Banachalgebren*: Die Resolvente. Das Spektrum. Vektorwertige holomorphe Funktionen. Schwache Konvergenz. Potenzreihen in Banachalgebren. Der Funktionalkalkül. Spektralprojektoren. Isolierte Punkte des Spektrums. Der Fredholmbereich. Rieszoperatoren. Wesentliche Spektren. Normaloide Operatoren. — *Approximationsprobleme in normierten Räumen*: Ein Approximationsproblem: Strikt konvexe Räume. Innenprodukträume. Orthogonalität. Die Gaussapproximation. Das allgemeine Approximationsproblem. Approximationen in gleichmässig konvexen Räumen. Approximation in reflexiven Räumen. — *Orthogonalzerlegungen in Hilberträumen*: Orthogonale Komplemente. Orthogonalreihen. Orthogonalbasen. Der Dual eines Hilbertraumes. Die adjungierte Transformation. — *Spektraltheorie in Hilberträumen*: Symmetrische Operatoren. Orthogonalprojektoren. Normale Operatoren und ihre Spektren. Normale meromorphe Operatoren. Symmetrische kompakte Operatoren. Das Sturm-Liouillesche Eigenwertproblem. Wielandtoperatoren. Bestimmung und Abschätzung von Eigenwerten. Allgemeine Eigenwertprobleme für Differentialoperatoren. Vorbemerkungen zu dem Spektralsatz für symmetrische Operatoren. Funktionalkalkül für symmetrische Operatoren. Der Spektralsatz für symmetrische Operatoren auf Hilberträumen. — *Topologische Vektorräume*: Metrische Vektorräume. Topologische Grundbegriffe. Die schwache Topologie. Begriff des topologischen Vektorraumes. Beispiele. Die Nullumgebungen in topologischen Vektorräumen. Die Erzeugung von Vektorraumtopologien. Unter-, Produkt- und Quotientenräume Stetige lineare Abbildungen topologischer Vektorräume. Endlichdimensionale topologische Vektorräume. Fredholmoperatoren auf topologischen Vektorräumen. — *Lokalkonvexe Vektorräume*: Nullumgebungsbasisen lokalkonvexer Vektorräume. Die Erzeugung lokalkonvexer Topologien durch Halbnormen. Unter-, Produkt- und Quotientenräume lokalkonvexer Räume. Normierbare lokalkonvexe Räume. Beschränkte Mengen. — *Dualität und Kompaktheit*: Der Satz von Hahn-Banach. Die topologische Charakterisierung der normalen Auflösbarkeit. Trennungssätze. Drei Anwendungen auf normierte Räume. Zulässige Topologien. Der Bipolaresatz. Lokalkonvexe Topologien sind σ -Topologien. Kompakte Mengen. Der Satz von Alaoglu-Bourbaki. Die Charakterisierung der zulässigen Topologien. Beschränkte Mengen in zulässigen Topologien. Tonnelierte Räume. Reflexivität. Konvexe, kompakte Mengen: die Sätze von Krein-Milman und Schauder. — *Die Darstellung kommutativer Banachalgebren*: Vorbemerkungen zum Darstellungsproblem. Multiplikative Linearformen und maximale Ideale. Der Gelfandsche Darstellungssatz. Die Darstellung kommutativer B^* -Algebren.

Vasant S. HUZURBAZAR. — **Sufficient statistics: selected contributions.** — Ed. by Anant M. Kshirsagar. — Statistics: textbooks and monographs, vol. 19. — Un vol. relié, 16 × 24, de XIII, 270 p. — Prix: SF 92.00. — Marcel Dekker, Inc., New York/Basel, 1976.

Invariance theory of prior probabilities: Bayes' theorem and inverse probability. Distributions admitting sufficient statistics. Invariance theory of Jeffreys. Some properties of Jeffreys' invariants. Invariants of distributions admitting sufficient statistics: 1. One parameter. 2. Several parameters. 3. The range depending on the parameter. 4. An alternative system of invariants. — *The general forms of distributions admitting sufficient statistics for parameters in nonregular cases*: Introduction. Definitions, notation, and preliminary results. The nonregular case with a single sufficient statistic for a single unknown parameter. Derivation of the general form of section 3.10, assuming the general form of equation (2-3) $f(x; \theta) = \exp [u(\theta)v(x) + A(x) + B(\theta)]$, when $a \leq x \leq b$, for the regular case. The nonregular case with a single parameter admitting a minimal set of jointly sufficient statistics. Derivation of the general forms of Section 5, assuming the general form of equation (2-4) when $a \leq x \leq b$, for the regular case. The nonregular case with two parameters. The nonregular case involving more than two parameters. — *Location and scale parameters, and sufficient statistics*: Definitions, notation, and preliminary results. Location parameter. Scale parameter. Distributions depending on both location and scale parameters. Location-parameter families of distributions of the regular type admitting a single sufficient statistic for the location parameter. Scale-parameter families of distributions of the regular type admitting a single sufficient statistic for the scale parameter. The normal family of distributions as the only location scale-parameter family of distributions of the regular type admitting a minimal pair of jointly sufficient statistics for the parameters of location and scale. Location-parameter families of distributions of the nonregular type admitting a single sufficient statistic for the location parameter. Scale-parameter families of distributions of the nonregular type admitting a single sufficient statistic for the scale parameter. The rectangular and the exponential families of distributions as the only location scale-parameter families of distributions of the nonregular type admitting a minimal pair of jointly sufficient statistics for the parameters of location and scale.

Jagdish K. PATEL: C. H. KAPADIA and D. B. OWEN. — **Handbook of statistical distributions.** — Statistics: textbooks and monographs, vol. 20. — Un vol. relié, 16 × 24, de XIV, 302 p. — Prix: SF 65.00. — Marcel Dekker, Inc., New York/Basel, 1976.

Moments, cumulants, and generating functions: Moments and cumulants. Generating functions. More on characteristic functions. Moments, cumulants, and generating functions for some useful discrete distributions. Moments, cumulants, and generating functions for some useful continuous distributions. — *Inequalities*: Moment inequalities. Chebyshev inequalities. — *Order statistics*: Definition. Distribution of order statistics. Some useful results. Moments of order statistics from some discrete distributions. Moments of order statistics from some continuous distributions. — *Families of distributions*: Pearson (continuous) distributions. Exponential family of distributions. Linear exponential type (continuous) distributions (a subclass of the exponential family). Pólya type (continuous) distributions. Monotone likelihood ratio distributions. Generalized power series (discrete) distributions (GPSD). Monotone failure rate (continuous) distributions. New better (worse) than used (continuous) distributions. Stable (continuous) distributions. Infinitely divisible distributions (IDD). Unimodal distributions. Classification of some useful discrete distributions. Classification of some continuous distributions. — *Characterization*

of distributions: General characterizations. Characterization of some useful discrete distributions. Characterization of some useful continuous distributions. — *Point estimation*. Introduction. Methods of finding estimators. Sufficient statistics. Complete families and complete statistics. Uniformly minimum-variance unbiased estimator (UMVUE). Complete sufficient statistics and UMVUE's (discrete). Complete sufficient statistics and UMVUE's (continuous). — *Confidence intervals*: Introduction. Confidence intervals for some useful discrete distributions. Confidence intervals for some continuous distributions. — *Properties of distributions*: Discrete distributions. Continuous distributions. — *Basic limit theorems*: Types of convergence. Laws of large numbers. The central limit theorem. Some other limit theorems. *Miscellaneous results*: Gamma functions. Incomplete gamma functions. Beta functions. Incomplete beta functions. Convex (concave) functions. Transformation of statistics. Stirling numbers. Bernoulli numbers. Hyper-geometric functions. The notations O and o . K -statistics. Some useful combinatorials. Some useful series. Some well-known inequalities.

P. M. COHN. — **Skew field constructions**. — London mathematical society lecture note series, vol. 27. — Un vol. broché, 16 × 23, de XII, 253 p. — Prix: £7.50. — Cambridge University Press, Cambridge/London/New Yor/Melbourne, 1977.

Skew polynomial rings and their fields of fractions: The general embedding problem. Ore's method. Skew polynomial rings. — *Topological methods*: Power series rings. Inverse limits of Ore domains. — *Extensions of finite degree*: Generalities. The Sweedler predual and the Jacobson-Bourbaki correspondence. Galois theory. Pseudo-linear extensions. Cyclic outer Galois extensions. — *The general embedding*: The category of epic R -fields and specializations. The construction of epic R -fields. Firs and semifirs. — *Coproducts of fields*: The coproduct construction for groups and rings. Projective modules over coproducts over skew fields. The monoid of projectives. The tensor K -ring on a bimodule. Subfields of field coproducts. Extensions with different left and right degrees. — *General skew field extensions*: Presentations of skew fields. Existentially closed skew fields. A specialization lemma. The word problem for free fields. A skew field with unsolvable word problem. — *Rational relations and rational identities*: Polynomial identities. Rational identities. Specializations. A special type of rational identity. The rational meet of a family of X -rings. The support relation. Examples. — *Equations and singularities*: Equations over skew fields. Left and right eigenvalues of a matrix. Canonical forms for a single matrix over a skew field. Special cases of the singular eigenvalue problem. Specializations and the rational topology. Algebraic dependence.

Henry L. ALDER and Edward B. ROESSLER. — **Introduction to probability and statistics**. — 6th edition. — Un vol. broché, 15,5 × 24, de XXII, 426 p. — Prix: \$8.80.— W. H. Freeman and Co., San Francisco, 1977.

Preface. — Introduction. — Organization of data. — Sommation notation. — Analysis of data. — Elementary probability, permutations and combinations. — The binomial distribution (and other discrete distributions). — The normal distribution (and Poisson distribution). — Random sampling. Large sample theory. — Testing hypotheses, significance levels, confidence limits. Large sample methods. — Student's t -distribution. Small sample methods. — Nonparametric statistics. — Regression and correlation. — Chi-square distribution. — Index numbers. — Time series. — The F -distribution. — The analysis of variance. — *Appendix*: Selected readings. Tables. Review exercises. Answers to odd-numbered exercises. Index.

A. KAUFMANN et E. PICHAU. — **Méthodes mathématiques non numériques et leurs algorithmes.** — Tome 1: Algorithmes de recherche des éléments maximaux. — Un vol. broché, 17 × 25, de xiv, 189 p. — Masson, Paris/New York/Barcelone/Milan, 1977.

Preface. — Tableau des principaux algorithmes. — *Nature particulière des problèmes non-numériques en mathématiques*: Introduction. Structures algébriques et configurations. Graphes, relations et généralisations. Principales structures algébriques. Configurations d'ordre. Treillis. Algèbre de Boole. Extension aux algèbres n -aires. Extension aux concepts flous de Zadeh. Applications et morphismes. Catégories. — *Représentation d'un sous-ensemble de pavés*: Introduction. Monômes premiers d'une fonction booléenne. Rectangles maximaux inclus dans une relation binaire. Sous-ensemble de pavés. Pavés maximaux. Pavés compatibles. Représentation d'un sous-ensemble de pavés à l'aide de pavés *-irréductibles. Premiers algorithmes pour représenter un sous-ensemble de pavés à l'aide de pavés maximaux. — *Algorithmes en file pour rechercher les éléments maximaux de structures algébriques*: Introduction. Notations et hypothèses concernant la structure algébrique $\langle A, \leqslant, * \rangle$. Algorithmes en file primitifs. Condition de décomposition concernant la structure algébrique $\langle A, \leqslant, * \rangle$ et algorithmes décomposés. Autres algorithmes pour représenter un sous-ensemble de pavés à l'aide de pavés maximaux. Calcul de la relation d'équivalence réunion de relations d'équivalence.

A. KAUFMANN et E. PICHAU. — **Méthodes mathématiques non numériques et leurs algorithmes.** — Tome 2: Algorithmes de recherche de chemins et problèmes associés. — Un vol. broché, 17 × 25, de xiv, 159 p. — Masson, Paris/New York/Barcelone/Milan, 1977.

Recherche de chemins et problèmes homomorphes: Introduction. — Concaténation et *-composition de chemins. — Algorithmes matriciels de cheminement ou algorithmes matriciels de recherche des éléments maximaux: Algorithmes matriciels de cheminement à tours. Algorithmes matriciels de cheminement progressifs. Algorithme matriciel de cheminement décomposé. Algorithmes matriciels de cheminement récursifs. — Enumération de chemins dans un multigraphe: premier, deuxième, troisième exemple. — Enumération des éléments maximaux de premier (ou de dernier) indice fixé: Algorithme matriciel en cascade et/ou décomposé, donnant les éléments maximaux de deuxième indice n . Algorithmes matriciels à tours irredondants et algorithmes matriciels à pas. Algorithme matriciel de la pile donnant les éléments maximaux de deuxième indice fixé. — Premier cas particulier. Algorithmes de cheminement dans le cas où le graphe associé à MAX A est sans circuit: Algorithme matriciel en cascade dans le cas où le graphe associé à MAX A n'admet pas de circuits autres que des boucles. Algorithme matriciel décomposé dans le cas où le graphe associé à MAX A n'admet pas de circuits autres que des boucles. Algorithme matriciel emboîté dans le cas où le graphe associé à MAX A n'admet pas de circuits autres que des boucles. Algorithmes matriciels de la pile. — Deuxième cas particulier. Algorithmes de cheminement symétriques. — Algorithmes de cheminement en file. — Problèmes homomorphes à un cheminement. Fermeture transitive de matrices: Fermeture transitive d'une matrice définie sur un gerbier et éléments maximaux. Algorithmes homomorphes à des algorithmes de cheminement. Fermetures transitives de matrices définies sur un gerbier avec loi d'absorption. Fermeture transitive d'une matrice définie sur un dioïde. Exemples de fermetures transitives non stationnaires. Exemples de fermetures transitives stationnaires. Pseudo-treillis distributif.

A. KAUFMANN. — **Introduction à la théorie des sous-ensembles flous à l'usage des ingénieurs (fuzzy sets theory).** — Tome 1: Eléments théoriques de base. — 2^e édition revue et corrigée. — Un vol. relié, 17 × 25, de xxi, 424 p. — Masson, Paris/New York/Barcelone/Milan, 1977.

Notions de base: Rappel sur la notion d'appartenance. Le concept de sous-ensemble flou. Relation de domination. Opérations simples sur les sous-ensembles flous. Ensembles des parties floues pour E et M finis. Propriétés de l'ensemble des parties floues. Produit et somme algébrique de deux sous-ensembles flous. — *Graphes flous et relations floues*: Graphe flou. Relation floue. Composition de deux relations floues. Sous-ensemble flou induit par une application. Sous-ensembles flous conditionnés. Propriétés des relations binaires floues. Fermeture transitive d'une relation binaire floue. Chemin dans un graphe flou fini. Relation de pré-ordre floue. Relation de similitude. Sous-relations de similitude dans un pré-ordre flou. Antisymétrie. Relation d'ordre floue. Relation antisymétrique sans circuit. Relation ordinaire. Fonction ordinaire dans une relation d'ordre flou. Relation de dissimilitude. Relation de ressemblance. Propriétés diverses concernant la similitude et la ressemblance. Propriétés diverses concernant les relations d'ordre parfait floues. Fonctions d'appartenance usuelles. — *La logique floue*: Fonction caractéristique d'un sous-ensemble flou. Variable floues. Formes polynomiales. Analyse d'une fonction de variables floues. Méthode de Marinos. Structure logique d'une fonction de variables floues. Composition des intervalles. Synthèse d'une fonction de variables floues. Réseau d'éléments flous. Propositions floues et leur représentation fonctionnelle. La théorie des sous-ensembles flous et la théorie des probabilités. La théorie des sous-ensembles flous et la théorie des fonctions de structure. — *Lois de composition floues*: Rappel sur la notion de loi de composition. Loi de composition interne floue. Groupoïde flou. Principales propriétés concernant les groupoïdes flous. Monoïdes flous. Composition externe floue. Opérations sur des nombres flous. — *Généralisation de la notion de sous-ensemble flou*: Opérations sur des ensembles vulgaires. Propriétés fondamentales de l'ensemble des applications d'un ensemble dans un autre. Rappel sur quelques structures fondamentales. Généralisation de la notion de sous-ensemble flou. Opérations sur les sous-ensembles flous où L est un treillis. Rappel de diverses notions en vue d'expliquer le concept de catégorie. Le concept de catégorie. C -morphismes flous. — Annexes.

A. KAUFMANN. — **Introduction à la théorie des sous-ensembles flous à l'usage des ingénieurs (fuzzy sets theory).** — Tome 4: Compléments et nouvelles applications. — Un vol. relié, 17 × 25, de x, 334 p. — Prix: FF 196. — Masson, Paris/New York/Barcelone/Milan, 1977.

Compléments: Introduction. Sous-ensembles flous probabilisés. Flou, désordre et entropie. Rappel de topologie. Topologie floue. Résolution des équations de relations floues. Hypergraphes flous. Matroïdes flous. — *Applications aux problèmes de comportement humain*: Introduction. Ebauche d'une théorie formelle de l'opérateur humain. Ebauche d'une théorie floue de l'opérateur humain. Comportement de n opérateurs humains. Procédures de stimulation inventive. Perceptrons et combinatoires. — *Annexe*: Remarques au sujet de la distance de Hamming et de la distance euclidienne.

George E. ANDREWS. — **The theory of partitions.** — Encyclopedia of mathematics and its applications, vol. 2. — Un vol. relié, xiv, 255 p. — Prix: £14.00. — Addison-Wesley Publ. Co., London/Amsterdam/Don Mill, Ontario/Sydney/Tokyo, 1976.

The elementary theory of partitions: Infinite product generating functions of one variable. Graphical representation of partitions. — *Infinite series generating functions*:

Elementary series-product identities. Applications to partitions. — *Restricted partitions and permutations*: The generating function for restricted partitions. Properties of Gaussian polynomials. Permutations and Gaussian multinomial coefficients. The unimodal property. — *Compositions and Simon Newcomb's problem*: Composition of numbers. Vector compositions. Simon Newcomb's problem. — *The Hardy-Ramanujan-Rademacher expansion of $p(n)$* : The formula for $p(n)$. — *The asymptotics of infinite product generating functions*: Proof and applications of theorem 6.2. — *Identities of the Rogers-Ramanujan type*: The generating functions. The Rogers-Ramanujan identities and Gordon's generalization. The Göllnitz-Gordon identities and their generalization. — *A general theory of partition identities*: Foundations. Partition ideals of order 1. Linked partition ideals. — *Sieve methods related to partitions*: Inclusion-exclusion. A sieve for successive ranks. — *Congruence properties of partition functions*: Rödseth's theorem for binary partitions. Ramanujan's conjecture for 5^n . — *Higher-dimensional partitions*: Plane partitions. The Knuth-Schensted correspondence. Higher-dimensional partitions. — *Vector of multipartite partitions*: Multipartite generating functions. Bell polynomials and formulas for multipartite partition functions. Restricted bipartite partitions. — *Partitions in combinatorics*: Partitions and finite vector spaces. Partitions of sets. The combinatorics of symmetric functions. — *Computations for partitions*: Elementary algorithms. Algorithms from generating functions. Computations for higher-dimensional partitions. Brief tables of partition functions. Table of the plane partition function. Table of Gaussian polynomials. Guide to tables. — Examples, notes, references (à la fin de chaque chapitre).

R. D. DRIVER. — **Ordinary and delay differential equations.** — Applied mathematical sciences, 20. — Un vol. broché, 15 × 24, de ix, 501 p. — Prix: DM 33.60. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Elementary methods for ordinary differential equations of first order: Examples and classification. Linear equations. Separable equations. — *Uniqueness and Lipschitz conditions for ordinary differential equations*: First order scalar equations. Systems of equations. Higher order equations. Complex solutions. A valuable lemma. A boundary value problem. — *The linear equation of order n* : Constant coefficients (the homogeneous case). Linear independence and Wronskians. Constant coefficients (general solution for simple h). Variation of parameters. — *Linear ordinary differential systems*: Some general properties. Constant coefficients. Oscillations and damping in applications. Variation of parameters. Matrix norm. Matrix exponential. Existence of solutions (successive approximations). — *Introduction to delay differential equations*: Examples and the method of steps. Some distinguishing features and some "wrong" questions. Lipschitz condition and uniqueness. — *Existence theory*: Ordinary differential systems. Systems with bounded delays: notation and uniqueness. Systems with bounded delays: existence. — *Linear delay differential systems*: Superposition. Constant coefficients. Variation of parameters. — *Stability*: Definitions and examples. Lyapunov method for uniform stability. Asymptotic stability. Linear and quasi-linear ordinary differential systems. Linear and quasi-linear delay differential systems. — *Autonomous ordinary differential systems*: Trajectories and critical points. Linear systems of second order. Critical points of quasi-linear systems of second order. Global behavior for some nonlinear examples. — Appendices.

R. COURANT; K. O. FRIEDRICHHS. — **Supersonic flow and shock waves.** — Applied mathematical sciences, vol. 21. — Un vol. relié, 17 × 25, de xvi, 464 p. — Prix: DM 45.00. — Springer Verlag, New York/Heidelberg/Berlin, 1976. [Reprint of the 1948 edition].

Compressible fluids: General equations of flow. Thermodynamic notions. Differential equations for specific types of flow. — *Mathematical theory of hyperbolic flow*

equations for functions of two variables. — *One-dimensional flow*: Continuous flow. Rarefaction and compression waves. Shocks. Interactions. Detonation and deflagration waves. — *Isentropic irrotational steady plane flow*: Hodograph method. Characteristics and simple waves. Oblique shock fronts. Interactions: shock reflection. Approximate treatments of interactions. Airfoil flow. Remarks about boundary value problems for steady flow. — *Flow in nozzles and jets*. — *Flow in three dimensions*: Steady flow with cylindrical symmetry. Conical flow. Spherical waves.

A. D. THOMAS. — **Zeta-functions: an introduction to algebraic geometry.** — Research notes in mathematics, vol. 12. — Un vol. broché, 17 × 25, de viii, 230 p. — Prix: £7.50. — Pitman publishing, London/San Francisco/Melbourne, 1977.

Introduction. — Dirichlet series. — Classical number theory. — Artin's thesis. — Valuation theory. — Global fields. — Algebraic curves. — Riemann surfaces. — Elliptic curves. — Varieties. — Complex manifolds. — Hodge theory. — Schemes.

A. DONEDDU. — **Nouveau cours de mathématiques. Tome 3: Espaces euclidiens, espaces hermitiens, géométries.** — Un vol. broché, 16 × 24, de 283 p. — Prix: FF 58.00.— Vuibert, Paris, 1977.

Espaces euclidiens, espaces hermitiens : Formes bilinéaires et formes quadratiques : Formes bilinéaires. Formes bilinéaires symétriques. Formes quadratiques. Orthogonalité. Noyau. Eléments isotropes. Groupe orthogonal. Formes bilinéaires en dimension finie. Bases orthogonales. Bases orthonormales. Exercices. — *Espaces euclidiens*: Formes bilinéaires réelles. Formes bilinéaires symétriques positives. Espaces euclidiens. Produit scalaire. Orthogonalité. Isométries. Groupe orthogonal. Espaces euclidiens de dimension finie. Matrices orthogonales. Groupe orthogonal. Endomorphisme adjoint. Loi d'inertie. Exercices. — *Espaces hermitiens*: Formes sesquilinéaires. Formes hermitiennes. Formes non dégénérées. Bases orthogonales. Bases orthonormales. Formes hermitiennes positives. Produit scalaire hermitien. Groupe unitaire. Endomorphismes adjoints. Diagonalisation des endomorphismes auto-adjoints. Exercices. — *Géométrie affine*. *Géométrie affine euclidienne*: *Géométrie affine*: Translations. Variétés linéaires. Applications affines. Droites et hyperplans. Plans vectoriels et affines. Cas où E est de dimension finie. Changement de repère. Exercices. — *Géométrie affine réelle*: Espace affine réel. Ensembles convexes. La droite en géométrie plane (affine réelle). Espace affine réel de dimension 3. Intersections de droites et plans. Exercices. — *Géométrie euclidienne*: Espace affine euclidien. Orientation. Produit vectoriel. Produit mixte. Généralisation. Géométrie euclidienne plane. Géométrie euclidienne de dimension 3. Angles. Autres types de repères. Coordonnées polaires dans le plan. Coordonnées cylindriques. Coordonnées sphériques. Exercices. — *Les coniques dans le plan euclidien*: Le cercle. La sphère. Coniques. Equation polaire des coniques. Equation générale des coniques. Exercices. — *Surfaces*: Généralités. Surfaces cylindriques. Surfaces coniques. Surfaces conoïdes. Surfaces de révolution. Quadriques. Exercices.

Functional analysis: proceedings of the Brazilian mathematical society symposium, Campinas, Brazil. — Ed. by Djairo Guedes de Figueiredo. — Lecture notes in pure and applied mathematics, vol. 18. — Un vol. broché, 18 × 26, de viii, 325 p. — Prix: SF 82.00. — Marcel Dekker, New York/Basel, 1976.

M. S. Baouendi: Iterates of elliptic operators and Bernstein inequalities. — Jörg Blatter: Hewitt's Stone-Weierstrass theorems for ordered topological spaces. — Alberto Calderon and Alberto Torchinsky: Classes of distributions with parabolic maximal

functions in $L^p(R^n)$. — *Fernando Cardoso* : Locally solvable pseudodifferential operators with double characteristics. — *David G. Costa* : Energy concentration for first-order hyperbolic systems. — *Ubiratan d'Ambrosio* : Existence theorems in higher dimensional calculus of variations. — *Antonio Gilioli* : On the local solvability of linear partial differential operators. — *Peter Hess* : On strongly nonlinear elliptic problems. — *Peter Hilton* : Unfolding of singularities. — *Chaim Samuel Höning* : The Dirichlet and substitution formulas for Riemann-Stieltjes integrals in Banach spaces. — *A. F. Izé and O. F. Lopes* : Functional differential equations. — *L. A. Karlovitz* : On the geometry and structure of Banach spaces. — *Wilhelm Kaup* : Analytic transformation groups. — *Mario C. Matos* : On locally convex spaces with the Montel property. — *Leopoldo Nachbin* : Some holomorphically significant properties of locally convex spaces. — *B. P. Neves and L. A. Medeiros* : Remarks on nonlinear evolution equations in noncylindrical domains. — *Domingos Pisanelli* : Solutions of a nonlinear abstract Cauchy-Kovalewsky system as a local Banach analytic manifold. — *W. H. Summers* : Weighted approximation and full completeness in spaces of continuous functions. — *Giovanni Vidossich* : An invitation to the theory of ordinary differential equations in Banach spaces.

PETERSEN, K. E. — **Brownian motion, Hardy spaces and bounded mean oscillation.** — London mathematical society lecture note series, vol. 28. — Un vol. broché, 16 × 23 cm; de 105 p. — Prix: £3.95. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Introduction. — *The maximal, square and Littlewood-Paley functions.* — *Brownian motion* : Definition. Construction. Some properties of the Brownian paths. The martingale and Markov properties. The strong Markov property. Kakutani's theorem. — *Distribution equivalence of the two maximal functions* : The right-hand inequality. Conditioned Brownian motion. Removal of the restrictions on σ and r . Conditionally reflected Brownian motion. — *Inequalities for the conjugate function* : A Brownian maximal function inequality. The M. Riesz inequalities. — *The maximal function characterization of H^p .* — *The martingale versions of H^p and BMO* : H^p martingales. BMO martingales. The duality theorem.

Norman BLEISTEIN and Richard A. HANDELSMAN. — **Asymptotic expansions of integrals.** — Un vol. relié, 17 × 24, de XIII, 425 p. — Prix: £18.00. — Holt, Rinehart and Winston, New York/Chicago/San Francisco/Atlanta/Dallas/Montreal/Toronto/London/Sydney, 1975.

Fundamental concepts : Order relations. Asymptotic power series expansions. Asymptotic sequences and asymptotic expansions of Poincaré type. Auxiliary asymptotic sequences. Complex variables and the Stokes phenomenon. Operations with asymptotic expansions of Poincaré type. Exercises. — *Asymptotic expansions of integrals: preliminary discussion* : Introduction. The gamma and incomplete gamma functions. Integrals arising in probability theory. Laplace transform. Generalized Laplace transform. Wave propagation in dispersive media. The Kirchhoff method in acoustical scattering. Fourier series. Exercises. — *Integration by parts* : General results. A class of integral transforms. Identification and isolation of critical points. An extension of the integration by parts procedure. Exercises. — *h-transforms with kernels of monotonic argument* : Laplace transforms and Watson's lemma. Results on Mellin transforms. Analytic continuation of Mellin transforms. Asymptotic expansions for real λ . Asymptotic expansions for small real λ . Asymptotic expansions for complex λ . Electrostatics. Heat conduction in a nonlinearly radiating

solid. Fractional integrals and integral equations of Abel type. Renewal processes. Exercises. — *h-transforms with kernels of nonmonotonic argument*: Laplace's method. Kernels of exponential type. Kernels of algebraic type. Expansions for small λ . Exercises. — *h-transforms with oscillatory kernels*: Fourier integrals and the method of stationary phase. Further results on Mellin transforms. Kernels of oscillatory type. Oscillatory kernels: continuation. Exercises. — *The method of steepest descents*: Preliminary results. The method of steepest descents. The airy function for complex argument. The gamma function for complex argument. The Klein-Gordon equation. The central limit theorem for identically distributed random variables. Exercises. — *Asymptotic expansions of multiple integrals*: Asymptotic expansion of double integrals of Laplace type. Higher-dimensional integrals of Laplace type. Multiple integrals of Fourier type. Parametric expansions. Exercises. — *Uniform asymptotic expansions*: Asymptotic expansions of integrals with two nearby saddle points. Underlying principles. Saddle point near an amplitude critical point. A class of integrals that arise in the analysis of precursors. Double integrals of Fourier type. Exercises.

P. P. N. DE GROEN. — **Singularly perturbed differential operators of second order.** — Mathematical centre tracts, n° 68. — Un vol. broché, 16 × 24, de ix, 159 p. — Prix: DFL 20.00. — Mathematisch Centrum, Amsterdam, 1976.

Preliminaries: Abstract perturbation theorems. Sobolev spaces. Critical points of first order partial differential operators in the plane. — *Perturbations of d/dx* : L^2 -convergence of the resolvent operator. Asymptotic expansions. Discussions of the results. — *Perturbations of xd/dx* : Examples. Convergence of the spectrum. Strong L^2 -convergence of the resolvent in the plus-sign case. Strong convergence in $H^{-n}(-1, 1)$. Estimates of order $\mathcal{O}(\varepsilon)$ in weighted norms. The minus sign case: estimates in a uniform norm. Convergence in $H^n(-1, 1)$. Discussion of the results. — *Elliptic perturbation of a first order operator in \mathbf{R}^2 with a critical point of nodal type*: Convergence of the spectrum. Strong convergence of the resolvent in the case of an attracting node. Convergence of the solution of an annular subdomain of Ω . A repelling node: convergence for $\operatorname{Re} \lambda > 0$. A proof of convergence for all $\lambda \in \mathbf{C} / \Lambda^*$ by a cut-off method. Convergence in $H^{2n}(\Omega)$. Discussion of the results. — *Perturbation of a first order operator of vortex type*. — *Perturbation of a first order operator of saddlepoint type*: Convergence of the spectrum. Strong convergence. Convergence on subdomains of Ω . Convergence in non-isotropic spaces.

J. K. LENSTRA. — **Sequencing by enumerative methods.** — Mathematical centre tracts, n° 69. — Un vol. broché, 16 × 24, de x, 198 p. — Prix: DFL 24.00. — Mathematisch Centrum, Amsterdam, 1977.

Part. 1 : Sequencing problems : Complexity theory. — *Quadratic assignment problems*: The quadratic assignment problem. The acyclic subgraph problem. The travelling salesman problem. — *Machine scheduling problems*: Classification. Complexity. Remarks. — *Part. 2 : Enumerative methods : Recursive implementation.* — *An example : generation of permutations*: Introduction. Minimum-change generators. Lexicographic generators. Computational experience. — *Explicit enumeration*. — *Implicit enumeration*. — *Part 3 : Sequencing by implicit enumeration*: *The travelling salesman problem*: Algorithms. Computational experience. Remarks. — *One-machine scheduling I : minimizing maximum lateness*: Algorithms. Computational experience. Remarks. — *One-machine scheduling II : minimizing total costs*: A new algorithm. Computational experience. Remarks. — *Permutation flow-shop scheduling*: Algorithms. Computational experience. Remarks. —

Job-shop scheduling : Algorithms. Computational experience. Remarks. — *Part 4 : Some applications* : *Applications of the travelling salesman problem* : Computer wiring. Vehicle routing. Clustering a data array. Job-shop scheduling with no wait in process. — *An application of machine scheduling theory* : Problem description. A heuristic approach. Results. Remarks.

M. REM. — **Associons and the closure statement.** — Mathematical centre tracts, n° 76. — Un vol. broché, 16 × 24, de vii, 115 p. — Prix: DFL 14.00. — Mathematisch Centrum, Amsterdam, 1976.

Prologue. — Associons. — Characterization of states. — An appreciation of the closure statement. — Closure of a set of associons. Formal definition of the closure statement. — Some small examples. — An appreciation of the repetitive construct. — Formal definition of the repetitive construct. — Some examples. — Dynamically created names. — Recording the cliques of an undirected graph. — On what we have rejected. — Epilogue.

M. C. A. van ZUIJLEN. — **Empirical distributions and rank statistics.** — Mathematical centre tracts, n° 79. — Un vol. broché, 16 × 24, de vii, 92 p. — Prix: DFL 12.00. — Mathematisch Centrum, Amsterdam, 1977.

Introduction. — *Some fundamental properties of the empirical df in the non-i.i.d. case* : Properties of the univariate empirical *df* in the case of continuous underlying *df*'s. A property of the multivariate empirical *df* in the case of continuous underlying *df*'s. Discontinuous underlying *df*'s. — *Asymptotic theory of rank statistics* : Statement of the main theorem. Asymptotic normality of the leading terms. Some lemmas on empirical *df*'s. Asymptotic negligibility of the remainder term. Exact scores. Scores generating functions which are continuous, but not necessarily of product type. Scores generating functions which are not necessarily continuous or product type.

John F. PRICE. — **Lie groups and compact groups.** — London mathematical society lecture note series, vol. 25. — Un vol. broché, 23 × 15,5, de ix, 177 p. — Prix: £4.95. — Cambridge University Press, Cambridge/London/New York, Melbourne, 1977.

Analytic manifolds : Manifolds and differentiability. The tangent bundle. Vector fields. Notes. Exercises. — *Lie groups and Lie algebras* : Lie groups. The Lie algebra of a Lie group. Homomorphisms of Lie groups. The general linear group. Notes. Exercises. — *The Campbell-Baker-Hausdorff formula* : The *CBH* formula for lie algebras. The *CBH* formula for Lie groups. Closed subgroups. Simply connected Lie groups. Notes. Exercises. — *The geometry of Lie groups* : Riemannian manifolds. Invariant metrics on Lie groups. Geodesics on Lie groups. Notes. Exercises. — *Lie subgroups and subalgebras* : Subgroups and subalgebras. Normal subgroups and ideals. Notes. Exercises. — *Characterisations and structure of compact Lie groups* : Compact groups and Lie groups. Linear Lie groups. Simple and semisimple Lie algebras. The structure of compact Lie groups. Compact connected groups. Notes. Exercises. — *Appendix : Abstract harmonic analysis* : Topological groups. Representations. Compact groups. The Haar integral.

K. G. BINMORE. — **Mathematical analysis: a straightforward approach.** — Un vol. broché, 23 × 15, de x, 257 p. — Prix: £3.75. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Preface. — Real numbers. — Continuum property. — Natural numbers. — Convergent sequences. — Subsequences. — Series. — Functions. — Limits of functions. — Continuity. — Differentiation. — Mean value theorems. — Monotone functions. — Integration. — Exponential and logarithm. — Power series. — Trigonometric functions. — The gamma function. — Appendix. — Solutions to exercises.

Thomas WONNACOTT. — **Calculus: an applied approach.** — Un vol. relié, 17 × 24, de xiv, 514 p. — Prix: £9.70. — John Wiley and Sons, New York/Santa Barbara/London/Sydney/Toronto, 1977.

Part one: Differential calculus: *Limits* : The number e . Limits of sequences generally. Limits of functions. More about e . — *Differentiation* : Differencing example: marginal tax. Derivative example: marginal tax continued. The derivative in general. — *Techniques of differentiation* : Differentiation as a linear operator. Simplest formulas. The chain rule. Inverse functions. Log and exponential functions. Review of differentiation. Some differencing formulas. Second derivatives. Proofs. — *Applications of differentiation* : Marginal analysis in economics. Velocity (speed). Other rates. — *Optimization (maximum or minimum)* : Joining critical points. Some false alarms. Infinite domains. Applications. An alternative way to find extreme values. Discontinuous functions. — *Functions of several variables* : Partial differentiation. Optimization. Constrained optimization. — Part two: Integral calculus: *Summation* : Antidifferencing. Definite sums. Techniques of antidifferencing. Applications. — *Integration* : Antidifferentiation. Definite integrals. Techniques of antidifferentiation. Applications. Numerical integration. Proof of the fundamental theorem. — *Sin and cos* : Definitions and identities. Cycles. Differentiation and integration. Proofs. — *Difference equations* : Introduction and definitions. Theory of linear difference equations. Homogeneous LDE. Nonhomogeneous LDE. Initial conditions. Applications: gambler's ruin. — *Differential equations* : Homogeneous LDE. Nonhomogeneous LDE. Initial conditions. Some nonlinear differential equations. Applications. — Appendices.

Constructive theory of functions of several variables. — Proceedings of a conference held at Oberwolfach, April 25-May, 1, 1976. — Ed. by W. Schempp and K. Zeller. — Lecture notes in mathematics, vol. 571. — Un vol. broché, 16,5 × 24, de vi, 290 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

22 exposés par: J. Albrecht et H. Engels; B. O. Björnestal; K. Böhmer et G. H. Coman; J. Boman; F. J. Delvos et H. Posdorf; B. Dreseler; J. Duchon; W. Haussmann et P. Pottinger; K. Jetter et F. Locher; H. Johnen et K. Scherer; T. Koornwinder; H. M. Möller; W. Niethammer; M. Reimer; A. Sard; W. Schäfer et W. Schempp; W. Schempp; H. J. Schmid; H. S. Shapiro; D. D. Stancu; W. Trebels.

Group theory: proceedings of a miniconference held at the Australian national university, Canberra, November 4-6, 1975. — Ed. by R. A. Bryce, J. Cossey and M. F. Newman. — Lecture notes in mathematics, vol. 573. — Un vol. broché, 16,5 × 24, de vii, 146 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

T. R. Berger : Fixed point free automorphism groups. — *R. A. Bryce and J. Cossey* : Strong containment of Fitting classes. — *S. B. Conlon* : Nonabelian subgroups of prime-power of classical groups of the same prime degree. — *T. M. Gagen* : A note on groups

with the inverse Lagrange property. — *M. Herzog and G. I. Lehrer*: A note concerning Coxeter groups and permutations. — *S. Janakiraman et K. M. Rangaswamy*: Strongly pure subgroups of abelian groups. — *Hans Lausch*: Relative cohomology of groups. — *M. F. Newman*: Determination of groups of prime-power order. — *Cheryl E. Praeger et Alan Rahilly*: On partially transitive projective planes of certain Hughes types. — *D. E. Taylor*: Groups whose modular group rings have soluble unit groups. — *J. W. Walmsley*: Computing soluble groups. — *J. N. Ward*: A note on the Todd-Coxeter algorithm. — *John S. Wilson*: Locally soluble groups satisfying the minimal condition for normal subgroups. — *G. Karpilovsky*: Some results in group representation theory.

Johan MOLDESTAD. — **Computations in higher types.** — Lecture notes in mathematics, vol. 574. — Un vol. broché, 16,5 × 24, de v, 203 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Abstract. — The computation domain. — Recursion on α . — Connection with Kleene recursion in higher types. — Recursion in normal lists on α . — Kleene recursion in normal objects of type $n + 2$, $n < 0$. — Computation theories on α . — Abstract Kleene theories. — Normal computation theories on α . — More about Mahloness. — Calculation of the lengths of some computations. — Gaps. — On Platek: “Foundations of recursion theory”. — A final comment concerning the two types.

K-theory and operator algebras. — Proceedings of a conference held at the University of Georgia in Athens, Georgia, April 21-25, 1975. — Ed. by B. B. Morrel and I. M. Singer. — Lecture notes in mathematics, vol. 575. — Un vol. broché, 16,5 × 24, de vi, 191 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

M. F. Atiyah: A survey of K -theory. — *Lawrence G. Brown*: Characterizing $\text{ext}(X)$. — *Richard W. Carey and Joel D. Pincus*: Almost commuting algebras. — *R. G. Douglas*: Extensions of C^* -algebras and K -homology. — *Karl Heinrich Hofmann*: Bundles and sheaves are equivalent in the category of Banach spaces. — *Jerome Kaminker*: Topological obstructions to perturbations of pairs of operators. — *Ronnie Lee and R. H. Szczarba*: On algebraic K -theory and the homology of congruence subgroups. — *Dusa Macduff*: Configuration spaces. — *Carl Pearcy and Norberto Salinas*: Extensions of C^* -algebras and the reducing essential matricial spectra of an operator. — *Graeme Segal*: K -homology theory and algebraic K -theory. — *I. M. Singer*: Some remarks on operator theory and index theory. — *Masamichi Takesaki*: Factors of type III. — *Joseph L. Taylor*: Twisted products of Banach algebras and third Cech cohomology. — *J. B. Wagoner*: H -cobordisms, pseudo-isotopies, and analytic torsion.

J. Peter MAY. — **E_∞ ring spaces and E_∞ ring spectra.** — With contributions by Frank Quinn, Nigel Ray, and Jørgen Tornehave. — Lecture notes in mathematics, vol. 577/ — Un vol. broché, 16,5 × 24, de iv, 268 p. — Prix: DM 24.80. — Springer Verlag, Berlin. Heidelberg/New York, 1977.

\mathcal{I} -functors: Linear isometries and classical groups. — The bar construction; Top and PL . — *Coordinate-free spectra*: Spaces, prespectra, and spectra. The stable homotopy category. Cohomology; periodic spaces and spectra. — *Orientation theory*: Elementary orientation theory. Classification of E -oriented GV -bundles. — *E_∞ ring spectra*: E_∞ ring

prespectra and spectra. \mathcal{I}_* prefunctors and Thom spectra. Orientation theory for E_∞ ring spectra. — *On k0-oriented bundle theories*: E -orientations of stable bundle theories. Cannibalistic classes and the comparison diagram. The $k0$ -orientation of Spin and the J -theory diagram. Local analysis of the J -theory diagram. J Spin X and the δ and ϵ invariants. Sullivan's analysis of topological bundle theory. Infinite loop analysis of the main diagrams. — *E_∞ ring spaces and bi-permutative categories*: The definition of E_∞ ring spaces. Units; examples of operad pairs. Symmetric bimonoidal and bipermutative categories. Bipermutative categories and E_∞ ring spaces. Examples of bipermutative categories. — *The recognition principle for E_∞ ring spaces*: The little convex bodies operads. The canonical E_∞ operad pair. The one operad recognition principle. The two operad recognition principle. The multiplicative E_∞ structure and localizations. — *Algebraic and topological K-theory*: Examples; algebraic K -theory. Bott periodicity and Brauer lifting. Finite fields, Frobenius, and B Coker J . The splitting of SF at odd primes. — *Pairings in infinite loop space theory*: Pairings of categories and of \mathcal{D} -spaces. The recognition principle for pairings.

Combinatoire et représentation du groupe symétrique. — Actes de la Table ronde du CNRS tenue à l'Université Louis-Pasteur de Strasbourg, 26 au 30 avril 1976. — Ed. par D. Foata. — Lecture notes in mathematics, vol. 579. — Un vol. broché, 16,5 × 24, de iv, 339 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

G. de B. Robinson: The papers of Alfred Young. — *Algèbre des tableaux de Young*: *G. Viennot*: Une forme géométrique de la correspondance de Robinson-Schensted. *M.-P. Schützenberger*: La correspondance de Robinson. *C. Greene*: Some order-theoretic properties of the Robinson-Schensted correspondence. *D. Foata*: Une propriété de viddage-remplissage des tableaux de Young. — *Fonctions symétriques*: *A. O. Morris*: A survey on Hall-Littlewood functions and their applications to representation theory. *Glânfrwd Thomas*: Further results on Baxter sequences and generalized Schur functions. *L. Geissinger*: Hopf algebras of symmetric functions and class functions. — *A. Lascoux*: Calcul de Schur et extensions grassmanniennes des λ -anneaux. *R. P. Stanley*: Some combinatorial aspects of the Schubert calculus. *J. McConnell*: Note on multiplication theorems for Schur functions. — *Calcul des caractères et groupes de permutations*: *J. Saxl*: Restrictions of characters, generosity, interchange and coloured graphs. *N. Esper and A. Kerber*: Permutrization of representations. *M. Klemm*: Charaktere mehrfach transitiver Permutationsgruppen. — *Partitions et algorithmes combinatoires*: *G.E. Andrews*: Implications of the MacMahon conjecture. *W. Oberschelp*: Monotonicity for structure numbers in theories without identity. *S. G. Williamson*: On the ordering, ranking, and random generation of basic combinatorial sets.

C. CASTAING; M. VALADIER. — **Convex analysis and measurable multifunctions.** — Lecture notes in mathematics, vol. 580. — Un vol. broché, 16,5 × 24, de vii, 278 p. — Prix: DM 24.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1977.

Convex functions. — Hausdorff distance and Hausdorff uniformity. — Measurable multi-functions. — Topological property of the profile of a measurable multifunction with compact convex values. — Compactness theorems of measurable selections and integral representation theorem. — Primitive of multifunctions and multivalued differential equations. — Convex integrand on locally convex spaces. Applications. — A natural supplement of L^1 in the dual of L^∞ . Applications.

Séminaire de probabilité XI, Université de Strasbourg. — Edité par C. Dellacherie, P. A. Meyer, M. Weil. — Lecture notes in mathematics, vol. 581. — Un vol. broché, $16,5 \times 24$, de v, 573 p. — Prix: DM 42.00. — Springer Verlag, Berlin/Heidelberg/New York 1977.

V. Avanissian : Distributions harmoniques d'ordre infini et l'analyticité réelle liée à l'opérateur laplacien itéré. — A. Benveniste : Application d'un théorème de G. Mokobodzki à la théorie des flots. — K. L. Chung : Pedagogic notes on the barrier theorem. — C. Dellacherie : Les dérivations en théorie descriptive des ensembles et le théorème de la borne. — C. Dellacherie : Deux remarques sur la séparabilité optionnelle. — R.M. Dudley et S. Gutmann : Stopping times with given laws. — J. Horowitz : Une remarque sur les bimesures. — N. El Karoui et P. A. Meyer : Les changements de temps en théorie générale des processus. — N. El Karoui et G. Weidenfeld : Théorie générale et changement de temps. — P. A. Meyer : Convergence faible de processus d'après Mokobodzki. — P. A. Meyer : Résultats récents de Benveniste en théorie des flots. — P. A. Meyer : Le dual de $H^1(\mathbf{R}^y)$: démonstrations probabilistes. — M. Weber : Classes uniformes de processus gaussiens stationnaires. — M. Yor : Sur les théories du filtrage et de la prédiction. — P. A. Zanzotto : Sur l'existence d'un noyau induisant un opérateur sous markovien donné. — A. Bernard et B. Maisonneuve : Décomposition atomique de martingales de la classe H^1 . — A. Bernard : Complément de l'exposé précédent. — R. Cairoli et J. B. Walsh : Prolongement de processus holomorphes. Cas « carré intégrable ». — R. Cairoli et J. B. Walsh : Some examples of holomorphic processes. — R. Cairoli et J. B. Walsh : On changing time. — C. S. Chou : Le processus des sauts d'une martingale locale. — C. Dellacherie : Sur la régularisation des surmartingales. — C. Dellacherie et C. Stricker : Changements de temps et intégrales stochastiques. — C. Doleans-Dade et P. A. Meyer : Une caractérisation de BMO . — C. Doleans-Dade et P. A. Meyer : Equations différentielles stochastiques. — J. Jacod : Sur la construction des intégrales stochastiques et les sous-espaces stables de martingales. — M. Koskas : Images d'équations différentielles stochastiques. — E. Lenglart : Une caractérisation des processus prévisibles. — D. Lepingle : Sur la représentation des sauts des martingales. — B. Maisonneuve : Une mise au point sur les martingales locales continues définies sur un intervalle stochastique. — P. A. Meyer : Notes sur les intégrales stochastiques. — P. A. Meyer : Sur un théorème de C. Stricker. — J. B. Walsh : A property of conformal martingales. — M. Yor : A propos d'un lemme de Ch. Yoeurp. — M. Yor : Remarques sur la représentation des martingales comme intégrales stochastiques. — M. Yor : Sur quelques approximations d'intégrales stochastiques. — Exposés supplémentaires.

J. M. G. FELL. — Induced representations and Banach *-algebraic bundles. — With an appendix due to A. Douady and L. Dal Soglio-Héault. — Lecture notes in Mathematics, vol. 582. — Un vol. broché, $16,5 \times 24$, de iv, 349 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

The abstract inducing process and abstract imprimitivity : Operator inner products. Duality for operator inner products. Hermitian modules. Rigged modules and the abstract inducing process. General properties of abstract induction. The regional topology of representations and the continuity of the inducing process. Imprimitivity bimodules. The abstract imprimitivity theorem. Topological versions and examples of the abstracts imprimitivity theorem. — Banach*-algebraic bundles : Banach bundles. Banach *-algebraic bundles. Examples. The cross-sectional algebra. *-representations. The integrated form of a *-representation. Positive functionals on the cross-sectional algebra. When do enough *-representations exist ? The bundle C^* -completion. Bundle structures for

C-algebras.* The regional topology of *-representations of bundles. — *Induced representations and imprimitivity for Banach *-algebraic bundles*: The framework of the induction process in the bundle context. Positivity with respect to a Banach *-algebraic bundle. Equivalent conditions for positivity. The induced Hilbert bundle. The action of \mathbf{B} on the induced Hilbert bundle. The definition of the induced representation. The Mackey and Blattner descriptions of induced representations of groups. \mathbf{B} -positive *-representations and the bundle C^* -completion. Elementary properties of induced representations of Banach *-algebraic bundles. Transformation bundles. Systems of imprimitivity. The canonical imprimitivity bimodule. The imprimitivity theorem for Banach *-algebraic bundles. Conjugation of *-representations. — *Appendix*: The existence of continuous cross-sections of Banach bundles.

M. W. HIRSCH; C. C. PUGH; M. SHUB. — **Invariant manifolds.** — Lecture Notes in mathematics, vol. 583. — Un vol. broché, 16,5 × 24, de III, 149 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Introduction. — The linear theory of normal hyperbolicity. — The C^r section theorem and Lipschitz jets. — The local theory of normally hyperbolic invariant compact manifolds. — Pseudo hyperbolicity and plaque families. — Center manifolds. — Noncompactness and uniformity. — Forced smoothness of $i: V \rightarrow M$. — Branched laminations. — Normally hyperbolic foliations and laminations. — Local product structure and local stability. — Equivariant fibrations and nonwandering sets.

Wendell FLEMING. — **Functions of several variables.** — 2nd edition. — Undergraduate texts in mathematics. — Un vol. relié, 16,5 × 24, de xi, 411 p. — Prix: DM 41.00. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Euclidean spaces: The real number system. Euclidean E^n . Elementary geometry of E^n . Basic topological notions in E^n . Convex sets. — *Elementary topology of E^n* : Functions. Limits and continuity of transformations. Sequences in E^n . Bolzano-Weierstrass theorem. Relative neighborhoods, continuous transformations. Topological spaces. Connectedness. Compactness. Metric spaces. Spaces of continuous functions. Noneuclidean norms on E^n . — *Differentiation of real-valued functions*: Directional and partial derivatives. Linear functions. Differentiable functions. Functions of class $C^{(q)}$. Relative extrema. Convex and concave functions. — *Vector-valued functions of several variables*: Linear transformations. Affine transformations. Differentiable transformations. Composition. The inverse function theorem. The implicit function theorem. Manifolds. The multiplier rule. — *Integration*: Intervals. Measure. Integrals over E^n . Integrals over bounded sets. Iterated integrals. Integrals of continuous functions. Change of measure under affine transformations. Transformation of integrals. Coordinate systems in E^n . Measurable sets and functions; further properties. Integrals: general definition, convergence theorems. Differentiation under the integral sign. L^p -spaces. — *Curves and line integrals*: Derivatives. Curves in E^n . Differential l -forms. Line integrals. Gradient method. Integrating factors: thermal systems. — *Exterior algebra and differential calculus*: Covectors and differential forms of degree 2. Alternating multilinear functions. Multicovectors. Differential forms. Multivectors. Induced linear transformations. Transformation law for differential forms. The adjoint and codifferential. Special results for $n = 3$. Integrating factors. — *Integration on manifolds*: Regular transformations. Coordinate systems on manifolds. Measure and integration on manifolds. The divergence theorem. Fluid flow. Orientations. Integrals of r -forms. Stokes's formula. Regular transformations on submanifolds. Closed and exact differential forms. Motion of a particle. Motion of several particles. — Appendices.

M. LOEVE. — **Probability theory I.** — 4th edition. — Graduate texts in mathematics, vol. 45. — Un vol. relié, 16,5 × 24, de xvii, 425 p. — Prix: DM 45.00. — Springer Verlag, New York, Heidelberg/Berlin, 1977.

Elementary probability theory: Intuitive background. Axioms; independence and the Bernoulli case. Dependence and chains. — *Sets, spaces, and measures*: Sets, classes and functions. Topological spaces. Additive set functions. Construction of measures on σ -fields. — *Measurable functions and integration*: Measurable functions. Measure and convergences. Integration. Indefinite integrals; iterated integrals. — *Probability concepts*: Probability spaces and random variables. Probability distributions. — *Distribution functions and characteristic functions*: Distribution functions. Convergence of probabilities on metric spaces. Characteristic functions and distribution functions. Probability laws and types of laws. Nonnegative-definiteness; regularity. — *Sums of independent random variables*: Concept of independence. Convergence and stability of sums; centering at expectations and truncation. Convergence and stability of sums; centering at medians and symmetrization. Exponential bounds and normed sums. — *Central limit problem*: Degenerate, normal, and Poisson types. Evolution of the problem. Central limit problem; the case of bounded variances. Solution of the central limit problem. Normed sums. — *Independent identically distributed summands*: Regular variation and domains of attraction. Random walk.

J. L. BELL and M. MACHOVER. — **A course in mathematical logic.** — Un vol. relié, 16 × 23, de xviii, 599 p. — Prix: DFL 50.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Beginning mathematical logic: General considerations. Structures and formal languages. Higher-order languages. Basic syntax. Notational conventions. Propositional semantics. Propositional tableaux. The Elimination theorem for propositional tableaux. Completeness of propositional tableaux. The propositional calculus. The propositional calculus and tableaux. Weak completeness of the propositional calculus. Strong completeness of the propositional calculus. Propositional logic based on \neg and \wedge . Propositional logic based on \neg , \rightarrow , \wedge and \vee . Historical and bibliographical remarks. — *First-order logic*: First-order semantics. Freedom and bondage. Substitution. First-order tableaux. Some “book-keeping” lemmas. The Elimination theorem for first-order tableaux. Hintikka sets. Completeness of first-order tableaux. Prenex and Skolem forms. Elimination of function symbols. Elimination of equality. Relativization. Virtual terms. Historical and bibliographical remarks. — *First-order logic (continued)*: The first-order predicate calculus. The first-order predicate calculus and tableaux. Completeness of the first-order predicate calculus. First-order logic based on \exists . What have we achieved? Historical and bibliographical remarks. — *Boolean algebras*: Lattices. Boolean algebras. Filters and homomorphisms. The Stone representation theorem. Atoms. Duality for homomorphisms and continuous mappings. The Rasiowa-Sikorski theorem. Historical and bibliographical remarks. — *Model theory*: Basic ideas of model theory. The Löwenheim-Skolem theorems. Ultraproducts. Completeness and categoricity. Lindenbaum algebras. Element types and \aleph_0 -categoricity. Indiscernibles and models with automorphisms. Historical and bibliographical remarks. — *Recursion theory*: Basic notation and terminology. Algorithmic functions and functionals. The computer URIM. Computable functionals and functions. Recursive functionals and functions. A stockpile of examples. Church’s thesis. Recursiveness of computable functionals. Functionals with several sequence arguments. Fundamental theorems. Recursively enumerable sets. Diophantine relations. The Fibonacci sequence. The power function. Bounded universal qualification. The MRDP theorem and Hilbert’s tenth problem. Historical and bibliographical remarks. — *Limitative*

results : General notations and terminology. Nonstandard models of Ω . Arithmeticity. Tarski's theorem. Axiomatic theories. Baby arithmetic. Junior arithmetic. A finitely axiomatized theory. First-order Peano arithmetic. Undecidability. Incompleteness. Historical and bibliographical remarks. — *Recursion theory (continued)* : The arithmetical hierarchy. A result concerning $T\Omega$. Encoded theories. Inseparable pairs of sets. Productive and creative sets; reducibility. One-one reducibility; recursive isomorphism. Turing degrees. Post's problem and its solution. Historical and bibliographical remarks. — *Intuitionistic first-order logic* : Preliminary discussion. Philosophical remark. Constructive meaning of sentences. Constructive interpretations. Intuitionistic tableaux. Kripke's semantics. The Elimination Theorem for intuitionistic tableaux. Intuitionistic propositional calculus. Intuitionistic predicate calculus. Completeness. Translations from classical to intuitionistic logic. The interpolation theorem. Some results in classical logic. Historical and bibliographical remarks. — *Axiomatic set theory* : Basic developments. Ordinals. The axiom of regularity. Cardinality and the axiom of choice. Reflection principles. The formalization of satisfaction. Absoluteness. Constructible sets. The consistency of AC and GCH. Problems. Historical and bibliographical remarks. — *Nonstandard analysis* : Enlargements. Zermelo structures and their enlargements. Filters and monads. Topology. Topological groups. The real numbers. A methodological discussion. Historical and bibliographical remarks.

Z. A. MELZAK. — **Mathematical ideas, modeling and applications**. — Vol. 2 of « Companion to concrete mathematics ». — Pure and applied mathematics. — Un vol. relié, 16 × 24, de xvi, 413 p. — Prix: £21.75. — John Wiley and Sons, New York/London/Sydney/Toronto, 1976.

Further topics in geometry : Elementary geometry and trigonometry. Generating solid shapes. Linkages and other analog mechanisms. Poles, polars, and polar reciprocity. Natural equations and intrinsic geometry. Deformations and rigidity. Spherical trigonometry. Conditions and degrees of freedom. — *Analysis* : Inequalities. Differential equations and summation of series. Discontinuous factors, random walks, and hypercubes. Calculus of variations. Vector, matrix, and other generalizations. Continuity and smoothness. Generalized functions. — *Topics in combinatorics, number theory and algebra* : Hilbert matrices and Cauchy determinants. Multiplicative Diophantine equations. Gaussian binomial coefficients and other q -analogs. Some informal principles of combinatorics. Möbius inversion. The Lindelöf hypothesis. — *An approach to computing and computability* : Descent of computers from the weaving machinery. Theories of computing. Computing based on counting on one's fingers. Program modification. Examples of programs. Numerical, mathematical, and metamathematical levels. What computers can and cannot do. Programs acting on programs. Solvability of a restricted halting problem. — *Topics in applications* : Elliptic integrals and elliptic functions. Transport equations. Branching. Pursuit and related topics. Generalizations of Steiner's problem. — *Functional equations and mathematical modeling* : Certain types of functional equations. Derivation of certain simple functional equations. Geodesic focusing and the Mosevich functional equation. The Hartline-Ratliff equations and pattern perception. — *Appendix* : Informal treatment of certain mathematical principles: Complexity stratification. Conjugacy. Jacobi inversion. Structure. Computing one thing in two different ways. Extremization principles. Parity counting. Reducing multiplication to squaring. Generalizations.

William E. BOYCE and Richard C. DIPRIMA. — **Elementary differential equations and boundary value problems**. — 3d edition. — Un vol. relié, 18 × 24, de xiv, 582 p. — Prix: £12.50. — John Wiley and Sons, New York/Santa Barbara/London/Sydney/Toronto, 1977.

Introduction : Ordinary differential equations. Historical remarks. — *First order differential equations* : Linear equations. Further discussion of linear equations. Nonlinear equations. Separable equations. Exact equations. Integrating factors. Homogeneous equations. Miscellaneous problems. Applications of first order equations. Elementary mechanics. The existence and uniqueness theorem. Appendix. — *Second order linear equations* : Introduction. Fundamental solutions of the homogeneous equation. Linear independence. Reduction of order. Homogeneous equations with constant coefficients. Complex roots. The nonhomogeneous problem. The method of undetermined coefficients. The method of variation of parameters. Mechanical vibrations. Free vibrations. Forced vibrations. Electrical networks. — *Series solutions of second order linear equations* : Introduction. Review of power series. Series solutions near an ordinary point, part 1 and 2. Regular singular points. Euler equations. Series solutions near a regular singular point, parts 1 and 2. Series solutions near a regular singular point; $r_1 = r_2$ and $r_1 - r_2 = N$. Bessel's equation. — *Higher order linear equations* : Introduction. General theory of n th order linear equations. Homogeneous equations with constant coefficients. The method of undetermined coefficients. The method of variation of parameters. — *The Laplace transform* : Introduction. Definition of the Laplace transform. Solution of initial value problems. Step functions. A differential equation with a discontinuous forcing function. Impulse functions. The convolution integral. General discussion and summary. — *Systems of first order linear equations* : Introduction. Solution of linear systems by elimination. Review of matrices. Systems of linear algebraic equations; linear interdependence, eigenvalues, eigenvectors. Basic theory of systems of first order linear equations. Homogeneous linear systems with constant coefficients. Complex eigenvalues. Repeated eigenvalues. Fundamental matrices. Nonhomogeneous linear systems. — *Numerical methods* : Introduction. The Euler or tangent line method. The error. An improved Euler method. The three-term Taylor series method. The Runge-Kutta method. Some difficulties with numerical methods. A multistep method. Systems of first order equations. — *Nonlinear differential equations and stability* : Introduction. Solutions of autonomous systems. The phase plane; linear systems. Stability; almost linear systems. Competing species and predator-prey problems. Liapounov's second method. Periodic solutions and limit cycles. — *Partial differential equations and Fourier series* : Introduction. Heat conduction and separation of variables. Fourier series. The Fourier theorem. Even and odd functions. Solution of other heat conduction problems. The wave equation; vibrations of an elastic string. Laplace's equation. — *Boundary value problems and Sturm-Liouville theory* : Linear homogeneous boundary value problems; eigenvalues and eigenfunctions. Sturm-Liouville boundary value problems. Nonhomogeneous boundary value problems. Singular Sturm-Liouville problems. Further remarks on the method of separation of variables; a Bessel series expansion. Series of orthogonal functions; mean convergence.

Edward BECKENSTEIN; Lawrence NARICI and Charles SUFFEL. — **Topological algebras**. — North-Holland mathematics studies, vol. 24. — Notas de matematica, vol. 60. — Un vol. broché, 17 × 24, de xii, 370 p. — Prix: DFL 60.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Fundamentals : Topologies defined by families of functions. Uniformities defined by families of functions. — *Algebras of continuous functions* : The Stone-Cech compactification. Zero sets. Maximal ideals and z -filters. Maximal ideals and the Stone-Cech, compactification. Replete spaces. Characters and vT . 0-1 measures, βT , and Ulam cardinals. Shirota's theorem on repleteness. — *Topological vector spaces of continuous functions* : Metrizability of $C(T, F, c)$ and hemicompactness. Completeness and k_R -spaces.

k -spaces, k_R -spaces and pseudofinite spaces. Continuous dual of $C(T, \mathbf{F}, c)$ and support. Barreledness of $C(T, \mathbf{F}, c)$. Bornologicity of $C(T, \mathbf{F}, c)$. Separability of $C(T, \mathbf{F}, c)$. The bornology of $C(T, \mathbf{F}, c)$. — *Lattices and Wallman compactifications*: Lattices. Lattices and associated compactifications. Wallman compactifications of topological spaces. βT and Wallman compactifications. A class of Wallman-type compactifications. Equivalent Wallman spaces. — *Topological algebras*: Topological algebras. Multiplicative sets and multiplicative seminorms. Locally m -convex algebras. Final topologies and quotients. The factor algebras. Complete IMCH algebras and projective limits. The spectrum. Q -algebras and algebras with continuous inverse. Topological division algebras and the Gelfand-Mazur theorem. Maximal ideals and homomorphisms. The radical and derivations. Some elements of Gelfand theory. Continuity of homomorphisms. — *Hull-kernel topologies*: Hull-kernel topologies. Regular algebras and normality conditions. Condition hH . μ as a Wallman compactification of μ_c . The X -repletion of μ_c . Frechet algebras. — *LB-algebras*: LB-algebras. Some properties of LB-algebras. Complete LMC LB-algebras.

C. GRUBER; A. HINTERMANN and D. MERLINI. — **Group analysis of classical lattice systems**. — Lecture Notes in physics, vol. 60. — Un vol. broché, 16,5 × 24, de xiv, 326 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Spin $\frac{1}{2}$ lattice systems without constraints: Definitions and group structure. The duality transformation. Duality relation for the correlation functions. Phase transitions with spontaneous symmetry breakdown. Ergodic decomposition. Series and cluster expansion, an application of universality hypothesis, a “generalized” droplet model. The partial trace transformation, equation for the correlation functions and representation of the symmetry group. Invariant equilibrium states and duality transformation for infinite systems. Asano contraction and group structure, analyticity properties of the free energy. Analyticity and uniqueness of the invariant equilibrium state. — *Spin $\frac{1}{2}$ lattice systems with constraints*: Definitions and group structure for systems with constraints. Expansions for the partition function. Partial trace method and equilibrium equations. Duality transformation restricted to finite bonds. Asano contractions and unicity of state. — *Arbitrary spin lattice systems*: General framework of higher spin systems. Physical implications of the group structure. Spin 1 lattice systems. The duality transformation. Zeroes of the partition function.

Helmut BRASS. — **Quadraturverfahren**. — Studia mathematica, vol. 3. — Un vol. broché, 16 × 23,5, de 311 p. — Prix: DM 35.00. — Vandenhoeck and Ruprecht, Göttingen/Zürich, 1977.

Grundlagen: Grundlegende Definitionen. Beurteilungsprinzipien für Quadraturverfahren. Interpolationsquadraturen. Zusammengesetzte Quadraturverfahren. Optimale Quadraturverfahren. Andere Konstruktionsprinzipien. Konvergenztheorie. Konvergenztheorie bei positiven Verfahren. — *Restabschätzungen*: Peanos Restglieddarstellung. Eine Entwicklung des Restes. Bernoullische Polynome. Definite Funktionale. Varianten der Restentwicklung. Abschätzungen durch Paare von Quadraturformeln mit definitem Rest. Die Methode von Davis. Abschätzungen mit den Mitteln der Funktionentheorie. Ein allgemeines Prinzip zur Verbesserung von Abschätzungen. — *Interpolationsquadaturen*: Elementare Bemerkungen über symmetrische Quadraturformeln. Theorie der Orthogonalpolynome. Tschebyscheff-Polynome und verwandte Orthogonalpolynomsysteme. Legendre-Polynome. Polynome im Kern von R_n . Positivität der Gewichte.

Konvergenz von Interpolations-Quadraturverfahren in der Klasse der stetigen Funktionen. Konvergenzuntersuchungen in anderen Funktionenklassen. Auf Interpolationstheorie gegründete Restaussagen. — *Spezielle Interpolationsquadraturen*: Übersicht. Gewichte der Verfahren von Newton-Cotes-Typ. Der Rest der Formeln vom Newton-Cotes-Typ. Konvergenz und Divergenz bei den Verfahren vom Newton-Cotes-Typ. Die Gewichte der Verfahren vom Polyaschen Typ. Der Rest der Formeln vom Polyaschen Typ. Grundlegende Tatsachen über die Verfahren vom Gauss'schen Typ. Weitere Fehlerabschätzungen und Fehlerasymptotik beim Gauss-Verfahren. Die Tschebyscheffschen Quadraturformeln. — *Zusammengesetzte Quadraturverfahren*: Fehlerabschätzungen für zusammengesetzte Quadraturverfahren. Trapez- und Mittelpunktverfahren. Das Simpson-Verfahren. Die Abschätzungsmethode von Davis/Hämmerlin. Elimination von Restgliedanteilen durch Linearkombination. Das Romberg-Verfahren. Randkorrekturen bei zusammengesetzten Quadraturverfahren. Die Gregory-Verfahren. Andere Quadraturverfahren mit Randkorrekturen. — *Integration periodischer Funktionen über ein Periodenintervall*.: Vorbemerkung. Fehlerabschätzungen zum Trapezverfahren. Zusammenhang mit der trigonometrischen Approximation. Anwendung der Davis'schen Methode. Umkehrsätze. — *Optimale Quadraturverfahren*: Ein Beispiel. Optimale Quadraturformeln und Spline-Funktionen. Die Formeln von Sard. Die Verfahren von Schoenberg/Karlin. Optimale Quadraturformeln in der Klasse $\{f \mid M_r[f] \leq 1\}$. Hilbertraum-Methoden in der Optimalitätstheorie. Anwendung auf spezielle Hilberträume. Optimale Formeln mit definiten Rest. Schlussbemerkung.

Warren BRISLEY. — **Grundbegriffe der linearen Algebra**. — Aus dem Englischen übers. von Rudolf J. Taschner. — Moderne Mathematik in elementarer Darstellung, Bd 16. — Un vol. broché, 15,5 × 23,5, de 257 p. — Prix: DM 32.00. — Vandenhoeck and Ruprecht, Göttingen, 1977.

Bemerkungen über Definitionen, Postulate, Sätze und Beweise. — Einige mathematische Objekte: Matrizen und das Rechnen mit Matrizen. „Endliche Arithmetik“ (Rechnen mit Restklassen). Die komplexen Zahlen. Funktionen, Abbildungen und Permutationen. Aufgaben. — *Axiomatisch definierte Systeme: Gruppen, Ringe und Körper*: Abgekürzte Bezeichnungen. Isomorphismen algebraischer Systeme. Aufgaben. — *Vektorräume*: Elementare Begriffe und Beispiele. Dimension, lineare Abhängigkeit und Unabhängigkeit, Basis. Unterräume. Drei einfache Sätze über die Dimension. Erweiterungen und Einschränkungen auf eine Basis. Aufgaben. — *Homomorphismen von Vektorräumen*: Definition und Beispiele. Kern und Bild. Die Entsprechung zwischen Homomorphismen und Matrizen. Aufgaben. — *Determinante und Inverse von Matrizen*: Problemstellung. Ansätze zu einer Lösung für den allgemeinen Fall. Eigenschaften und Existenz der Determinante. Algorithmen zur Berechnung der Determinante. Die Lösung des Problems. Aufgaben. — *Anwendungen und Ergänzungen zum Begriff des Vektorraumes*: Anwendung der Begriffe „Kern“ und „Bild“. Eine Anwendung in einem fremden Gebiet: Einfache lineare Differentialgleichungen und die Bedeutung von „Kern“ und „Bild“. Eigenvektoren und Eigenwerte einer Matrix. Der Vorzug des C^n gegenüber dem R^n . Geometrie: Die Begriffe „Länge“ und „Orthogonalität“. Koordinatentransformationen in der Ebene. Die allgemeine Gleichung zweiten Grades. Aufgaben. — *Anhang*: Äquivalenzrelationen, Äquivalenzklassen und Kongruenzen. Vollständige Induktion. Gleichungen mit zu vielen Unbekannten. Berechnung der Inversen einer Matrix. Andere Definitionen der „Determinante“. Gerade und ungerade Permutationen; symmetrische und alternierende Gruppen. $N \rightarrow Z \rightarrow Q \rightarrow R - C$. Rechnen mit komplexen Zahlen. Einiges über Kegelschnitte. Schreibweise der symbolischen Logik. Katalog einiger algebraischer Strukturen. Lösungen der Aufgaben.

Gérard RAUZY. — **Propriétés statistiques de suites arithmétiques.** — Collection SUP: « Le mathématicien », n° 15. — Un vol. broché, $13,5 \times 21$, de 133 p. — Paris: Presses universitaires de France, 1976.

Répartition. Exemples: Répartition de la suite $(n\alpha)$. Equirépartition. Critères d'équidistribution. Généralisation. Répartition selon une mesure. Répartition dans un ensemble fini. Répartition complète. Remarques sur la notion de répartition complète. Quelques exemples. — *Applications du critère de Weyl*: Critères de Fejér. Critère de Van der Corput. Fonctions de corrélation. Fonctions pseudo-aléatoires. Fonctions g -additives. — *Suites à croissance rapide*: Suites lacunaires. Non-equirépartition des suites exponentielles. Théorèmes métriques. Nombres normaux. — *Indépendance*: Mesures associées à une suite. Clôture d'un ensemble de suites. Existence de suites dans un espace donné. Indépendance. Suites extraites. Applications: suites à caractère presque périodique. — *Suites obtenues par itération*: Définitions. Théorème ergodique. Applications. Points génériques de transformation ergodiques. Points génériques pour des transformations non-ergodiques. Transformations conservant les points génériques. Notions d'isomorphisme.

A. I. ARRUDA, N. C. A. da COSTA, R. CHUAQUI, eds. — **Non-classical logics, model theory, and computability.** — Proceedings of the third Latin-American symposium on mathematical logic, Campinas, Brazil, July 11-17, 1976. — Studies in logic and the foundations of mathematics, vol. 89. — Un vol. relié, 16×23 , de xviii, 307 p. — Prix: DFL 70.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Non classical logics: A. I. Arruda : On the imaginary logic of N. A. Vasil'ev. F. G. Asenjo : Formalizing multiple location. N. C. A. da Costa, L. Dubikajtis : On Jaskowski's discussive logic. J. Kotas, N. C. A. da Costa : On some modal logical systems defined in connection with Jaskowski's problem. E. G. K. Lopez-Escobar : Infinite rules in finite systems. L. H. Lopes dos Santos : Some remarks on discussive logic. — *Model theory*: M. Benda : Some directions in model theory. R. B. Chuaqui : A semantical definition of probability. L. P. de Alcantara : The equivalence of some axioms of strong infinity. R. Fraïssé : Present problems about intervals in relation-theory and logic. R. Morais : Projective logics and projective Boolean algebras. C. C. Pinter : Some theorems on omitting types, with applications to model completeness, amalgamation, and related properties. A. R. Raggio : Semi-formal Beth tableaux. J. R. Shoenfield : Quantifier elimination in fields. — *Computability*: H. P. Sankappanavar : On the decision problem of the congruence lattices of pseudocomplemented semilattices. J. Simon : Polynomially bounded quantification over higher types and a new hierarchy of the elementary sets. R. M. Solovay : On random R. E. sets.

Edwin E. MOISE. — **Geometric topology in dimensions 2 and 3.** — Graduate texts in mathematics, vol. 47. — Un vol. relié, 16×24 , de x, 262 p. — Prix: DM 45.00. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Introduction. — Connectivity. — Separation properties of polygons in \mathbb{R}^2 . — The Schönflies theorem for polygons in \mathbb{R}^2 . — The Jordan curve theorem. — Piecewise linear homeomorphisms. — PL approximations of homeomorphisms. — Abstract complexes and PL complexes. — The triangulation theorem for 2-manifolds. — The Schönflies theorem. — Tame imbedding in \mathbb{R}^2 . — Isotopies. — Homeomorphisms between Cantor sets. — Totally disconnected compact sets in \mathbb{R}^2 . — The fundamental group (summary). —

The group of (the complement of) a link. — Computations of fundamental groups. — The *PL* Schönflies theorem in \mathbb{R}^2 . — The Antoine set. — A wild arc with a simply connected complement. — A wild 2-sphere with a simply connected complement. — The Euler characteristic. — The classification of compact connected 2-manifolds. — Triangulated 3-manifolds. — Covering spaces. — The Stallings proof of the loop theorem of Papakyriakopoulos. — Bicollar neighborhoods; an extension of the loop theorem. — The Dehn lemma. — Polygons in the boundary of a combinatorial solid torus. — Limits on the loop theorem: Stalling's example. — Polyhedral interpolation theorems. — Canonical configurations. — Handle decompositions of tubes. — *PLH* approximations of homeomorphisms, for regular neighborhoods of linear graphs in R^3 . — *PLH* approximations of homeomorphisms, for polyhedral 3-cells. — The triangulation theorem. — The „Hauptvermutung“; tame imbedding. — Bibliography.

Otto FORSTER. — **Riemannsche Flächen.** — Heidelberger Taschenbücher, Band 184. — Un vol. broché, 14 × 21, de x, 223 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Überlagerungen: Definition der Riemannsche Flächen. Einfache Eigenschaften holomorpher Abbildungen. Homotopie von Kurven. Fundamentalgruppe. Verzweigte und unverzweigte Überlagerungen. Universelle Überlagerung, Decktransformationen. Garben. Analytische Fortsetzung. Algebraische Funktionen. Differentialformen. Integration von Differentialformen. Lineare Differentialgleichungen. — *Kompakte Riemannsche Flächen*: Cohomologiegruppen. Das Dolbeaultsche Lemma. Ein Endlichkeitsatz. Die exakte Cohomologiesequenz. Der Satz von Riemann-Roch. Der Serresche Dualitätssatz. Funktionen und Differentialformen zu vorgegebenen Hauptteilen. Harmonische Differentialformen. Das Abelsche Theorem. Das Jacobische Umkehrproblem. — *Nicht-kompakte Riemannsche Flächen*: Das Dirilechtsche Randwertproblem. Abzählbarkeit der Topologie. Das Weylsche Lemma. Der Rungesche Approximationssatz. Die Sätze von Mittag-Leffler und Weierstrass. Der Riemannsche Abbildungssatz. Funktionen zu vorgegebenen Automorphiesummanden. Geraden- und Vektorraumbündel. Trivialität von Vektorraumbündeln. Das Riemann-Hilbertsche Problem. — *Anhang*: Teilungen der Eins. Topologische Vektorräume.

Multivariate analysis IV. — Proceedings of the 4th international symposium on multivariate analysis. — Ed. by Paruchuri R. Krishnaiah. — Un vol. relié, 16 × 23, de XIII, 549 p. — Prix: DFL 125.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Multivariate distribution theory: R. C. Bose : Early history of multivariate statistical analysis. — A. Dvoretzky : Asymptotic normality of sums of dependent random vectors. — D. A. S. Fraser and K. W. Ng : Inference for the multivariate regression model. — Y. Fujikoshi : Asymptotic expansions for the distributions of some multivariate tests. — A. T. James : Tests for a prescribed subspace of principal components. — C. G. Khatri : Quadratic forms and extension of Cochran's theorem to normal vector variables. — P. R. Krishnaiah and J. C. Lee : Inference on the eigenvalues of the covariance matrices of real and complex multivariate normal populations. — J. C. Lee, T. C. Chang and P. C. Krishnaiah : Approximations to the distributions of the likelihood ratio statistics for testing certain structures on the covariance matrices of real multivariate normal populations. — E. Lukacs : A characterization of a bivariate gamma distribution. — C. McHenry and A. M. Kshirsagar : Use of Hotelling's generalized T_0^2 in multivariate

tests. — *Estimation, decision procedures and design of experiments* : J. Kiefer : Conditional confidence and estimated confidence in multidecision problems (with applications to selection and ranking). — P. A. W. Lewis, L. H. Liu, D. W. Robinson and M. Rosenblatt : Empirical sampling study of a goodness of fit statistic for density function estimation. — I. Olkin and M. Sylvan : Correlational analysis when some variances and covariances are known. — C. R. Rao : Prediction of future observations with special reference to linear models. — S. Zacks : Problems and approaches in design of experiments for estimation and testing in nonlinear models. — *Time series and stochastic processes* : R. E. Barlow and F. Proschan : Asymptotic theory of total time on test processes with applications to life testing. — T. Hida : Topics on nonlinear filtering theory. — M. Hitsuda and H. Watanabe : On a causal and causally invertible representation of equivalent Gaussian processes. — G. Kallianpur : A stochastic equation for the optimal non-linear filter. — E. Parzen : Multiple time series: determining the order of approximating autoregressive schemes. — B. S. Rajput and N. N. Vakhania : On the support of Gaussian probability measures on locally convex topological vector spaces. — M. M. Rao : Inference in stochastic processes VI: translates and densities. — V. A. Statulevicius : Application of semi-invariants to asymptotic analysis of distributions of random processes. — *Information and control theory* : A. V. Balakrishnan : Stochastic control of systems governed by partial differential equations. — F. J. Beuler, B. Melamed and B. P. Zeigler : Equilibrium properties of arbitrarily interconnected queueing networks. — C. W. Helstrom : An introduction to quantum estimation theory. — T. Kailath and L. L. Jung : A scattering theory framework for fast least-squares algorithms. — D. Middleton : A new approach to scattering problems in random media. — Y. A. Rozanov : Some system approaches to water resources problems III: optimal control of dam storage. — *Contingency tables, directional data statistics, and pattern recognition* : H. Chernoff : Some applications of a method of identifying an element of a large multidimensional population. — S. Das Gupta : Some problems in statistical pattern recognition. — R. H. Jones : Multivariate statistical problems in meteorology. — M. Kendall : Multivariate contingency tables and some further problems in multivariate analysis. — K. V. Mardia : Mahalanobis distances and angles. — M. L. Puri and J. S. Rao : Problems of association for bivariate circular data and a new test of independence. — M. Siotani and R.-H. Wang : Asymptotic expansions for error rates and comparison of the *W*-procedure and the *Z*-procedure in discriminant analysis.

Serge COLOMBO. — **Les équations aux dérivées partielles en physique et en mécanique des milieux continus.** — Un vol. relié, 17 × 25, de VIII, 188 p. — Prix: FS 57.50. — Masson: Paris/New York/Barcelone, Milan, 1976 (distr. en Suisse par CRISPA, S.A., Fribourg).

Considérations générales sur les équations aux dérivées partielles : Introduction. Notion d'analyticité. Sur quelques caractères généraux des solutions des équations aux dérivées partielles. Conditions aux frontières. Systèmes normaux. Théorème d'existence et d'unicité. Le problème de Cauchy. Solutions généralisées. Transformation de Legendre. — *Modèles mathématiques utilisés en mécanique et en physique* : Introduction. Phénomènes vibratoires. Mécanique des milieux continus. Théorie de l'élasticité. Electromagnétisme. Les équations de Maxwell. Ondes acoustiques. Equations des télégraphistes. — *Equations du premier ordre* : Cône de Monge. Equations quasi-linéaires. Courbes caractéristiques et surfaces intégrales. Problème de Cauchy dans le cas des équations quasi-linéaires. Equations du premier ordre. Cas général. — *Equations du second ordre* : Introduction. Classification des équations du second ordre. Classification des équations dans le cas de deux variables indépendantes. Equations de type mixte. Courbes caractéristiques et problème de Cauchy dans le cas de l'équation quasi-linéaire à deux variables. Autres propriétés des courbes caractéristiques. Cas de l'équation générale du second ordre. — *Equations hyperboliques*.

Propagation d'ondes: Equations des cordes vibrantes. Solution de d'Alembert. Corde vibrante. Analyse de Fourier. L'équation des ondes. Principe de Huyghens. Propagation en milieu dispersif. Résolution de l'équation hyperbolique linéaire par la méthode des approximations successives. Aperçus complémentaires sur le rôle des caractéristiques. Méthode de Riemann. — *Potentiels newtoniens. Equation de Laplace*: Fonctions harmoniques. Deux théorèmes fondamentaux sur les fonctions harmoniques. Problème de Dirichlet. Fonctions harmoniques et représentation conforme. Résolution des problèmes de Dirichlet et de Neumann. Problème de Neumann. Méthode de séparation des variables. Equation de Helmholtz. — *L'équation de diffusion*: L'équation de diffusion de la chaleur. Le problème du « mur » de Fourier. Cas de la barre infinie. Transformées de Laplace.

Franklin A. GRAYBILL. — *Theory and application of the linear model*. — Un vol. relié, 17 × 24, de xiv, 704 p. — Prix: DFL 69.90. — Duxbury Press, North Scituate, Mass., 1976.

Mathematical concepts: Elementary theorems on linear and matrix algebra. Partitioned matrices. Nonnegative matrices. Generalized and conditional inverses. Solutions of linear equations. Idempotent matrices. Trace of matrices. Derivatives of quadratic and linear forms; expectation of a matrix. Evaluation of an integral. — *Statistical concepts*: Random variables and distribution functions. Moment generating function. Independence of random vectors. Special distributions and some important formulas. Statistical inference. Point estimation. Hypothesis testing. Confidence intervals. Comments on statistical inference. — *The multidimensional normal distribution*: The univariate normal distribution. Multivariate normal distribution. Marginal distributions. Independent and uncorrelated random vectors. Conditional distribution. Regression. Correlation. — *Distributions of quadratic forms*: Noncentral chi-square distribution. Noncentral F and noncentral t distributions. Distribution of quadratic forms in normal variables. Independence of linear forms and quadratic forms. Expected value of a quadratic form. Additional theorems. — *Models*: General linear model. Linear regression model. Design models. Components-of-variance-model. — *General linear model*: Point estimation of σ^2 and linear functions of β_i : case 1. Test of the hypothesis $H\beta = h$: case 1. Special cases for hypothesis testing. Confidence intervals associated with the test $H_0: H\beta = h$. Further discussion of confidence intervals associated with the test. $H_0: H\beta = h$. Example. The general linear model, case 1, and $\Sigma \neq \sigma^2 I$. Examination of assumptions. Inference in the linear model: case 2. Further discussion of the test $H\beta = h$. Problems. — *Computing techniques*: Square root method of factoring a positive definite matrix. Computing point estimates, test statistics, and confidence intervals. Analysis of variance. The normal equations using deviations from means. Some computing procedures when $\text{cov}[Y] = \sigma^2 V$. — *Applications of the general linear model*: Prediction intervals. Tolerance intervals. Other tolerance and associated intervals. Determining x for a given value of Y (the calibration problem). Parallel, intersecting, and identical models. Polynomial models. Trigonometric models: Designing investigations. Maximum or minimum of a quadratic function. Point of intersection of two lines. Problems. — *Sampling from the multivariate normal distribution*: Notation. Point estimators of μ and Σ . Test of the hypothesis $H_0: \mu = h_0$. Confidence intervals on $l'_i \mu$, for $i = 1, 2, \dots, q$. Computations. Additional theorems about $\hat{\mu}$ and $\hat{\Sigma}$. Problems. — *Multiple regression*: Multiple regression model: case I, case II, and point estimation. Multiple regression model: confidence intervals and tests of hypotheses, case I and case II. Multiple regression model: case III. Problems. — *Correlation*: Simple correlation. Partial correlation. Multiple correlation. Correlation for non-normal p.d.f.'s. Correlation and independence of random variables. Problems. — *Some applications of the regression model*: Prediction. Selecting variables for a model. Growth curves. Dis-

crimination (classification). Problems. — *Design models* : Point estimation for the design model; case I. Point estimation for the design model; case II. Confidence intervals and tests of hypotheses for case I of the design model. Computations. The one-factor design model. Futher discussion of tests and confidence intervals for design models. Problems. — *Two-factor design model* : Two-factor design model, no interaction, one observation per cell. Two-factor design model, no interaction, $M > 1$ observations per cell. Two-factor design model, no interaction, unequal numbers of observations in cells. Interaction in the two-factor design model. Two-factor design model with interaction and $M > 1$ obser-vations per cell. Two-factor design model with interaction and with $M = 1$. Two-factor model with interaction and unequal number of observations in the cells. Some situations described by two-factor design models. Balanced incomplete block models. Test for interaction. Problems. — *Components-of-variance models* : One-factor components-of-variance model; point estimation. A general components-of-variance model. Two-factor components-of-variance model. Other components-of-variance models. Additional results on components-of-variance models. Proof of theorem. Problems. — Tables.

H. Jerome KEISLER. — **Elementary calculus.** — Un vol. relié, 19 × 26, de xviii, 880 p. + 59 p. de solutions aux problèmes. — Prindle, Weber and Schmidt, Boston, Mass., 1976.

The real and hyperreal numbers : Real numbers. Rectangular coordinates. Second degree curves. Slope and velocity, the hyperreal line. Infinitesimal, finite, and infinite numbers. Standard parts. Functions of real numbers. Equations and inequalities, independent and dependent variables. Hyperreal functions. — *Differentiation* : Derivatives. Differentials and tangent lines. Derivatives of rational functions. Inverse functions. Chain rule. Higher derivatives and implicit functions. Related rates. Transcendental functions (an alternate text). — *Continuous functions* : Limits. Continuity. Partitions of an interval. Zeros of continuous functions. Maxima and minima. Maxima and minima — applications. Tests for maxima and minima. Mean value theorem. Derivatives and curve sketching. — *Integration* : Area functions. The definite integral. Properties of definite integrals. Uniqueness of the area function. Fundamental theorem of calculus. Indefinite integrals. Integration by change of variables. Second fundamental theorem of calculus. — *Limits and approximations* : Infinite limits. L'Hospital's rule. Limits and curve sketching. The ε, δ condition for limits. Estimates of error. Derivatives and increments. Trapezoidal rule. — *Applications of the integral* : Area between two curves. Volumes of solids of revolution. Length of a curve. Area of a surface of revolution. Averages. Some appli-cations to physics. Improper integrals. — *Trigonometric functions* : Trigonometry. Deriva-tives of trigonometric functions. Inverse trigonometric functions. Integration by parts. Integrals of powers of trigonometric functions. Trigonometric substitutions. Polar coordinates. Slopes and curve sketching in polar coordinates. Area in polar coordinates. Length of a curve in polar coordinates. — *Exponential and logarithmic functions* : Ex-pontential functions. Logarithmic functions. Derivatives of exponential functions and the number e . Some uses of exponential functions. Natural logarithms. Some differential equations. Derivatives and integrals involving in x . Integration of rational functions. Methods of integration. — *Infinite series* : Sequences. Series. Properties of infinite sets. Series with positive terms. Alternating series. Absolute and conditional convergence. Power series. Derivatives and integrals of power series. Approximation by power series. Taylor's formula. Taylor series. — *Vectors* : Vector algebra. Vectors and plane geometry. Vectors and lines in space. Products of vectors. Planes in space. Vector valued functions. Vector derivatives. Hyperreal vectors. — *Partial differentiation* : Surfaces. Continuous functions of two or more variables. Partial derivatives. Total differentials and tangent

planes. Chain rule. Implicit functions. Maxima and minima. Higher partial derivatives. Directional derivatives and gradients. Line integrals. Independence of path. — *Multiple integrals* : Double integrals. Iterated integrals. Infinite sum theorem and volume. Applications to physics. Double integrals in polar coordinates. Triple integrals. Cylindrical and spherical coordinates. Green's theorem. Surface area and surface integrals. Theorems of Stokes and Gauss. — *Appendix : tables* : Trigonometric functions. Greek alphabet. Exponential functions. Natural logarithms. Powers and roots. — Answers to selected problems.

H. Jerome KEISLER. — **Foundations of infinitesimal calculus.** — Un vol. broché, 18 × 26, de ix, 214 p. — Prindle, Weber and Schmidt, Boston, Mass., 1976.

The hyperreal numbers : Structure of the hyperreal numbers. Axioms for the hyperreal numbers. Consequences of the solution axiom. Natural extensions of sets. A simple construction of the hyperreal numbers. Appendix: Algebra of the real numbers. — *Logic and superstructures* : The elementary extension principle. Superstructures. Standard, internal, and external sets. The ultrapower construction. Representation and uniqueness. — *Differentiation* : Derivatives. Infinitesimal microscopes and infinite telescopes. Properties of derivatives. Chain rule. — *Continuous functions* : Limits and continuity. Hyperintegers. Continuous functions on an interval. — *Integration* : The definite integral. Fundamental theorem of calculus. Second fundamental theorem of calculus. — *Limits* : Equivalence theorems. L'Hospital's rule. — *Applications of the integral* : Infinite sum theorem. Lengths of curves. Improper integrals. — *Trigonometric functions* : Inverse function theorem. Derivatives of trigonometric functions. Area in polar coordinates. — *Exponential functions* : Extending continuous functions. Definition and derivative of e^x . — *Infinite series* : Sequences. Series. Taylor's formula and higher differentials. — *Vectors* : Hyperreal vectors. Vector functions. — *Partial differentiation* : Continuity and partial derivatives. Chain rule and implicit functions. Maxima and minima. Second partial derivatives. Line integrals. — *Multiple integration* : Double integrals. Green's theorem. Infinite sum theorem for two variables. Change of variables in double integrals.

Peter HENRICI. — **Applied and computational complex analysis. Vol. p.** — Special functions, integral transforms, asymptotics, continued fractions. — Pure and applied mathematics, a Wiley-Interscience series of texts, monographs and tracts, — Un vol. relié, 17 × 24, de x, 662 p. — Prix: £24.40. — John Wiley and Sons, New York/London/Sydney/Toronto, 1977.

Infinite products : Definition and elementary properties. Some infinite products relevant to number theory. Product representations of entire functions. The gamma function. Stirling's formula. Some special series and products. The beta function. Integrals of the Mellin-Barnes type. Seminar assignments. Notes. — *Ordinary differential equations* : The existence theorem. Power series method. Linear systems. Linear systems with isolated singularities. Singularities of the first kind: formal solutions. Scalar equations of higher order: method of Frobenius. Two examples: the equations of Kummer and Bessel. The infinite point: equations of Fuchsian type. The hypergeometric differential equation. Quadratic transforms: Legendre functions. Singularities of the second kind: formal solutions. Singularities of the second kind of special second-order equations. Seminar assignments. Notes. — *Integral transforms* : Definition and basic properties of the \mathcal{L} transformation. Operational rules: basic correspondences. Ordinary differential equations: systems. Convolution. Some nonelementary correspondences. The Fourier integral.

The Laplace transform as a Fourier transform. Dirichlet series: prime number theorem. Functions of exponential type. The discrete Laplace transform. Some integral transforms related to the \mathcal{L} transform. Some applications to partial differential equations. Seminar assignments. Notes. — *Asymptotic methods*: An example: Asymptotic power series. The algebra of asymptotic power series. Analytic properties of asymptotic power series. Asymptotic solutions of differential equations. The Watson-Doetsch lemma. Extension of the lemma. Asymptotic formulas: Laplace's method. The method of steepest descent. General asymptotic expansions: asymptotic factorial series. Generating functions: subtracted singularities. The Euler-Maclaurin summation formula. The numerical evaluation of limits: Romberg's algorithm. Seminar assignments. Notes. — *Continued fractions*: Definition and basic properties. Continued fractions in number theory. Convergence of continued fractions with complex elements. RITZ fractions (formal theory): Padé table. The convergence of RITZ fractions: examples. The division algorithm: rational RITZ fractions. SITZ fractions: approximants, stable polynomials. S fractions: generalized value functions, convergence. S fractions: the representation of their generalized value functions by Stieltjes transforms. Positive symmetric functions and their representation as Stieltjes transforms. Existence and convergence of the S fraction corresponding to a Stieltjes transform. S fractions: expansions of Stieltjes transforms. S fractions: expansions of iterated Laplace transforms. Moment problems. Seminar assignments. Notes. — *Appendix*: Some additional problems on vol. 1.

Norman L. JOHNSON and Samuel KOTZ. — **Urn models and their application**: an approach to modern discrete probability theory. — Wiley series in probability and mathematical statistics. — Un vol. relié, 16 × 24, de xiii, 402 p. — Prix: £16.45. — John Wiley and Sons, New York/London/Sydney/Toronto, 1977.

Introductory background: basic concepts and methods: Some mathematical formulas. Background for urn models. Probability. Random variables. — *Some special distributions (mostly via urn models)*: Introduction. Binomial, normal, Poisson, gamma and beta distributions. Hypergeometric distributions. Negative binomial distributions. Negative hypergeometric distributions. Power series and factorial series distributions. Multivariate distributions. Mixture distributions. Exchangeable variates (J. Galambos). Appendix (J. Galambos). — *Occupancy and related problems*: Occupancy problems. Related occupancy distributions. Randomized occupancy models. Multivariate occupancy distributions. Sequential occupancy problems. Committee problems. — *Urn models with stochastic replacements*: Introduction. Pólya-Eggenberger distributions. Generalizations of Pólya-Eggenberger distributions. Inverse Pólya distributions. Multivariate Pólya distributions. Stagewise linkage. Randomized schemes. Urn transfer models. Appendix: Tables of Pólya-Eggenberger distribution. — *Applications*: Introduction. Applications in genetics (W. J. Ewens). Capture-recapture models. Application of urn models to learning processes. Miscellaneous applications. Sampling systems. Tests of empty boxes. Tolerance regions. Markov chains. A decision theory application. — *Limit distributions for urn models*: Introduction and summary. Occupancy distributions. Pólya-Eggenberger and related limit distributions. Limit laws for exchangeable variables (J. Galambos).

James V. BECK and Kenneth J. ARNOLD. — **Parameter estimation in engineering and science**. — Wiley series in probability and mathematical statistics. — Un vol. relié, 16 × 24, de xix, 501 p. — Prix: £18.75. — John Wiley and Sons, New York/London/Sydney/Toronto, 1977.

Introduction to and survey of parameter estimation: Introduction. Fundamental problems. Simple examples. Sensitivity coefficients. Identifiability. *Summary and con-*

clusions. References. Problems. — *Probability*: Random happenings. Events. Probability distributions. Conditional probabilities. Functions of random variables. Expectations. Law of large numbers. Central limit theorem. Examples of distributions. References. Problems. — *Introduction to statistics*: Some examples of estimators. Properties of estimators. Confidence intervals. Hypothesis testing. References. Problems. — *Parameter estimation methods*: Introduction. Relations between observed random variables and parameters. Expected values, variances, covariances. Linear problems. Least squares. Gauss-Markov estimation. Some other estimators. Cost. Monte Carlo methods. References. — *Introduction to linear estimation*: Motivation, models, and assumptions. Ordinary least squares estimation (OLS). Maximum likelihood (ML) estimation. Maximum a posteriori (MAP) estimation. Multiple data points. Coefficient of multiple determination (R^2). Analysis of variance about the sample mean. Analysis of variance about the regression line for multiple measurements at each X_i . Confidence interval about the points on the regression line. Violation of the standard assumption of zero mean errors. Violation of the standard assumption of normality. Violation of the standard assumption of constant variance. Violation of standard assumption of uncorrelated errors. Errors in independent and dependent variables. — *Matrix analysis for linear parameter estimation*: Introduction to matrix notation and operations. Least squares estimation. Orthogonal polynomials in OLS estimation. Factorial experiments. Maximum likelihood estimator. Linear maximum a posteriori estimator (MAP). Sequential estimation. Matrix formulation for confidence intervals and regions. Matrix analysis with correlated observation errors. — *Minimization of sum of squares functions for models nonlinear in parameters*: Matrix form of Taylor series expansion. Sum of squares function. Gauss method of minimization. Examples to illustrate Gauss minimization method involving ordinary differential equations. Modifications of Gauss method. Model building and confidence regions. Sequential estimation for multiresponse data. Examples utilizing sequential estimations. Sensitivity coefficients. — *Design of optimal experiments*: Introduction. One parameter examples. Criteria for optimal experiments for multiple parameters. Algebraic examples for two parameters and large n . Optimal parameter estimation involving the partial differential equation of heat conduction. Nonstandard assumptions. Sequential optimization. Not all parameters of interest. Design criteria for model discrimination. — *Appendices*: Identifiability condition. Estimators and covariances for various estimation methods for the linear model $\eta = \chi\beta$. List of symbols. Some estimation programs.

Sidney A. MORRIS. — **Pontryagin duality and the structure of locally compact abelian groups.** — London mathematical society lecture note series, vol. 29. — Un vol. broché, 16 × 23, de VIII, 128 p. — Prix: £4.95. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Preface. — Introduction to topological groups. — Subgroups and quotient groups of R^n . — Uniform spaces and dual groups. — Introduction to the Pontryagin-van Kampen duality theorem. — Duality for compact and discrete groups. — The duality theorem and the principal structure theorem. — Consequences of the duality theorem. — Locally Euclidean and NSS-groups. — Non-abelian groups. — References. — Index of terms. — Index of exercises, propositions and theorems.

I. J. MADDOX. — **Elements of functional analysis.** — Un vol. broché, 15 × 23, de x, 208 p. — Prix: £2.95. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1970.

Basic set theory and analysis : Sets and functions. Real and complex numbers. Sequences of functions, continuity, differentiability. Inequalities. — *Metric and topological spaces* :

Metric and semimetric spaces. Complete metric spaces. Some metric and topological concepts. Continuous functions on metric and topological spaces. Compact sets. Category and uniform boundedness. — *Linear and linear metric spaces*: Linear spaces. Subspaces, dimensionality, factorspaces, convex sets. Linear metric spaces, paranorms, seminorms and norms. Basis. Distributions. — *Normed linear spaces*: Convergence and completeness. Linear operators and functionals. The Banach-Steinhaus theorem. The open mapping and closed graph theorems. The Hahn-Banach extension theorem. Weak convergence. — *Banach algebras*: Algebras and Banach algebras. Homomorphisms and isomorphisms. The spectrum and the Gelfand-Mazur theorem. The Gelfand representation theorem. — *Hilbert space*: Inner product and Hilbert spaces. Orthonormal sets. The dual space of a Hilbert space. — *Matrix transformations in sequence spaces*: Matrix and linear transformations. Algebras of matrices. Summability. Tauberian theorems. Some problems for further study.

Joachim ROSENmueller. — **Extreme games and their solutions.** Lecture notes in economics and mathematical systems, vol. 145. — Un vol. broché, 17 × 25, de III, 126 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Preliminaries: Introductory remarks. Notations and definitions. — *Convex games*: Representation. Extreme points of c^1 . — *Superadditive games*: Representation. Extreme points of s^1 . Solutions of extreme zero-sum games. — *Examples*: Production games. Selling goods in minimal quantities.

Convex analysis and its applications. — Proceedings of a conference held at Murat-le-Quaire, March 1976. — Ed. by Alfred Auslender. — Lecture notes in economics and mathematical systems, vol. 144. — Un vol. broché, 17 × 25, de v, 219 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

M. Atteia et J. Audouinet: Noyaux des sous-espaces de Banach réflexif d'un espace localement convexe. — *B. Cornet*: An abstract theorem for planning procedures. — *P. Charrier, B. Hanouzet et J. L. Joly*: Estimation and regularity for the maximum lower solution of a unilateral problem. — *J. P. Crouzeix*: Conjugacy in quasiconvex analysis. — *O. Debordes*: Duality: some results in asymptotical elastoplasticity. — *R. Janin*: Sensitivity for non convex optimization problems. — *P. J. Laurent et C. Carasso*: A dual algorithm in quasi-convex optimization. — *J. Mossino*: Etude d'une inéquation quasi-variationnelle apparaissant en physique. — *M. F. Nougues-Sainte-Beuve*: Vector measures with bounded variation: a topological property and some applications. — *G. Owen*: Computation of equilibrium price and quantity vectors. — *J. Saint-Pierre*: Borel convex-valued multifunctions. — *R. J. B. Wets*: On the convergence of random convex sets. — *J. P. Zolesio*: An optimal design procedure for optimal control support.

Werner GAEHLER. — **Grundstrukturen der Analysis I.** — Mathematische Reihe, Band 58. — Un vol. relié, 18 × 25, de VIII, 412 p. — Prix: FS 64.00. — Birkhäuser Verlag, Basel/Stuttgart, 1977.

Mengenlehre: Zum Klassenbegriff. Über Klassenbildung. Mengentheoretische Operationen. Die leere Klasse und die Allklasse. Vereinigung und Durchschnitt der Elemente einer Klasse, Potenzklassen. Einer-, Zweier-, Dreierklassen usw. Geordnete Paare, cartesische Produkte. Relationen. Spezielle Relationen. Abbildungen. Familien.

Weitere Definitionen bezüglich Familien. Ordnungen. Ordinalzahlen. Natürliche Zahlen. Das Auswahlaxiom. Kardinalzahlen. — *Filtertheorie*: Verbände. Λ -Ideale. Gitter. Filter. Induzierte Filterabbildungen. Produktfilter. Filter im Mengenprodukten. Gefilterte Familien, Netze, Folgen. Dualfilter. Λ -Ideale von Filtern. Λ -Ideale von Dualfiltern. Über Systeme von Λ -Idealen von Dualfiltern. — *Limesräume*: Kategorien. Projektive und induktive Limites. Limesräume und pseudotopologische Räume. Mehrstufig topologische und topologische Räume. Vergleich von Limitierungen. Stetige Abbildungen, die Kategorie der Limesräume. Trennungsaxiome. Initiallimitierungen. Teilräume. Produkträume. Projektive Limites in der Kategorie der Limesräume und in Unterkategorien. Finallimitierungen. Quotientenräume. Summenräume. Induktive Limites in der Kategorie der Limesräume und in Unterkategorien. Kompaktheitsbegriffe. Choquetsche Limesräume. Zusammenhang und lokaler Zusammenhang. Durch konvergente Folgen bestimmte Konvergenzstrukturen. — *Limesuniforme Räume*: Limesuniforme, pseudouniforme und uniforme Räume. Vergleich limesuniformer Strukturen. Limesuniformisierbarkeit. Gleichmässig stetige Abbildungen, die Kategorie der limesuniformen Räume. Limesuniforme Initialstrukturen. Teil- und Produkträume. Projektive Limites in der Kategorie der limesuniformen Räume und in Unterkategorien. Limesuniforme Finalstrukturen. Quotienten- und Summenräume. Induktive Limites in der Kategorie der limesuniformen Räume und in Unterkategorien. Gleichmässig Choquetsche limesuniforme Räume. Vollständigkeit. Vervollständigung limesuniformer Räume.

Albert ROMANO. — **Applied statistics for science and industry.** — Un vol. relié, 17 × 25 de xiv, 513 p. — Prix: £14.45. — Allyn and Bacon, Boston/London/Sydney/Toronto, 1977.

Introduction: Statistical inference. Some applications. Some remarks. — *Classical inference: estimation and confidence intervals*: Sampling, sampling distributions, and the central limit theorem. Confidence intervals for a population mean. Confidence intervals for differences between two population means. Confidence intervals for proportions. Confidence intervals for differences between two population proportions. Confidence intervals for a population variance. Confidence intervals for the ratio between two population variances. Relationship of α , η , μ , and σ to length of confidence interval. A nonclassical approach: Bayesian inference. Exercises. — *Classical inference: hypothesis testing*: Introduction. Describing the problem. Confidence intervals, hypothesis testing, and risk. A formal structure for the testing procedure. Hypotheses involving one population mean. Type II error. Hypotheses involving two population means. Hypotheses involving proportions. Hypotheses involving one variance. Hypothesis involving two variances. General remarks. A non-classical approach: Bayesian decision analysis. Exercises. — *Curve fitting and regression analysis*: Introduction. Linear relationship, one independent variable. Linear relationship, more than one independent variable. Quadratic relationship, one independent variable. Some models that can be linearized. Some general remarks. Exercises. — *Correlation*: Introduction. Simple correlation. Multiple correlation. Coefficient of determination. Other measures of correlation. Some general remarks. Exercises. — *Goodness-of-fit*: The z^2 statistic. An extension. Applications to continuous distributions. The Kolmogorov-Smirnov one-sample test. Some final remarks. Exercises. — *Other nonparametric tests*: Introduction. The one-sample sign test. Two-sample sign tests. The Kolmogorov-Smirnov two-sample test. Ranksum tests. The Wald-Wolfowitz total number of runs test. Tests for correlation and independence. Some remarks. Exercises. — *Analysis of variance: the completely randomized design*: Introduction. Completely randomized design (one-way, fixed effects). Contrasts and comparisons. Tests for homoscedasticity. Transformations. Type II errors. Random

effects model. Summary of the assumptions underlying the analysis of variance. Exercises. — *Analysis of variance : randomized blocks and Latin-square designs* : The randomized blocks design. Latin square design. Some remarks. Exercises. — *Analysis of variance : factorial experiments* : Introduction. Two-factor, completely randomized design. Two-factor, randomized blocks design. Further remarks. Exercises. — *Analysis of covariance* : Introduction. The one-factor, completely randomized design. The one-factor, randomized blocks design. The two-factor, completely randomized design. Some concluding remarks. Exercises. — *Appendix A* : List of examples. — *Appendix B* : Statistical tables.

V. S. VARADARAJAN. — **Harmonic analysis on real reductive groups.** — Lecture notes in mathematics, vol. 576. — Un vol. broché, 17 × 25, de vi, 521 p. — Prix: DM 39.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Part I: Summary. Orbit structure of the adjoint representation. Transfer of distributions and differential operators from \mathfrak{g} to \mathfrak{z} . — The invariant integral on \mathfrak{g} . Local structure of invariant eigendistributions on \mathfrak{g} : behaviour around regular and semiregular points. Local structure of invariant eigendistributions on \mathfrak{g} : the fundamental theorem. Local structure of invariant eigendistributions on \mathfrak{g} : the behaviour of the function F around singular points. Tempered invariant eigendistributions on a reductive Lie algebra. A limit formula .Invariant differential operators that annihilate all invariant distributions. — *Part II*: Summary. Groups of class H . Orbit structure in G . Descent from G to Z and \mathfrak{z} . Local structure of invariant \mathfrak{Z} -finite distributions. The distributions Θ_b^* . Parabolic subgroups. Some representation theory. The functions Ξ and σ . Schwartz space and tempered distributions. The invariant integral on $C_c^\infty(G)$. A fundamental estimate. The invariant integral on $C(G)$. Tempered invariant eigendistributions. Asymptotic behaviour of eigenfunctions. The discrete series for G . The space of cusp forms. Determination of $c(G)$.

Séminaire Pierre Lelong (Analyse), année 1975/76, et Journées sur les fonctions analytiques, Toulouse, 1976. — Édité par Pierre Lelong. — Lecture note in mathematics, vol. 578. — Un vol. broché, 17 × 25, de vi, 327 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Séminaire d'analyse (P. Lelong) : W. Thimm : Sur les décompositions primaires des faisceaux analytiques cohérents. — *N. Sibony* : Principe du maximum sur une variété C . *R. et équations de Monge-Ampère complexes*. — *Th. Bloom* : Sur le contact entre sous-variétés réelles et sous-variétés complexes de \mathbb{C}^n . — *P. Krée* : Théorie de la mesure et holomorphie en dimension infinie. — *Tan-Vo-Van* : La classification des espaces 1-convexes. — *C. O. Kiselman* : Fonctions delta-convexes, delta-sousharmoniques et delta-plurisousharmoniques. — *M. Waldschmidt* : Propriétés arithmétiques de fonctions de plusieurs variables (II). — *P. Lelong* : Sur la structure des courants positifs fermés. — *Journées de fonctions analytiques, Toulouse, 5-8 mai 1976* : *Aimée Baillelette* : Approximation de fonctions par des exponentielles imaginaires. — *C. C. Chou* : Distributions, hyperfonctions et le microspectre analytique. — *G. Coeuré* : Sur le rayon de bornologie des fonctions holomorphes. — *R. Cuppens* : Fonctions à crête. — *M. Derridj et D. Tartakoff* : Sur la régularité locale des solutions du problème de Neumann pour $\bar{\partial}$. — *G. Dloussky* : Enveloppes d'holomorphie et prolongements d'hypersurfaces. — *L. Gruman* : La géométrie globale des ensembles analytiques. — *C. O. Kiselman* : Construction de fonctions entières à rayon de convergence donné. — *P. Mazet* : Sous-ensembles analytiques de dimension finie d'un espace vectoriel topologique de dimension quelconque. — *Ph. Nover-*

raz : Sur la mesure gaussienne des ensembles polaires en dimension finie. — *P. Raboin* : Résolution de l'équation $f = F$ sur un espace de Hilbert. — *M.-H. Schwartz* : Sections holomorphes d'espaces à fibres linéaires variables. — *N. Sibony* : Valeurs au bord de fonctions holomorphes et ensembles polynomialement convexes. — *H. Skoda* : Estimations L^2 pour l'opérateur $\bar{\partial}$ et applications arithmétiques. — *J. Wagner* : Classes de Hardy pour un polydisque.

C. BREZINSKI. — **Accélération de la convergence en analyse numérique.** — Lecture notes in mathematics, vol. 584. — Un vol. broché, 17 × 25, de iv, 313 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Comparaison de suites convergentes : Rappels. Ordre d'une suite. Comparaison de deux suites. Théorèmes sur la comparaison. L'indice de comparaison. Développement asymptotique d'une série. — *Les procédés de sommation* : Formulation générale du problème. Etude de quelques procédés. Le procédé d'extrapolation de Richardson. Interprétation des procédés totaux. — *L'ε-algorithme* : Le procédé Δ^2 d'Aitken. La transformation de Shanks et de l'ε-algorithme. Propriétés de l'ε-algorithme. Interprétation de l'ε-algorithme. L'ε-algorithme et la table de Padé. Théorèmes de convergence. Application à la quadrature numérique. — *Etude de divers algorithmes d'accélération de la convergence* : Le procédé d'Overholt. Les procédés p et q . Le φ -algorithme. Généralisations de l'ε-algorithme. Le problème de l'accélération de la convergence. Le Θ -algorithme. Les transformations de Levin. Formalisation des procédés d'accélération de la convergence. Mise en œuvre des algorithmes. — *Transformation de suites non scalaires* : L'ε-algorithme matriciel. Transformation de suites dans un espace de Banach. L'ε-algorithme vectoriel. Résolution de systèmes d'équations non linéaires par l'ε-algorithme vectoriel. Calcul des valeurs propres d'une matrice par l'ε-algorithme vectoriel. L'ε-algorithme topologique. — *Algorithmes de prédiction continue* : La première forme confluente de l'ε-algorithme. Etude de la convergence. La problème de l'accélération de la convergence. Forme confluente de l'ε-algorithme topologique. Le développement en série de Taylor. Forme confluente du procédé d'Overholt. Transformation rationnelle d'une fonction. Applications. — *Les fractions continues* : Définitions et propriétés. Transformation d'une série en fraction continue. Contraction d'une fraction continue. Fractions continues associées et correspondantes. Les algorithmes de losange. Quelques résultats de convergence. Les fractions continues d'interpolation. L'interpolation d'Hermite rationnelle.

T. A. SPRINGER. — **Invariant theory.** — Lecture notes in mathematics, vol. 585. — Un vol. broché, 17 × 25, de v, 112 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Introduction : Polynomial functions, invariants of linear groups. Some algebra. The Zariski topology on V . Algebraic groups. Examples of algebras of invariants. — *The algebra of invariants* : Reductive groups. Linear reductivity. Examples. The finiteness theorem. Some results on graded algebras. — $SL_2(k)$: Representations and the coordinate algebra of $SL_2(k)$. Representation theory of $SL_2(k)$ ($\text{char } k = 0$). More about the invariant theory of $SL_2(k)$. Applications of Poincaré series. — *Finite groups* : Some general results. Invariant theory of finite reflection groups. Semi-invariants of finite reflection groups. Binary polyhedral groups. Invariant theory of binary polyhedral groups. Invariant theory of some threedimensional groups. Invariant theory of some threedimensional groups, continuation.

Séminaire d'algèbre Paul Dubreil, Paris, 1975-1976 (29^e année). — Edited by M. P. Malliavin. — Lecture notes in mathematics, vol. 586. — Un vol. broché, 17 × 25, de vi, 188 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

D. Eisenbud: Enriched free resolutions and change of rings. Solution du problème de Serre par Quillen-Suslin. — *E. G. Evans, Jr.*: A generalized principal ideal theorem with applications to intersection theory. — *G. Lallement*: Sur les produits amalgamés de monoïdes. — *G. O. Michler*: Small projective modules of finite groups. — *B. Moishezon*: Algebraic surfaces and 4-manifolds. — *A.-M. Nicolas*: Sur les conditions de chaînes ascendantes dans des groupes abéliens et des modules sans torsion. — *Frans Oort*: Singularities of coarse moduli schemes. — *J. Querré*: Sur les anneaux complètement intégralement clos. — *T. A. Springer*: Représentations de groupes de Weyl et éléments nilpotents d'algèbres de Lie. — *R. Rentschler*: Comportement de l'application de Dixmier par rapport à l'anti-automorphisme principal pour des algèbres de Lie complètement résolubles. — *J. C. Robson*: Quotient categories and Weyl algebras. — *Journées sur les demi-groupes*, org. avec le concours de J.-F. Perrot: *J. M. Howie*: Sur les demi-groupes engendrés par des idempotents. — *G. Jacob*: Semi-groupes linéaires de rang borné. Décidabilité de la finitude. — *G. Lallement*: Présentations de monoïdes et problèmes algorithmiques. — *F. Pastijn et H. Reynaerts*: Semilattices of modules. — *D. Perrin*: La représentation ergodique des codes bipréfixes. — *J. Sakarovitch*: Sur les groupes infinis, considérés comme monoïdes syntaxiques de langages formels. — *H. J. Shyr et G. Thierrin*: Codes and binary relations.

Non-commutative harmonic analysis. — Actes du colloque d'analyse harmonique non-commutative, Marseille-Luminy, 5 au 9 juillet, 1976. — Ed. by J. Carmona and M. Vergne. — Lecture notes in mathematics, vol. 587. — Un vol. broché, 17 × 25, de iv, 240 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

J. Carmona: On irreducibility of the principal series. — *J.-Y. Charbonnel*: La formule de Plancherel pour un groupe de Lie résoluble connexe. — *A. Guillementat*: On finite generation of invariants for certain sub-algebras of a semisimple Lie algebra. — *H. Jacquet*: Generic representations. — *A. Joseph*: A characteristic variety for the primitive spectrum of a semisimple Lie algebra. — *M. Kashiwara et M. Vergne*: Remarque sur la covariance de certains opérateurs différentiels. — *A. Knapp and G. Zuckerman*: Classification theorems for representations of semisimple Lie groups. — *G. Lion*: Intégrales d'entre-lacement sur des groupes de Lie nilpotents et indices de Maslov. — *F. Rodier*: Décomposition spectrale des représentations lisses. — *W. Schmid*: Two character identities for semisimple Lie groups. — *R. Takahashi*: Spherical functions in $\text{spin}_0(1, d)/\text{spin}(d-1)$ for $d = 2, 4$ and 8 .

Pierre MOLINO. — **Théorie des G-structures: le problème d'équivalence.** — Notes rédigées avec la collab. de F. Toupine. — Lecture notes in mathematics, vol. 588. — Un vol. broché, 17 × 25, de vi, 163 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Théorie des jets: Espaces de jets. Fibrés de repères. Relèvement des morphismes et des champs de vecteurs. Contact d'ordre supérieur. — *G-structures*: G-structures; modèles algébriques. Exemples classiques. Morphismes; homogénéité et transitivité. Homogénéité et transitivité infinitésimales. — *Structures d'ordre supérieur*: Définition et modèles algébriques. Exemples. Homogénéité et transitivité. Homogénéité et transitivité infinitési-

males. — *Pseudogroupes et Γ -structures*: Pseudogroupes de Lie transitifs. Algèbre formelle d'un *PLT*. Etude de l'ordre de la PAL d'un *PLT*; ordre d'un *PLT*. Γ -structures. — *Presque-structures et problème d'équivalence*: Presque- Γ -structures. Le problème d'équivalence. Rôle de l'algèbre formelle. Problème d'équivalence pour le G -structures. — *Techniques générales 1*: Etude du pseudogroupe $\Gamma_m^{k_0}$. Application aux structures de type fini. — *Techniques générales 2*: Feuilletages invariants par un *PLT*. Feuilletages invariants et idéaux fermés de l'algèbre formelle. Etude des presque-structures. Cas des prolongements généralisés. — *Techniques générales 3*: Structure subordonnées; cas de la codimension finie. Méthode générale de réduction. — Structures plates; modèles standard: Structures plates standard. Pseudogroupes plats standard. Structures formellement plates. — *Théorème d'équivalence 1*: Enoncé; principe de la démonstration. Le cas irréductible. Cas non irréductible; première réduction du problème. Le cas abélien. — *Théorème d'équivalence 2*: Un nouveau passage au quotient. Quotients de type abélien. Quotients de type simple. Fin de la démonstration. — *Généralisations et applications*: Structures rigides. Théorème d'équivalence. Application: lemme de platitude relative. Systèmes à coefficients constants.

Keith KENDING. — **Elementary algebraic geometry**. — Graduate texts in mathematics, vol. 44. — Un vol. relié, 17 × 25, de viii, 309 p. — Prix: DM 42.70. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Examples of curves: Introduction. The topology of a few specific plane curves. Intersecting curves. Curves over \mathbf{Q} . — *Plane curves*: Projective spaces. Affine and projective varieties: examples. Implicit mapping theorems. Some local structure of plane curves. Sphere coverings. The dimension theorem for plane curves. A Jacobian criterion for nonsingularity. Curves in $\mathbf{P}^2(\mathbf{C})$ are connected. Algebraic curves are orientable. The genus formula for nonsingular curves. — *Commutative ring theory and algebraic geometry*: Introduction. Some basic lattice-theoretic properties of varieties and ideals. The Hilbert basis theorem. Some basic decomposition theorems on ideals and varieties. The Nullstellensatz: statement and consequences. Proof of the Nullstellensatz. Quotient rings and subvarieties. Isomorphic coordinate rings and varieties. Induced lattice properties of coordinate ring surjections: examples. Induced lattice properties of coordinate ring injections. Geometry of coordinate ring extensions. — *Varieties of arbitrary dimension*: Introduction. Dimension of arbitrary varieties. The dimension theorem. A Jacobian criterion for non-singularity. Connectedness and orientability. Multiplicity. Bézout's theorem. — *Some elementary mathematics on curves*: Introduction. Valuation rings. Local rings. A ring-theoretic characterization of nonsingularity. Ideal theory on a non-singular curve. Some elementary function theory on a nonsingular curve. The Riemann-Roch theorem.

R. K. SACHS and H. WU. — **General relativity for mathematicians**. — Graduate texts in mathematics, vol. 48. — Un vol. relié, 17 × 25, de vi, 327 p. — Prix: DM 31.00. — Springer Verlag, Berlin/New York/Heidelberg, 1977.

Preliminaries: Review and notation. Physics background. Preview of relativity. — *Spacetimes*: Review and notation. Causal character. Time orientability. Spacetimes. Examples of spacetimes. — *Observers*: Mathematical preliminaries. Observers and instantaneous observers. Gyroscope axes. Reference frames. — *Electromagnetism and matter*: Basic concepts. Interactions. Other matter models. — *The Einstein field equation*: Review and notation. The Einstein field equation. Ricci flat spacetimes. Gravitational

attraction and the phenomenon of collapse. — *Photons*: Mathematical preliminaries. Photons. Light signals. Synchronizable reference frames. Frequency ratio. Photon distribution functions. Integration on lightcones. A photon gas. — *Cosmology*: Review, notation and mathematical preliminaries. Data. Cosmological models. The Einstein-de Sitter model. Simple cosmological models. The early universe. Other models. Appendix: Luminosity distance in the Einstein-de Sitter model. — *Further applications*: Review and notation. Preview. Stationary spacetimes. The geometry of Schwarzschild spacetimes. The solar system. Black holes. Gravitational plane waves. — *Optional exercises: relativity*: Lorentzian algebra. Differential topology and geometry. Chronology and causality. Isometries and characterization of gravitational fields. The Einstein field equation. Gases. — *Optional exercises: Newtonian analogues*: Review and notation. Maxwell's equations. Particles. Gravity.

K. W. GRUENBERG and A. J. WEIR. — **Linear geometry**. — 2d edition. — Graduate texts in mathematics, vol. 49. — Un vol. relié, 17 × 25, de x, 198 p. — Prix: DM 29.10. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Vector spaces: Sets. Groups, fields and vector spaces. Subspaces. Dimension. The ground field. — *Affine and projective geometry*: Affine geometries. Affine proposition of incidence. Affine isomorphisms. Homogeneous vectors. Projective geometries. The embedding of affine geometry in projective geometry. The fundamental incidence theorems of projective geometry. — *Isomorphisms*: Affinities. Projectivities. Linear equations. Affine and projective isomorphisms. Semi-linear isomorphisms. Groups of automorphisms. Central collineations. — *Linear mappings*: Elementary properties of linear mappings. Degenerate affinities and projectivities. Matrices. The rank of a linear mapping. Linear equations. Dual spaces. Dualities. Dual geometries. — *Bilinear forms*: Elementary properties of bilinear forms. Orthogonality. Symmetric and alternating bilinear forms. Structure theorems. Correlations. Projective quadrics. Affine quadrics. Sesquilinear forms. — *Euclidean geometry*: Distances and Euclidean geometries. Similarity Euclidean geometries. Euclidean quadrics. Euclidean automorphisms. Hilbert spaces. — *Modules*: Rings and modules. Submodules and homomorphisms. Direct decompositions. Equivalence of matrices over $F[X]$. Similarity of matrices over F . Classification of collineation.

N. ROUCHE, P. HABETS, M. LALOY. — **Stability theory by Liapunov's direct method**. — Applied mathematical sciences, vol. 22. — Un vol. broché, 17 × 25, de xii, 396 p. — Prix: DM 33.60. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Elements of stability theory. — Simple topics in stability theory. — Stability of a mechanical equilibrium. — Stability in the presence of first integrals. — Instability. — A survey of qualitative concepts. — Attractivity for autonomous equations. — Attractivity for non autonomous equations. — The comparaison method. — Appendix 1: Dini derivatives and monotonic functions. — Appendix 2: The equations of mechanical systems. — Appendix 3: Limit sets.

M. H. PROTTER and C. B. MORREY. — **A first course in real analysis**. — Undergraduate texts in mathematics. — Un vol. relié, 17 × 25, de xii, 507 p. — Prix: DM 42.70. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

The real number theorem: Axioms for a field. Natural numbers, sequences, and extensions. Inequalities. Mathematical induction — definition of natural number. —

Continuity and limits : Continuity. Theorems on limits. One-sided limits — continuity on sets. Limits at infinity — infinite limits. Limits of sequences. — *Basic properties of functions on \mathbf{R}_1* : The intermediate-value theorem. Least upper bound; greatest lower bound. The Bolzano-Weierstrass theorem. The boundedness and extreme-value theorems. Uniform continuity. Cauchy sequences and the Cauchy criterion. The Heine-Borel and Lebesgue theorems. — *Elementary theory of differentiation* : Differentiation of functions on \mathbf{R}_1 . Inverse functions. — *Elementary theory of integration* : The Darboux integral for functions on \mathbf{R}_1 . The Riemann integral. The logarithm and exponential functions. Jordan content. — *Metric spaces and mappings* : The Schwarz and triangle inequalities — metric spaces. Fundamentals of point set topology. Denumerable sets — countable and uncountable sets. Compact sets and the Heine-Borel theorem. Functions defined on compact sets. Connected sets. Mappings from one metric space to another. — *Differentiation in \mathbf{R}_N* : Partial derivatives. Higher partial derivatives and Taylor's theorem. Differentiation in \mathbf{R}_N . — *Integration in \mathbf{R}_N* : Volume in \mathbf{R}_N . The Darboux integral in \mathbf{R}_N . The Riemann integral in \mathbf{R}_N . — *Infinite sequences and infinite series* : Elementary theorems. Series of positive and negative terms. — power series. Uniform convergence. Uniform convergence of series — power series. Unordered sums. The comparison test for unordered sums — uniform convergence. Multiple sequences and series. — *Fourier series* : Formal expansions. Fourier sine and cosine series — change of interval. Convergence theorems. — *Functions defined by integrals* : The derivative of a function defined by an integral. Improper integrals. Functions defined by improper integrals — the gamma function. — *Functions of bounded variation and the Riemann-Stieltjes integral* : Functions of bounded variation. The Riemann Stieltjes integral. — *Contraction mappings and differential equations* : Fixed point theorem. Application of the fixed point theorem to differential equations. — *Implicit function theorems and differentiable maps* : The implicit function theorem for a single equation. The implicit function theorem for systems. Change of variables in a multiple integral. The Lagrange multiplier rule. — *Functions on metric spaces* : Complete metric spaces. Convex sets and convex functions. Arzela's theorem: extension of continuous functions. Approximation and the Stone-Weierstrass theorem. — *Vector field theory. The theorems of Green and Stokes* : Vector functions on \mathbf{R}_1 , arcs, and the moving trihedral. Vector functions and fields on \mathbf{R}_N . Line integrals. Green's theorem. Surfaces in \mathbf{R}_3 — parametric representation. Area of a surface and surface integrals. Orientable surfaces. The Stokes theorem. The divergence theorem.

Richard COURANT. — **Dirichlet's principle, conformal mapping, and minimal surfaces.** — Reprint of the 1st edition Interscience publishers, New York, 1950. — Un vol. relié, 17 × 25, de xi, 332 p. — Prix: DM 45.00. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Dirichlet's principle and the boundary value problem of potential theory : Dirichlet's principle. Semicontinuity of Dirichlet's integral. Dirichlet's principle for circular disk. Dirichlet's integral and quadratic functionals. Further preparation. Proof of Dirichlet's principle for general domains. Alternative proof of Dirichlet's principle. Conformal mapping of simply and doubly connected domains. Dirichlet's principle for free boundary values. Natural boundary conditions. — *Conformal mapping on parallel-slit domains* : Introduction. Solution of variational problem II. Conformal mapping of plane domains on slit domains. Riemann domains. General Riemann domains. Uniformization. Riemann domains defined by non-overlapping cells. Conformal mapping of domains not of genus zero. — *Plateau's problem* : Introduction. Formulation and solution of basic variational problems. Proof by conformal mapping that solution is a minimal surface. First variation of Dirichlet's integral. Additional remarks. Unsolved problems. First variation and

method of descent. Dependence of area on boundary. — *The general problem of Douglas* : Introduction. Solution of variational problem for k -fold connected domains. Further discussion of solution. Generalization to higher topological structure. — *Conformal mapping of multiply connected domains* : Introduction. Conformal mapping on circular domains. Mapping theorems for a general class of normal domains. Conformal mapping on Riemann surfaces bounded by unit circles. Formulation of theorem. Uniqueness theorems. Supplementary remarks. Existence of solution for variational problem in two dimensions. — *Minimal surfaces with free boundaries and unstable minimal surfaces* : Introduction. Free boundaries. Preparations. Minimal surfaces with partly free boundaries. Minimal surfaces spanning closed manifolds. Properties of the free boundary. Transversality. Unstable minimal surfaces with prescribed polygonal boundaries. Unstable minimal surfaces in rectifiable contours. Continuity of Dirichlet's integral under transformation of \mathbf{r} -space. — Bibliography. — Appendices. — Supplementary notes (1977).

Roger C. LYNDON and Paul E. SCHUPP. — **Combinatorial group theory.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, vol. 89. — Un vol. relié, 17 × 25, de xiv, 339 p. — Prix: DM 72.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Free groups and their subgroups : Nielsen's method. Subgroups of free groups. Automorphisms of free groups. Stabilizers in $\text{Aut}(F)$. Equations over groups. Quadratic sets of word. Equations in free groups. Abstract length functions. Representations of free groups; the Fox calculus. Free products with amalgamation. — *Generators and relations* : Finite presentations. Fox calculus, relation matrices, connections with cohomology. The Reidemeister-Schreier method. Groups with a single defining relator. Magnus' treatment of one-relator groups. — *Geometric methods* : Complexes. Covering maps. Cayley complexes. Planar Cayley complexes. F -groups continued. Fuchsian complexes. Planar groups with reflections. Singular subcomplexes. Spherical diagrams. Aspherical groups. Coset diagrams and permutation representations. Behr graphs. — *Free products and HNN extensions* : Free products. Higman-Neumann-Neumann extensions and free products with amalgamation. Some embedding theorems. Some decision problems. One-relator groups. Bipolar structures. The Higman embedding theorem. Algebraically closed groups. — *Small cancellation theory* : Diagrams. The small cancellation hypothesis. The basic formulas. Dehn's algorithm and Greendlinger's lemma. The conjugacy problem. The word problem. Applications to knot groups. The theory over free products. Small cancellation products. Small cancellation theory over free products with amalgamation and *HNN* extensions.

Séminaire de géométrie algébrique du Bois-Marie 1965-66: SGA 5. — Dirigé par A. Grothendieck, avec la collab. de I. Bucur, C. Houzel, L. Illusie, J.-P. Jouanolou et J.-P. Serre. — Cohomologie I -adique et fonctions L . — Lecture notes in mathematics, vol. 589. — Un vol. broché, 17 × 25, de xii, 484 p. — Prix: DM 37.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

A. Grothendieck : Complexes dualisants. — *A. Grothendieck* : Formule de Lefschetz. — *L. Illusie* : Calculs de termes locaux. — *J.-P. Jouanolou* : Systèmes projectifs J -adiques. — *J.-P. Jouanolou* : Cohomologie adique. — *J.-P. Jouanolou* : Cohomologie de quelques schémas classiques et théorie cohomologique des classes de Chern. — *A. Grothendieck* : Groupes de classes de catégories abéliennes et triangulées, complexes parfaits. — *A. Grothendieck* : Formule d'Euler-Poincaré en cohomologie étale. — *A. Grothendieck* : Formules de Nielsen-Wecken et de Lefschetz en géométrie algébrique. — *C. Houzel* : Morphisme de Frobenius et rationalité des fonctions L .

Hideya MATSUMOTO. — **Analyse harmonique dans les systèmes de Tits bornologiques de type affine.** — Lecture notes in mathematics, vol. 590. — Un vol. broché, 17 × 25, de III, 219 p. — Prix: DM 24.80. — Springer Verlag: Berlin/Heidelberg/New York, 1977.

Généralités sur les fonctions sphériques: Fonctions sphériques sur G/K . Transformation de Fourier commutative. Une remarque sur d'autres fonctions sphériques. — *Une analyse harmonique dans les systèmes de Coxeter*: Algèbres de convolution sur un système de Coxeter. Algèbres de convolution involutives. Espaces L^P . Représentations unitaires et fonctions de type positif. Fonctions sphériques. Le cas exemplaire des groupes diédraux. Application à un problème combinatoire. — *Systèmes de racines et groupes de Weyl affines*: Définitions et rappels. Fonctions quasi-multiplicatives sur W . Algèbre involutive des invariants exponentiels. Polynômes et caractères sur un monoïde commutatif. — *Analyse harmonique dans les groupes de Weyl affines*: Représentations de la série principale. Quelques théorèmes fondamentaux. Opérateurs d'entrelacement. Fonctions sphériques sur W/W^0 . Mesures de Plancherel partielles. — *Systèmes de Tits bornologiques de type affine*: Rappels sur les systèmes de Tits. Systèmes de Tits bornologiques. Une décomposition d'Iwasawa et ses conséquences. Sous-groupes radiciels et sous-groupes paraboliques. Suites de Jordan-Hölder et opérateurs d'entrelacement. Représentations unitaires des groupes de rang 1.

G. A. ANDERSON. — **Surgery with coefficients.** — Lecture notes in mathematics, vol. 591. — Un vol. broché, 17 × 25, de VIII, 157 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Preliminaries: Modules. Homology and cohomology with twisted coefficients. Δ -sets. Microbundles, block bundles and spherical fibrations. The immersion classification theorem. Intersection numbers. Algebraic *K-theory*. Localization. — *Whitehead torsion*. — *Poincaré complexes*: Poincaré duality. Spherical fibrations and normal maps. — *Surgery with coefficients*: Surgery. The problem of surgery with coefficients. Surgery obstruction groups. The simply connected case. The exact sequence of surgery. — *Relative surgery*: Handle subtraction and applications. Geometric definition of surgery groups. Classifying spaces for surgery. The periodicity theorem, part 1. — *Relations between surgery theories*: The long exact sequence of surgery with coefficients. The Rothenberg sequence. The periodicity theorem, part 2. Simple linking numbers. — *Appendix A*: Torsion for n -ads. — *Appendix B*: Higher *L*-theories. — *Appendix C*: *L* groups of free abelian groups. — *Appendix D*: Ambient surgery and surgery leaving a submanifold fixed. — *Appendix E*: Homotopy and homology spheres.

Detlef VOIGT. — **Induzierte Darstellungen in der Theorie der endlichen, algebraischen Gruppen.** — Lecture notes in mathematics, vol. 592. — Un vol. broché, 17 × 25, de V, 413 p. — Prix: DM 37.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

I. Kapitel: Das Kriterium von Blattner. Einfache Darstellungen von auflösbaren, algebraischen Gruppen. Folgerungen aus dem Kriterium von Blattner. Monomiale Gruppen. Die Sätze von Shoda in der Situation endlicher, algebraischer Gruppen. Der Satz von Taketa in der Situation endlicher, algebraischer Gruppen. Satz und Lemma von Dade in der Situation endlicher, algebraischer Gruppen. Exkurs über die Frattinialgebra einer p -Liealgebra. — *II. Kapitel*: Das Schema der Darstellungen einer Algebra. Das Schema der Zerlegungen eines Moduls. Das verallgemeinerte Taylorlemma. Induzierte und Koinduzierte Darstellungen. Induzierte Moduln, die von stabilen Moduln herrühren. Der

Zerlegungssatz von Mackey. Filtrierungen auf induzierten Moduln. — *III. Kapitel*: Verschränkte Produkte. Das Rechnen mit verschränkten Produkten. Endomorphismenringe induzierter Darstellungen als verschränkte Produkte.

Klaus BARBEY and Heinz KOENIG. — **Abstract analytic function theory and Hardy algebras.** — Lecture notes in economics, vol. 593. — Un vol. broché, 17 × 25, de VII, 260 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Boundary value theory for harmonic and holomorphic functions in the unit disk : Harmonic functions. Pointwise convergence: the Fatou theorem and its converse. Holomorphic functions. The function classes $Hol^\#(D)$ and $H^\#(D)$. — *Function algebras: the bounded-measurable situation*: Szegö functional and fundamental lemma. Measure theory: prebands and bands. The abstract F . and M . Riesz theorem. Gleason parts. The abstract Szegö-Kolmogorov-Krein theorem. — *Function algebras: the compact-continuous situation*: Representative measures and Jensen measures. Return to the abstract F . and M . Riesz theorem. The Gleason and Harnack metrics. Comparison of the two Gleason part decompositions. — *The abstract Hardy algebra situation*: Basic notions and connections with the function algebra situation. The functional α . The function classes $H^\#$ and $L^\#$. The Szegö situation. — *Elements of abstract Hardy algebra theory*: The moduli of the invertible elements of $H^\#$. Substitution into entire functions. Substitution into functions of class $Hol^\#(D)$. The function class H^+ . Weak- L^1 properties of the functions in H^+ . Value carrier and Lumer spectrum. — *The abstract conjugation*: A representation theorem. Definition of the abstract conjugation. Characterization of E with the means of M . The basic approximation theorem. The Marcel Riesz and Kolmogorov estimations. Special situations. Return to the Marcel Riesz and Kolmogorov estimations. — *Analytic disk and isomorphisms with the unit disk situation*: The invariant subspace theorem. The maximality theorem. The analytic disk theorem. The isomorphism theorem. Complements on the simple invariance of $H\varphi$. A class of examples. — *Weak compactness of M* : The decomposition theorem of Hewitt-Yosida. Strict convergence. Characterization theorem and main result. — *Logmodular densities and small extensions*: Logmodular densities. The closed subgroup lemma. Small extensions. — *Function algebras on compact planar sets*: Consequences of the abstract Hardy algebra theory. The Cauchy transformation of measures. Basic facts on $P(K) \subset R(K) \subset A(K)$. On the annihilating and the representing measures for $R(K)$ and $A(K)$. On the Gleason parts for $R(K)$ and $A(K)$. The logarithmic transformation of measures and the logarithmic capacity of planar sets. The Walsh theorem. Application to the problem of rational approximation. — *Appendix*: Linear functionals and the Hahn-Banach theorem. Measure theory. The Cauchy formula via the divergence theorem.

Singular perturbations and boundary layer theory. — Proceedings of the Conference held at the Ecole centrale de Lyon, December 8-10, 1976. — Ed. by C. M. Brauner, B. Gay, and J. Mathieu. — Lecture notes in mathematics, vol. 594. — Un vol. broché, 17 × 25, de VII, 539 p. — Prix: DM 41.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

31 exposés par: J. Baranger. — A. Bensoussan, J. L. Lions, G. Papanicolau. — Yu. A. Berezin, G. I. Dudnikova, V. A. Novikov, N. N. Yanenko. — A. Bourgeat, R. Tapiero. — C. M. Brauner, B. Nicolaenko. — J. S. Darrozes. — A. S. Demidov. — G. Duvaut. — W. Eckhaus. — Ph. Gatignol. — J. Genet, M. Madaune. — N. Gordon, F. C. Hoppensteadt. — J. P. Guiraud. — M. Holt, M. Y. Hussaini, — F. C. Hoppens-

teadt, W. L. Miranker. — D. Huet. — Th. Levy. — P. Louvet, J. Durivault. — J. L. Lumley. — J. Mathieu, B. Gay. — F. Mignot, J. P. Puel. — F. Obermeier. — R. E. O'Malley, Jr., J. E. Flaherty. — E. Sanchez-Palencia. — D. B. Spalding. — L. Tartar. — V. A. Trenogin. — V. A. Trenogin, N. A. Sidorov. — M. van Dyke. — R. Kh. Zeytounian.

Robert A. RANKIN. — **Modular forms and functions.** — Un vol. relié, 16 × 24, de xiii, 384 p. — Prix: £16.50. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Groups of matrices and bilinear mapping: Notation. The modular group. The subgroups Γ^2 , Γ^3 , Γ^4 and $\Gamma'(1)$. The level of a subgroup; congruence subgroups. Groups of level 2. Groups of level 3. Further results. — *Mapping properties*: Conformal mappings. Fixed points. Fundamental regions. Construction of fundamental regions for $\widehat{\Gamma}(1)$ and its subgroups. Further results. — *Automorphic factors and multiplier systems*: Introduction. The functions $\sigma(S, T)$ and $\omega(S, T)$. Automorphic factors on subgroups of the modular group. Multiplier systems on $\Gamma(1)$, Γ^2 and Γ^3 . Further results. — *General properties of modular forms*: Definitions and general theorems. Dimensions of spaces of modular forms. Relations between modular forms. Modular forms of weight 2. Orders of magnitude. Further results. — *Construction of modular forms*: Poincaré series. The Hilbert space of cusp forms. The Fourier coefficients of Poincaré series. Kloosterman sums. Poincaré series belonging to $\Gamma(N)$. Poincaré series on $\Gamma(N^2)$. Modular forms on $\Gamma(N)$ of weight 2. Further results. — *Functions belonging to the full modular group*: Modular forms of even weight with constant multiplier system. Poincaré series. The cases $\delta_k = 1$. Modular forms of any real weight. Modular equations. Further remarks. — *Groups of level 2 and sums of squares*: Hermite and theta functions. Modular functions of level 2. Eisenstein series belonging to $\Gamma(2)$. Functions belonging to $\Gamma_v(2)$; sums of squares. Further remarks. — *Modular forms of level N*: Forms of fixed character or divisor. The interaction of the operators R^x and D_t . The operator J_n . The operator H_q . The operator L_q . The conjugate linear map K . Historical remarks. — *Hecke operators and congruence groups*: Double coset modules. Definition and properties of Hecke operators. The effect of Hecke operators on Poincaré series. Eigenforms. Historical and other remarks. — *Applications*: Dirichlet series. Eigenforms for the full modular group. Eigenforms for $\Gamma_v(2)$ and $\Gamma(2)$. Eigenforms of level 4. Final remarks.

Wilfried HAZOD. — **Stetige Faltungshalbgruppen von Wahrscheinlichkeitsmassen und erzeugende Distributionen.** — Lecture notes in mathematics, vol. 595. — Un vol. broché, 17 × 25, de xiii, 157 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Einleitung. — Bezeichnungen und Symbole. — Halbgruppen von Massen und Halbgruppen invariante Operatoren. Struktur der erzeugenden Distributionen. — Mischungen erzeugender Distributionen und Zufallsentwicklungen. — Über Sätze von H. Cramér, D. A. Raikoff und S. N. Bernstein. — Halbgruppen komplexer Masse und dissipative Distributionen. — Faltungshalbgruppen mit nicht trivialen idempotenten Faktoren. — Literatur. — Sachverzeichnis.

Klaus JAENICH. — **Einführung in die Funktionentheorie.** — Hochschultext. — Un vol. broché, 17 × 25, de ix, 239 p. — Prix: DM 19.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Holomorphe Funktionen. — Der Wirtinger-Kalkül. — Der Cauchysche Integralsatz. — Erste Folgerungen aus dem Cauchyschen Integralsatz. — Isolierte Singularitäten. — Analytische Fortsetzung und Monodromiesatz. — Die Umlaufszahlversion des Cauchyschen Integralsatzes. — Der Residuen-Kalkül. — Folgen holomorpher Funktionen. — Satz von Mittag-Leffler, Weierstrasscher Produktsatz und Riemannscher Abbildungssatz. — Riemannsche Flächen. — Die Riemannsche Fläche eines holomorphen Keimes. — Algebraische Funktionen (kurz gefasst).

Ernst KUEHNER und Peter LESKY. — **Grundlagen der Funktionalanalysis und Approximationstheorie.** — Moderne Mathematik in elementarer Darstellung, vol. 17. — Un vol. broché, 16 × 24, de 216 p. — Prix: DM 30.00. — Vandenhoeck und Ruprecht, Göttingen, 1977.

Metrische Räume. — Vektorräume. — Normierte Vektorräume. — Skalarproduktträume. — Approximation in endlichdimensionalen Skalarproduktträumen und normierten Vektorräumen. — Grenzwerte, Vollständigkeit, Stetigkeit. — Approximation in unendlichdimensionalen Skalarproduktträumen. — Approximation in unendlichdimensionalen normierten Vektorräumen. — Ausblicke.

Recent developments in statistics. — Proceedings of the European meeting of statisticians, Grenoble, 6-11 September, 1976. — Edited by J. R. Barra, F. Brodeau, G. Romier B. Van Cutsem. — Un vol. relié, 16 × 24, de x, 808 p. — Prix: DFL 180.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Opening lecture : H. Cramer: L'héritage de Bernoulli. — *First part : Invited papers :* Session on asymptotic expansions: Papers by H. Strasser and R. Michel. Session on the analysis of survival data in medical investigations: papers by D. P. Byar, P. N. Lee. Session on computers and statistics: papers by J. A. Nelder, Y. Schektman, J. Jockin, P. Pasquier, D. Vielle, T. Calinski, R. Tomassone. Session on data analysis and applications to human, social and nature sciences: papers by J. C. Gower, Y. Escoufier, J. de Leeuw. Session on sampling genetics: paper by G. Malecot. Session on statistical problems in control theory: paper by J. Jacod. Session on approach to statistics by children from 11 to 15: paper by P. Comiti, P. Clarou, E. Dumousseau, G. Le Nezet, J. Pincemin. Session on stochastic approximation: paper by J. B. Hiriart-Urruty. Session on statistical inference and stochastic processes in demography: papers by T. Schweder, D. Bosq, A. P. Dawid, A. F. M. Smith, J. L. Soler, S. Tolver Jensen, G. Tusnady. — *Second part : Selected contributed papers :* *Mathematical statistics and statistical inference :* 45 papers by: R. Ahmad, A. M. Abouammoh. R. Ahmad, M. A. Al-Mutair. H. T. Amundsen. A. Basilevsky, D. Hum. J. M. Bernado. R. J. Bhansali. J. Bulatovic. T. Calinski. D. M. Cifarelli, E. Regazzini. J. Dauxois, A. Pousse. S. Degerine. M. Delecroix. C. Deniau, G. Oppenheim, N. C. Viano. S. Dossou-Gbete, P. Ettinger, A. de Falguerolles. D. Dugué. J. Geffroy. R. D. Gill. P. J. Green. G. Gregoire. L. P. J. Groenewegen, K. M. van Hee. B. Gyires. M. Graf-Jacottet. P. Jacob. J. Janssen. S. Johansen. S. Kounias. V. Kurotschka. A. Le Breton. G. Lennes. H. N. Linssen. E. Lukacs. K. Matusita. A. O'Hagan. J. Y. Ouvrard. E. Pardoux. F. Pesarin. T. Pham-Dinh. M. F. Ramalhoto, D. H. Girmes. W. J. J. Rey. S. Rinco. J. Spirzglas. N. Therstappen. J. Tiago de Oliveira. A. Vevers, J. M. Taylor. H. Walk. *Applied statistics :* 12 papers by J. C. Bethlehem. J. F. Bithell, R. G. Upton. P. Dagnelie. J. Demongeot. E. Elvers. J. Gani. J. A. Greenwood. E. Jolivet. Y. Kurita. L. S. Mortensen, M. E. Larsen. H. Raynaud. A. Schroeder. *Data analysis and connected topics :* 9 papers by A. I. Albert. A. Bellacicco. J. M. Bouroche, G. Saporta, M. Tenenhaus. A. Carlier. G. Drouet d'Aubigny. M. Gondran. B. Leclerc. I. C. Lerman. F. Streit.

R. GNANADESIKAN. — **Methods for statistical data analysis of multivariate observations.** — A Wiley publication in applied statistics. — Un vol. relié, 16 × 23, de x, 311 p. — Prix: £15.00. — John Wiley and Sons, New York/London/Sydney/Toronto, 1977.

Introduction. — *Reduction of dimensionality*: General. Linear reduction techniques; Principal components analysis; Factor analysis. Nonmetric methods for nonlinear reduction of dimensionality. Nonlinear singularities and generalized principal components analysis: Nonlinear singularities; Generalized principal components analysis. — *Development and study of multivariate dependencies*: General. Internal dependencies. External dependencies. — *Multidimensional classification and clustering*: General. Classification: Distance measures; Classification strategies for large numbers of groups; Classification in the presence of possible systematic changes among replications. Clustering: Hierarchical clustering procedures; Nonhierarchical clustering procedures. — *Assessment of specific aspects of multivariate statistical models*: General. Estimation and tests of hypotheses: Location and regression parameters; Dispersion parameters; Robust estimation of location and dispersion. Data-based transformations. Assessment of distributional properties: Methods for evaluating similarity of marginal distributions; Methods for assessing normality. — *Summarization and exposure*: General. Study of an unstructured multi-response sample. Comparison of several multiresponse samples: Graphical internal comparisons among single-degree-of-freedom contrast vectors; Graphical internal comparisons among equal-degree-of-freedom groupings. Multidimensional residuals and methods for detecting multivariate outliers: Analysis of multidimensional residuals; Other methods for detecting multivariate outliers. — *Appendix*: Computer programs and software.

Klaus DEIMLING. — **Ordinary differential equations in Banach spaces.** — Lecture notes in mathematics, vol. 596. — Un vol. broché, 17 × 25, de vi, 137 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Lipschitz type conditions: Existence and uniqueness. Approximate solutions. Extension of solutions. Linear equations. Excursion to nonlinear eigenvalue problems. — *Compactness conditions*: Nonexistence. Measures of noncompactness. Existence. The set of solutions. Excursion to Ovcyannikov. — *Conditions of dissipative type*: Duality maps and semi-inner products. Uniqueness. Local existence. Global existence. Excursion to stochastic differential equations. Excursion to continuous accretive operators. — *Solutions in closed sets*: Boundary conditions. Approximate solutions. Existence. Examples. — *Flow invariance and differential inequalities*: Boundary conditions. Flow invariance. Differential inequalities. Maximal and minimal solutions. — *Countable systems of ordinary differential equations*: Lower diagonal systems. Row-finite systems. General systems. The function $\exp(At)$. — *Approximate solutions*: Galerkin approximations in Banach spaces. Galerkin approximations for countable systems. Examples. — *Related topics*: Carathéodory conditions. Weaker continuity. Evolution equations. Qualitative properties.

Geometry and topology. — Third Latin American school of mathematics: Proceedings of the school held at the Instituto de matemática pura e aplicada CNPq, Rio de Janeiro, July 1976. — Edited by Jacob Palis and Manfredo do Carmo. — Lecture notes in mathematics, vol. 597. — Un vol. broché, 17 × 25, de vi, 866 p. — Prix: DM 50.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

J. Adem and K. Y. Lam : Evaluations of some Mauder cohomology operations. — *J. S. Andrade* : Constructions géométriques de certaines séries discrètes. — *J. L. Arraut and N. M. dos Santos* : The point spectrum of the adjoint of an automorphism of a vector bundle. — *Th. Banchoff and C. McCrory* : Whitney duality and singularities of projections. — *C. Camacho and A. L. Neto* : Orbit preserving diffeomorphisms and the stability of Lie group actions and singular foliations. — *A. G. Colares and M. P. do Carmo* : On minimal immersions with parallel normal curvature tensor. — *S.-S. Chern* : Circle bundles. — *D. B. A. Epstein* : A topology for the space of foliations. — *D. B. A. Epstein and H. Rosenberg* : Stability of compact foliations. — *S. Feder and W. Iberkleid* : Secondary operations in K -theory and the generalized vector field problem. — *R. Gérard* : On holomorphic solutions of certain kind of Pfaffian systems with singularities. — *H. Gluck and D. Singer* : Scattering problems in differential geometry. — *C. Gutierrez and W. de Melo* : The connected components of Morse-Smale vector fields on two manifolds. — *G. Hector* : Feuilletages en cylindres. — *M. R. Herman* : Mesure de Lebesgue et nombre de rotation. The Godbillon-Vey invariant of foliations by planes of T^3 . — *M. Herrera* : On the construction of the trace in Serre duality. — *P. Hilton* : Localization theories for groups and homotopy types. — *H. Kollmer* : On hyperbolic attractors of codimension one. — *A. Lins, W. de Melo and C. C. Pugh* : On Liénard's equation. — *S. Łojasiewicz* : On the Weierstrass preparation theorem. — *R. Mañé* : Reduction of semilinear parabolic equations to finite dimensional C^1 flows. Axiom *A* for endomorphisms. Characterizations of *AS* diffeomorphisms. — *A. S. de Medeiros* : Structural stability of integrable differential forms. — *W. de Melo* : Accessibility of an optimum. — *J. Moser* : The scattering problem for some particle systems on the line. Proof of a generalized form of a fixed point theorem. — *J. Palis, Jr.* : Some developments on stability and bifurcations of dynamical systems. — *L. L. Rodriguez* : Convexity and tightness of manifolds with boundary. — *O. R. Ruiz M.* : Existence of brake orbits in Finsler mechanical systems. — *J. C. de Souza Kihl* : On the complex projective bundle construction. — *F. Takens* : Symmetries, conservation laws and variational principles. — *G. Tavares dos Santos* : Classification of generic quadratic vector fields with no limit cycles. — *J. Tirao* : The classifying ring of $SL(2, C)$. — *F. Tomi* : On the finite solvability of Plateau's problem. — *A. J. Tromba* : The set of curves of uniqueness for Plateau's problem has a dense interior. — *C. T. C. Wall* : Geometric properties of generic differentiable manifolds. — *E. C. Zeeman* : A catastrophe model for the stability of ships. — *E. Zehnder* : Note on smoothing symplectic and volume preserving diffeomorphisms. A simple proof of a generalization of a theorem by C. L. Siegel.

J. HOFFMANN-JØRGENSEN, T. M. LIGGETT, J. NEVEU. — **Ecole d'été de probabilité de Saint-Flour VI-1976.** — Édité par P.-L. Hennequin. — Lecture notes in mathematics, vol. 598. — Un vol. broché, 17×25 , de xii, 447 p. — Prix: DM 37.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

J. Hoffmann-Jørgensen : Probability in Banach space: Prerequisites. The tail distribution of convex functions. The two pearls of probability. — *T. M. Liggett* : The stochastic evolution of infinite systems of interacting particles: Part 1: Existence results and first ergodic theorems. The use of coupling techniques. The use of duality techniques. Other results. Part 2: Exclusion processes: Existence results and identification of simple invariant measures. The symmetric simple exclusion process. The asymmetric simple exclusion process. The exclusion process with speed change. — *J. Neveu* : Processus ponctuels: Généralités sur les processus ponctuels. Processus ponctuels stationnaires. Méthode des martingales.

Complex analysis. — Proceedings of the Conference held at the University of Kentucky, May 18-22, 1976. — Edited by J. D. Buckholtz and T. J. Suffridge. — Lecture notes in mathematics, vol. 599. Un vol. broché, 17 × 25, de x, 159 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

L. V. Ahlfors: A somewhat new approach to quasiconformal mappings in R^n . — *I. N. Baker and C.-C. Yang*: An infinite order periodic entire function which is prime. — *J. D. Buckholtz*: A uniqueness theorem with application to the Abel series. — *M. Damodaran*: On the distribution of values of meromorphic functions of slow growth. — *P. Duren*: Subordination. — *A. Edrei*: Equidistribution of the arguments of the zeros of Padé numerators. — *M. Essén and D. F. Shea*: An extremal problem in function theory. — *W. H. J. Fuchs*: A look at Wiman-Valiron theory. — *F. Gross*: Factorization of meromorphic functions and some open problems. — *W. K. Hayman*: Values and growth of functions regular in the unit disk. — *F. R. Keogh*: Some recent developments in the theory of univalent functions. — *J. Miles and D. Townsend*: On the imaginary values of meromorphic functions. — *G. Piranian*: The points of maximum modulus of a univalent function. — *L. A. Rubel and C.-C. Yang*: Values shared by an entire function and its derivative. — *W. Rudin*: Holomorphic maps of discs into F -spaces. — *I. J. Schoenberg*: On the zeros of the successive derivatives of integral functions II. — *S. M. Shah*: Entire functions of bounded index. — *T. J. Suffridge*: Starlikeness, convexity and other geometric properties of holomorphic maps in higher dimensions.

Yuriy A. ROZANOV. — **Innovation processes.** — Translation editor: A. V. Balakrishnan. — Scripta series in mathematics. — Un vol. relié, 15 × 23, de viii, 136 p. — Prix: £10.90. — V. H. Winston and Sons, Washington, D. C., 1977, (A Halsted Press book, John Wiley and Sons, New York/Toronto/London/Sydney).

Innovation processes and canonical representations: Introduction. Structural types and subordinate processes. Some examples involving innovation processes. — *Regular processes*: Isometric families. Some examples. Some models of random processes. Regularity and a problem of factorization. A theorem on factorization. — *Regular stationary processes*: A structural type of a regular stationary process. Wold decomposition and factorization of the spectral density. Multiplicity of a regular stationary process. Regularity conditions. — *Equivalent random processes*: The concept of equivalence probability interpretation in the case of Gaussian distributions. Equivalence of stationary processes. Random processes equivalent to a Wiener process.

Alexandru SOLIAN. — **Theory of modules: An introduction to the theory of module categories.** — Translated from the Romanian by Mioara Buiculescu. — Un vol. relié, 18 × 25, de x, 420 p. — Prix: £12.75. — Editura Academiei, Bucuresti, and John Wiley and Sons, London/New York/Sydney/Toronto, 1977.

Preliminary notions. — Modules and linear mappings. — Groups of homomorphisms. — Submodules and quotient modules. — Kernels, cokernels, the canonical factorization of a morphism. — Exact sequences. — Direct products. — Direct sums. — Intersections and sums of submodules. — Internal direct sum of submodules. — Linearly independent families, bases, free modules. — Modules of finite length. — Projective limits. — Inductive limits. — Commutativity properties. — Change of the ring of scalars. — Multimodules. — Duality. — Projective and injective modules. — Generators. Injective envelopes. — Representation theorems.

Benoit B. MANDELBROT. — **Fractals: Form, chance and dimension.** — Un vol. relié, 20 × 24, de xvi, 365 p. — Prix: \$17.90. — W. H. Freeman and Company, San Francisco, 1977.

Introduction. — How long is the coast of Britain? — Uses of nonconstrained chance. — Fractal events and noises. — Fractal clusters of stellar matter. — Turbulence, intermittency and curdling. — Meteorites, moon craters and soap. — Uses of self constrained chance. — Fractional Brownian facets of rivers, relief and turbulence. — Miscellany. — Biographical and historical sketches. — Mathematical lexicon and addenda.

Wilhelm STOLL. — **Value distribution on parabolic spaces.** — Lecture notes in mathematics, vol. 600. — Un vol. broché, 17 × 25, de viii, 216 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Preparations: The Chern-Levine form on projective spaces. Hermitian line bundles. Classification of semi-ample line bundles. The Chern-Levine forms for line bundles. Adaptation. Multiplicities. — *The first main theorem*: Integral theorems. The general first main theorem. Integral averages. — *The first main theorem on parabolic spaces*: Pseudoconvex and parabolic spaces. Jensen's formula on parabolic spaces. The first main theorem on logarithmic pseudoconvex spaces. The theorem of Casorati-Weierstrass. — *The second main theorem*: Jacobian sections. The Ricci function. The singular volume form of Carlson and Griffiths. The second main theorem. — *The defect relation*: The third main theorem. The defect relation. The algebraic case. Applications and variations. — *Appendix*: The singular Stokes and residue theorems. The double logarithm theorems. General position.

Modular functions of one variable V. — Proceedings international conference, University of Bonn, Sonderforschungsbereich Theoretische Mathematik July 2-14, 1976. — Edited by J.-P. Serre and D. B. Zagier. — Lecture notes in mathematics, vol. 601. — Un vol. broché, 17 × 25, de vii, 294 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

R. A. Rankin : Ramanujan's unpublished work on congruences. — K. A. Ribet : Galois representations attached to eigenforms with Nebentypus. — N. M. Katz : A result on modular forms in characteristic p. — H. P. F. Swinnerton-Dyer : On l -adic representations and congruences for coefficients of modular forms (II). — K. Doi, M. Ohta : On some congruences between cusp forms on $\Gamma_0(N)$. — R. Mazur : Rational points on modular curves. — G. Ligozat : Courbes modulaires de niveau 11. — P. G. Kluit : On the normalizer of $\Gamma_0(N)$. — D. Kubert, S. Lang : Units in the modular function field. — H. M. Stark : Class fields and modular forms of weight one. — J. Buhler : An icosahedral modular form of weight one.

Jonathan BREZIN. — **Harmonic analysis on compact solvmanifolds.** — Lecture notes in mathematics, vol. 602. — Un vol. broché, 17 × 25, de vii, 179 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Some basic examples: The most primitive examples. Some multiplicity computations. Some analytic results. The arithmetic nature of multiplicities. Dimension four. Multiplicity computations in dimension four. — *The general theory*: The theorem on discrete

spectrum. The restriction problem. The induction problem. — *Compact solvmanifolds : Nilmanifolds. Solvmanifolds.* — *Afterword* : Attribution and speculation. — Bibliography. — Index.

Boris MOISHEZON. — **Complex surfaces and connected sums of complex projective planes.** — Lecture notes in mathematics, vol. 603. — Un vol. broché, 17 × 25, de II, 234 p. — Prix: DM 24.80. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Introduction. — *Part 1 : Topology of simply-connected algebraic surfaces of given degree n* : A topological comparison theorem for fibers of holomorphic functions on complex threefolds. A topological comparison theorem for elements of linear systems on complex threefolds. Comparison of topology of simply-connected projective surfaces of degree n and non-singular hypersurfaces of degree n in \mathbf{CP}^3 . Simply-connected algebraic surfaces of general type. Topological normalization of simply-connected algebraic surfaces. — *Appendix 1 : Generic projections of algebraic surfaces into \mathbf{CP}^3* : A theorem of F. Severi. Duality theorem and corollaries of it. Proof of theorem 3. — *Part 2 : Elliptic surfaces* : Deformations of elliptic surfaces with “non-stable” singular fibers. Lefschetz fibrations of 2-toruses. Kodaira fibrations of 2-toruses. Topology of simply-connected elliptic surfaces. — *Appendix 2 : R. Livne* : A theorem about the modular group.

Banach spaces of analytic functions. — Proceedings of the Pelczynski conference held at Kent state university, July 12-16, 1976. — Ed. by J. Baker, C. Cleaver and J. Diestel. — Lecture notes in mathematics, vol. 604. — Un vol. broché, 17 × 25, de vi, 141 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

G. Bennett : An extension of the Riesz-Thorin theorem. — S. Y. Chang, D. E. Marsahll : Some algebras of bounded analytic functions containing the disk algebra. — J. A. Cima : A theorem on composition operators. — W. Davis : The distance of symmetric spaces from $l_p^{(n)}$. — W. J. Davis, W. B. Johnson : Weakly convergent sequences of Banach space valued random variables. — J. B. Garnett : Two remarks on interpolation by bounded analytic functions. — J. Johnson, J. Wolfe : Norm attaining operators on $C(S)$ spaces. — H. E. Lacey : Local unconditional structure in Banach spaces. — D. R. Lewis : Duals of tensor products. — A. L. Matheson : Closed ideals in rings of analytic functions satisfying a Lipschitz condition. — P. Ørno : A separable reflexive Banach space having no finite dimensional Cebysev subspaces. — J. W. Roberts : A nonlocally convex F -space with the Hahn-Banach approximation property. — R. Rochberg : The Banach-Mazur distance between function algebras on degenerating Riemann surfaces. — B. Russo : Operator theory in harmonic analysis. — S. Scheinberg : Cluster sets and corona theorems. — J. H. Shapiro : Remarks on F -spaces of analytic functions. — M. A. Smith, F. Sullivan : Extremely smooth Banach spaces. — C. Stegall : A proof of the martingale convergence theorem in Banach spaces.

Leo SARIO, Mitsuru NAKAI, Cecilia WANG, Lung Ock CHUNG. — **Classification theory of Riemannian manifolds: harmonic, quasiharmonic and biharmonic functions.** — Lecture notes in mathematics, vol. 605. — Un vol. broché, 17 × 25, de xx, 498 p. — Prix: 37.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Laplace-Beltrami operators : Riemann manifolds. Harmonic forms. — *Harmonic functions* : Relations $0_{\omega}^N < 0_G^N < 0_{HP}^N < 0_{HB}^N$. Relations $0_{HB}^N < 0_{HD}^N = 0_{HC}^N$. The class 0_{HL}^N .

Completeness and harmonic degeneracy. — *Quasiharmonic functions*: Quasiharmonic null classes. The class $0_{Q,L}^N P$. Quasiharmonic functions on the Poincaré N -ball. Characteristic quasiharmonic function. Negative characteristics. Integral form of the characteristic. Harmonic and quasiharmonic degeneracy of Riemannian manifolds. — *Bounded biharmonic functions*: Parabolicity and bounded biharmonic functions. Generators of bounded biharmonic functions. Independence on the metric. Bounded biharmonic functions on the Poincaré N -ball. Completeness and bounded biharmonic functions. Bounded polyharmonic functions. — *Dirichlet finite biharmonic functions*: Dirichlet finite biharmonic functions on the Poincaré N -ball. Parabolicity and Dirichlet finite biharmonic functions. Minimum Dirichlet finite biharmonic functions. — *Bounded Dirichlet finite biharmonic functions*: $H^2 D$ functions but no $H^2 C$ for $N = 2$. Higher dimensions. — *Harmonic, quasiharmonic, and biharmonic degeneracies*: Harmonic and biharmonic degeneracies. Corresponding quasiharmonic and biharmonic degeneracies. — *Riesz representation of biharmonic functions*: Metric growth of Laplacian. Riesz representation. Minimum solutions as potentials. Biharmonic and (p, q) — biharmonic projection and decomposition. — *Biharmonic Green's function γ* : Existence criterion for γ . Biharmonic measure. Biharmonic Green's function γ and harmonic degeneracy. Biharmonic Green's function γ and quasiharmonic degeneracy. — *Biharmonic Green's function β : definition and existence*: Introduction: definition and main result. Local boundedness. Fundamental kernel. Existence of β . β as a directed limit. Existence of β on hyperbolic manifolds. Existence of β on parabolic manifolds. Examples. — *Relation of 0_β^N to other null classes*: Inclusion of $0_\beta^N < 0_\gamma^N$. A noexistence test for β . Manifolds with strong harmonic boundaries but without β . Parabolic Riemannian planes carrying β . Further existence relations between harmonic and biharmonic Green's functions. — *Hadamard's conjecture on the Green's function of a clamped plate*: Green's functions of the clamped punctured disk. Hadamard's problem for higher dimensions. Duffin's function and Hadamard's conjecture.

Mathematical aspects of finite element methods: proceedings of the conference held in Rome, December 10-12, 1975. — Edited by I. Galligani and E. Magenes. — Lecture notes in mathematics, vol. 606. — Un vol. broché, 17 × 25, de v, 362 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

I. Babuska, W. C. Rheinboldt: Mathematical problems of computational decisions in the finite element method. — *C. Baiocchi*: Estimations d'erreur dans L^∞ pour les inéquations à obstacle. — *F. Brezzi*: Hybrid method for fourth order elliptic equations. — *G. Capriz*: Variational techniques for the analysis of a lubrication problem. — *J. Descloux, N. Nassif*: Interior L^∞ estimates for finite element approximations of solutions of elliptic equations. — *J. Douglas, Jr.*: H^1 -Galerkin methods for a nonlinear Dirichlet problem. — *B. Fraeijs de Veubeke*: Discretization of rotational equilibrium in the finite element method. — *I. Galligani, D. Trigiante*: Integration techniques for solving algebraic systems. — *A. George, D. R. McIntyre*: On the application of the minimum degree algorithm to finite element systems. — *G. Geymonat, M. Raous*: Méthodes d'éléments finis en viscoélasticité périodique. — *R. Glowinski, O. Pironneau*: On solving a mixed finite element approximation of the Dirichlet problem for the biharmonic operator by a "quasidirect" method and various iterative methods. — *J. L. Lions*: Sur l'approximation de problèmes à frontière libre dans les matériaux inhomogènes. — *J. L. Menaldi, E. Rofman*: Sur les problèmes variationnels non-coercifs et l'équation du transport. — *T. Miyoshi*: Application of a mixed finite element method to a nonlinear problem of elasticity. — *U. Mosco*: Error estimates for some variational inequalities. — *J. Mossino, R. Temam*: Certains problèmes non linéaires de la physique des plasmas. — *J. Nitsche*:

L_∞ -convergence of finite element approximations. — *J. T. Oden, J. K. Lee* : Dual-mixed hybrid finite element method for second-order elliptic problems. — *P. A. Raviart, J. M. Thomas* : A mixed finite element method for 2nd order elliptic problems. — *G. Sander, P. Beckers* : The influence of the choice of connectors in the finite element method. — *V. Thomée* : Some error estimates in Galerkin methods for parabolic equations. — *M. Zlamal* : Some superconvergence results in the finite element method.

Numerical analysis. — Proceedings of the colloquium on numerical analysis, Lausanne, October 11-13, 1976. — Edited by J. Descloux and J. Marti. — International series of numerical mathematics, vol. 37. — Un vol. broché, 17 × 25, de 248 p. — Prix: SF 44.00. — Birkhäuser Verlag, Basel/Stuttgart, 1977.

P. M. Lascaux : Méthodes numériques pour les calculs d'écoulements 2D instationnaires multifluides. — *A. Nitsche* : On projection methods for the plate problem. — *H. Niessner* : Multiexponential fitting methods. — *D. J. Randazzo* : Data fits with exponential functions. — *D. M. Davierwalla* : A finite element solution to the neutron diffusion equation in two dimensions. — *J. M. Blanc* : Computer calculation of the magnetic effects in the aluminium electrolytic cells. — *R. H. Morf and E. P. Stoll* : Numerical methods for the calculation of molecular dynamics. — *L. A. Glenn* : The mechanical response of brittle materials to intense impulsive loading. — *S. Merazzi and P. Stehlin* : Viscoelastic stability of shells — numerical aspects. — *P. Bremi* : Combination of analytical and numerical calculation methods. — *G. Wanner* : On the integration of stiff differential equations. — *H. Froidevaux* : Numerical solution of some nonlinear problems: applications to physics and technique.

John TODD. — **Basic numerical mathematics, vol. 2: numerical algebra.** — International series of numerical mathematics, vol. 22. Un vol. relié, 17 × 25, de 216 p. — Prix: SF 48.00. — Birkhäuser Verlag, Basel/Stuttgart, 1977.

Notations and abbreviations. — Preface. — Manipulation of vectors and matrices. — Norms of vectors and matrices. — Induced norms. — The inversion problem I: theoretical arithmetic. — The inversion problem II: practical computation. — The characteristic value problem — generalities. — The power method, deflation, inverse iteration. — Characteristic values. — Iterative methods for the solution of systems $A_x = b$. — Application: solution of a boundary value problem. — Application: least squares curve fitting. — Singular value decomposition and pseudo-inverses. — Solutions to selected problems. — Biographical remarks. — Index.

Jacques VAUTHIER. — **Problèmes d'analyse, agrégation de mathématiques.** — Années 1958-1959 et 1965 à 1975 avec rappels de cours. — Un vol. broché, 17 × 25, de 264 p. — Masson, Paris/New York/Barcelone/Milan, 1977.

Extrait du programme. — *Rappels de cours.* — *Problèmes* : Année 1958: Révision de techniques élémentaires d'analyse. Enoncé. Corrigé. — Année 1959: Equations différentielles. Enoncé. Corrigé. — Année 1965: Fonction presque périodique de Bohr. Enoncé. Corrigé. — Année 1966: Théorème de Wiener sur les séries de Fourier absolument convergentes. Enoncé. Corrigé. — Année 1967: Théorème de Weierstrass dit « de préparation » au théorème de division dans les (germes de) fonctions holomorphes à plusieurs variables. Enoncé. Corrigé. — Année 1968: Théorème d'approximation en une variable de Mer-

gelyan. Enoncé. Corrigé. — Année 1969: Fonctions entières de type exponentiel. Enoncé. Corrigé. — Année 1970: Classes de Hardy. Calcul symbolique dans des espaces de Hilbert. Enoncé. Corrigé. — Année 1971: Equations différentielles de Bessel. Enoncé. Corrigé. — Année 1972: Un théorème de Hörmander sur une équation aux dérivées partielles. Enoncé. Corrigé. — Année 1973: Problèmes des moments. Enoncé. Corrigé. — Année 1974: Polynômes orthogonaux. Représentation de fonction par des développements en séries. Enoncé. Corrigé. — Année 1975: Théorème de Hardy sur les zéros de la célèbre fonction ξ de Riemann. Enoncé. Corrigé. — Bibliographie.

Joram LINDENSTRAUSS; Lior TZAFIRI. — **Classical Banach spaces I: sequence spaces.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, vol. 95. — Un vol. relié, de 17 × 25, de XIII, 188 p. — Prix: DM 52.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Schauder bases: Existence of bases and examples. Schauder bases and duality. Unconditional bases. Examples of spaces without an unconditional basis. The approximation property. Biorthogonal systems. Schauder decompositions. — *The spaces c_0 and l_p* : Projections in c_0 and l_p and characterizations of these spaces. Absolutely summing operators and uniqueness of unconditional bases. Fredholm operators, strictly singular operators and complemented subspaces of $l_p \oplus l_r$. Subspaces of c_0 and l_p and the approximation property, complementably universal spaces. Banach spaces containing l_p or c_0 . Extension and lifting properties, automorphisms of l^∞ , c_0 and l_1 . — *Symmetric bases*: Properties of symmetric bases, examples and special block base. Subspaces of spaces with a symmetric basis. — *Orlicz sequence spaces*: Subspaces of Orlicz sequence spaces which have a symmetric basis. Duality and complemented subspaces. Examples of Orlicz sequence spaces. Modular sequence spaces and subspaces of $l_p \oplus l_r$. Lorentz sequence spaces.

Lars GÅRDING. — **Encounter with mathematics.** — Un vol. relié, 17 × 25, de IX, 270 p. — Prix: DM 22.30. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Models and reality: Models. Models and reality. Mathematical models. — *Number theory*: The primes. The theorems of Fermat and Wilson. The Gaussian integers. Some problems and results. Documents. — *Algebra*: The theory of equations. Rings, fields, modules, and ideals. Groups. Documents. — *Geometry and linear algebra*: Euclidean geometry. Analytical geometry. Systems of linear equations and matrices. Linear spaces. Linear spaces with a norm. Boundedness, continuity, and compactness. Hilbert spaces. Adjoints and the spectral theorem. Documents. — *Limits, continuity, and topology*: Irrational numbers, Dedekind's cuts, and Cantor's fundamental sequences. Limits of functions, continuity, open and closed sets. Topology. Documents. — *The heroic century*. — *Differentiation*: Derivatives and planetary motion. Strict analysis. Differential equations. Differential calculus of functions of several variables. Partial differential equations. Differential forms. Differential calculus on a manifold. Document. — *Integration*: Areas, volumes, and the Riemann integral. Some theorems on analysis. Integration in \mathbf{R}^n and measures. Integration on manifolds. Documents. — *Series*: Convergence and divergence. Power series and analytic functions. Approximation. Documents. — *Probability*: Probability spaces. Stochastic variables. Expectation and variance. Sums of stochastic variables, the law of large numbers, and the central limit theorem. Probability and statistics, sampling. Probability in physics. Document. — *Applications*: Numerical computation. Construction of models. — *The sociology, psychology, and teaching of mathematics*: Three biographies. The psychology of mathematics. The teaching of mathematics.

Harold M. EDWARDS. — **Fermat's last theorem: a genetic introduction to algebraic number theory.** — Graduate texts in mathematics, vol. 50. — Un vol. relié, 17 × 25, de xv, 410 p. — Prix: DM 45.00. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Fermat : Fermat and his “last theorem”. Pythagorean triangles. How to find Pythagorean triples. The method of infinite descent. The case $n = 4$ of the last theorem. Fermat's one proof. Sums of two squares and related topics. Perfect numbers and Fermat's theorem. Pell's equation. Other number-theoretic discoveries of Fermat. — *Euler* : Euler and the case $n = 3$. Euler's proof of the case $n = 3$. Arithmetic of surds. Euler on sums of two squares. Remainder of the proof when $n = 3$. Addendum on sums of two squares. — *From Euler to Kummer* : Introduction. Sophie Germain's theorem. The case $n = 5$. The cases $n = 14$ and $n = 7$. — *Kummer's theory of ideal factors* : The events of 1847. Cyclotomic integers. Factorization of primes $p \equiv 1 \pmod{\lambda}$. Periods. Factorization of primes $p \not\equiv 1 \pmod{\lambda}$. Computations when $p \not\equiv 1 \pmod{\lambda}$. Extension of the divisibility test. Prime divisors. Multiplicities and the exceptional prime. The fundamental theorem. Divisors. Terminology. Conjugations and the norm of a divisor. Summary. — *Fermat's last theorem for regular primes* : Kummer's remarks on quadratic integers. Equivalence of divisors in a special case. The class number. Kummer's two conditions. The proof for regular primes. Quadratic reciprocity. — *Determination of the class number* : Introduction. The Euler product formula. First steps. Reformulation of the right side. Dirichlet's evaluation of $L(1, \chi)$. The limit of the right side. The non-vanishing of L -series. Reformulation of the left side. Units: the first few cases. Units: the general case. Evaluation of the integral. Comparison of the integral and the sum. The sum over other divisor classes. The class number formula. Proof that 37 is irregular. Divisibility of the first factor by λ . Divisibility of the second factor by λ . Kummer's lemma. Summary. — *Divisor theory for quadratic integers* : The prime divisors. The divisor theory. The sign of the norm. Quadratic integers with given divisors. Validity of the cyclic method. The divisor class group: examples. The divisor class group: a general theorem. Euler's theorems. Genera. Ambiguous classes. Gauss's second proof of quadratic reciprocity. — *Gauss's theory of binary quadratic forms* : Other divisor class groups. Alternative view of the cyclic method. The correspondence between divisors and binary quadratic forms. The classification of forms. Examples. Gauss's composition of forms. Equations of degree 2 in 2 variables. — *Dirichlet's class number formula* : The Euler product formula. First case. Another case. $D \equiv 1 \pmod{4}$. Evaluation of $\sum \binom{D}{n} \frac{1}{n}$. Suborders. Primes in arithmetic progressions. — *Appendix* : *The natural numbers* : Basic properties. Primitive roots mod p . — Answers to exercises.

J. van MILL. — **Supercompactness and Wallman spaces.** — Mathematical centre tracts, vol. 85. — Un vol. broché, 16 × 24, de iv, 238 p. — Prix: DFL 29.00. — Matematisch Centrum, Amsterdam, 1977.

Basic concepts : General remarks about subbases. Some conventions. Some definitions. Set theoretic axioms. — *Supercompact spaces* : Supercompact spaces. A countable stratiifiable space no compactification of which is supercompact. Subbase characterizations of compact topological spaces. Regular supercompact spaces. Partial orderings on supercompact spaces. — *Superextensions* : Linked systems and the Stone representation theorem. Superextensions; some preliminaries. Extending continuous functions to superextensions. A partial ordering on the set of all superextensions of a fixed space. Connectedness in superextensions. The dimension of λX . Path connectedness and contractibility of λX . Subspaces of superextensions; the spaces $\sigma(X)$ and $\Sigma(X)$. Another nonsupercompact compact Hausdorff space. Subbases, convex sets and hyperspaces. — *Infinite dimensional topology* : Metrizability and superextensions. Cell-like mappings and inverse

limits. Some $\lambda(I, S)$ is a Hilbert cube. The superextension of the closed unit interval is homeomorphic to the Hilbert cube. Pseudo-interiors of superextensions. Some subspaces of λX homeomorphic to the Hilbert cube. — *Compactification theory*: Wallman compactifications; some preliminaries. Compactifications in which the collection of multiple points is Lindelöf semi-stratifiable. Compactification of locally compact spaces with zero-dimensional remainder. Tree-like spaces and Wallman compactifications. Regular supercompact superextensions. *GA* compactifications; some preliminaries. Every compactification of a separable space is a *GA* compactification. — *A survey of recent results*: Cardinal functions on superextensions. Metrizability in superextensions. The compactness number of a compact topological space. A cellular constraint in supercompact Hausdorff spaces. An external characterization of spaces which admit binary normal subbases. Some elementary proofs in fixed point theory. Reductions of the generalized De Groot conjecture. More about convexity. Convexity preserving mappings in subbase convexity theory.

Joao B. PROLLA. — **Approximation of vector valued functions.** — North-Holland mathematics studies, vol. 25. — Notas de matematica, vol. 61. — Un vol. broché, 17 × 24, de XIII, 219 p. — Prix: Dfl 55.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Introduction. — *The compact-open topology*: Basic definitions. Localizability. Preliminary lemmas. Stone-Weierstrass theorem for modules. The complex self-adjoint case. Submodules of $C(X; E)$. An example: a theorem of Rudin. Bishop's theorem. Vector fibrations. Extreme functionals. Representation of vector fibrations. The approximation property. Appendix: Non-locally convex spaces. — *The theorem of Dieudonné*. — *Extension theorems*. — *Polynomial algebras*: Basic definitions and lemmas. Stone-Weierstrass subspaces. $C(x)$ -modules. Approximation of compact operators. — *Weighted approximation*: Definition of Nachbin spaces. The Bernstein-Nachbin approximation problem. Sufficient conditions for sharp localizability. Completeness of Nachbin spaces. Dual spaces of Nachbin spaces. — Appendix: Fundamental weights. — *The space $C_o(X; E)$ with the uniform topology*. — *The space $C_b(X; E)$ with the strict topology*. — *The ε -product of L. Schwartz*: General definitions. Spaces of continuous functions. The approximation property. Mergelyan's theorem. Localization of the approximation property. — *Nonarchimedean approximation theory*: Valued fields. Kaplansky's theorem. Normed spaces. Vector-valued functions. Vector fibrations. Some applications. Bishop's theorem. Tietze extension theorem. The compact-open topology. The nonarchimedean strict topology.

Henri HOGBE-NLEND. — **Bornologies and functional analysis.** — Introductory course on the theory of duality topology-bornology and its use in functional analysis. — Translated from the French by V. B. Moscatelli. — North-Holland mathematics studies, vol. 26. — Notas de matematica, vol. 62. — Un vol. broché, 17 × 24, de XII, 144 p. — Prix: Dfl 50.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1977.

Preliminary notions of algebra and topology: Vector spaces. Preliminaries of general topology and normed spaces. Topological vector spaces. — *Bornology*: Definitions. Bounded linear maps. Fundamental examples of bornologies. Bornological convergence. — *Fundamental bornological constructions*: Initial bornologies. Product bornologies. Induced bornologies: bornological subspaces. Bornologies generated by a family of subsets. Bornological projective limits. Final bornologies. Quotient bornologies. Bornological

inductive limits. Bornological direct sums: finite-dimensional bornologies. Stability of the separation property. Bornologically closed sets: separation of bornological quotients. The associated separated bornological vector space. The structure of a convex bornological space: comparison with the structure of a locally convex space. — *Complete bornologies*: Completant bounded disks. Complete convex bornological spaces. Separated bornological vector spaces of finite dimension. The complete bornology associated with a separated vector bornology. Bornologically complete topological vector spaces. — “*Topology-bornology*”: *internal duality*: Compatible topologies and bornologies. Characterization of bornological topologies. Completely bornological spaces. The closed graph theorem. — “*Topology-bornology*”: *external duality*: The fundamental principles of duality. Weakly compact bornologies and reflexivity. — *Compact bornologies*: Hypo-Montel spaces. Schwartz spaces. Silva spaces. — *Distributions and differential operators*: Multi-dimensional notation. The bornological spaces $E'(\Omega)$ and $\mathcal{D}(\Omega)$. Distributions as bounded linear functionals. Differential operators and partial differential equations. The Silva space $E'(\Omega)$. The spaces $E'(K)$ and the bornological structure of $E'(\Omega)$. The general existence theorem for infinitely differentiable solutions. Proof of the existence theorem for infinitely differentiable solutions. Proof of the existence theorem: sufficiency. Proof of the existence theorem: necessity. Existence theorem for partial differential equations with constant coefficients. — Appendix: Existence of a fundamental solution. — Exercises.

Topics in information theory. — Second colloquium on information theory. — Edited by I. Csiszar and P. Elias. — Colloquia mathematica societatis Janos Bolyai, vol. 16. — Un vol. relié, 18 × 25, de 592 p. — Prix: Dfl 200.00. — North-Holland Publishing Company, Amsterdam/Oxford/New York, 1977.

R. Ahlswede, P. Gács: Two contributions to information theory. — *S. Arimoto*: Information measures and capacity of order α for discrete memoryless channels. — *E. Backer*: A non-statistical type of uncertainty in fuzzy events. — *P. P. Bergmans*: Information theory and sorting algorithms for almost-ordered data lists. — *E. Biglieri & M. Elia*: Some results on symmetric-group codes for the Gaussian channel. — *R. E. Blahut*: Bounds of the Fano-Kullback type. — *D. E. Bloekee*: An extension of the Fisher information measure. — *B. Bouchon*: An application of the theory of questionnaires to information theory. — *S. Csibi*: Using indicators as a base for estimating optimal decision functions. — *J. Dénes & E. Gergely*: Groupoids and codes. — *A. G. Djackov*: On a search model of false coins. — *P. Elias*: An information-theoretic approach to computational complexity. — *A. Ephremides*: A non-standard approach to stochastic point process control and games. — *P. Erdös & P. Révész*: Graphs and symbolic dynamics. — *G. Gábor*: The ϵ -NN method. A sequential feature selection for nearest neighbor decision rule. — *R. M. Gray*: Block, sliding-block, and trellis source coding. — *S. S. Gupta & W.-Y. Wong*: Subset selection procedures for finite schemes in information theory. — *E. Györfi*: A coding-decoding algorithm for the correction of additive and synchronization errors. — *L. Györfi & Z. Györfi*: On the nonparametric estimate of a posteriori probabilities of simple statistical hypotheses. — *L. Györfi & T. Nemetz*: f -dissimilarity: a general class of separation measures of several probability measures. — *B. Harris*: The statistical estimation of entropy in the non-parametric case. — *J. Justesen*: Information rate and source coding of context free languages. — *T. Kasami, S. Lin & S. Yamamura*: Further results on coding for a multiple-access channel. — *V. N. Koselev*: Linear and enumerative approaches to the noiseless coding of discrete sources. — *J. Körner & K. Marton*: Comparison of two noisy channels. — *R. E. Kricevskii & V. K. Trofimov*: Optimal coding of unknown and inaccurately known sources. — *F. Liese*: On the existence of f -projections. —

K. Marton : Conditionally independent discrete sources and the Wyner-Ziv bound. — *T. Nemetz & J. Simon* : Self-information and optimal codes. — *F. Oesterreicher* : On optimal solutions for a statistical model. — *F. Oesterreicher & N. Kusolitsch* : On least favourable tuples for a decision model. — *E. Pfaffelhuber* : Minimax information gain and minimum discrimination principle. — *V. Pless* : Two encryption schemes for computer confidentiality. — *D. Pötschke* : On the “classical” approach to the Shannon transmission problem. — *J. P. M. Schalkwijk & A. J. Vinck* : On a syndrome decoder for binary rate. — 1/2 convolutional codes. — *Ju. M. Star'kov* : Coding of discrete sources with unknown statistics. — *E. Szilléry* : Upper bounds for the Bayesian error probability. — *V. A. Zinov'ev* : On generalized concatenated codes.

J. HAMMER. — **Unsolved problems concerning lattice points.** — Research notes in mathematics, vol. 15. — Un vol. broché, 17 × 25, de 101 p. — Prix: £5.00. — Pitman, London/San Francisco/Melbourne, 1977.

Theorems of Minkowski and relatives : Conjectures of Ehrhart. A theorem of Sawyer. A reformulation of Minkowski’s theorem. Santalo’s problem on covering sets. Minkowski’s theorem for particular sets. The definition of a general lattice and some of its properties. On a conjecture of Minkowski. Analogous theorems to Minkowski’s using different geometric parameters. Results and problems on general convex sets and lattice points. On Minkowski-Hlawka theorem. On packing, covering and partition. Minkowskian arrangements. Theorem of successive minima. The polar reciprocal. Star bodies. Sets containing a given number of lattice points. Lattice points on the boundary of a body. Baker’s theorem. Visible lattice points. Functionals. — *Combinatorial problem* : Pick’s theorem. Lattice-polyhedron. Lattice-graphs. Theorems on point-sets. Ramsey-type theorems. Probabilistic problems. — *Compactness theorems. Abstract lattices* : Mahler’s compactness theorem. Séquences of lattice arrangements. Abstract lattices. Minkowski’s theorem in abstract lattices.

W. E. FITZGIBBON III & H. F. WALKER, editors. — **Nonlinear diffusion.** — Research notes in mathematics, vol. 14. — Un vol. broché, 17 × 25, de 232 p. — Prix: £7.50. — Pitman, London/San Francisco/Melbourne, 1977.

[Conference held at the University of Houston in June 1976]. *D. G. Aronson* : The asymptotic speed of propagation of a simple epidemic. — *J. R. Cannon and R. E. Ewing* : Galerkin procedures for systems of parabolic partial differential equations related to the transmission of nerve impulses. — *E. D. Conway and J. A. Smoller* : Diffusion and the classical ecological interactions: asymptotics. — *J. W. Evans* : Transition behavior at the slow and fast impulses. — *P. C. Fife* : Stationary patterns for reaction-diffusion equations. — *D. Henry* : Gradient flows defined by parabolic equations. — *N. J. Kopell* : Waves, shocks and target patterns in an oscillating chemical reagent. — *R. M. Miura* : A nonlinear WKB method and slowly-modulated oscillations in nonlinear diffusion processes. — *P. Nelson* : Subcriticality for submultiplying steady-state neutron diffusion. — *J. Rinzel* : Repetitive nerve impulse propagation: numerical results and methods. — *M. E. Schonbek* : Some results on the FitzHugh-Nagumo equations. — *A. D. Snider and D. L. Akins* : Calculation of transients for some nonlinear diffusion phenomena.

Walter LEDERMANN. — **Introduction to group characters.** — Un vol. broché, 15,5 × 23, de VIII, 174 p. — Prix: £3.30. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Group representations: Introduction. G -modules. Characters. Reducibility. Permutation representations. Complete reducibility. Schur's lemma. The commutant (endomorphism) algebra. — *Elementary properties of group characters*: Orthogonality relations. The group algebra. The character table. Finite abelian groups. The lifting process. Linear characters. — *Induced characters*: Induced representations. The reciprocity law. The alternating group A_5 . Normal subgroups. Tensor products. Mackey's theorem. — *Permutation groups*: Transitive groups. The symmetric group. Induced characters of S_n . Generalised characters. Skew-symmetric polynomials. Generating functions. Orthogonality. The degree formula. Schur functions. Conjugate partitions. The characters of S_5 . — *Group-theoretical applications*: Algebraic numbers. Representations of the group algebra. Burnside's (p, q) -theorem. Frobenius groups. — *Appendix*: A generalisation of Vandermonde's determinant. The alternant quotient. Jacobi's theorem on inverse matrices.

Jean-Pierre LAFON. — **Algèbre commutative. Langages géométrique et algébrique.** — Collection « Enseignement des sciences », vol. 24. — Un vol. broché, $16,5 \times 24$, de 454 p. — Prix: FF 68.00. — Hermann, Paris, 1977.

Anneaux et modules de fractions — localisation et globalisation: Parties multiplicatives. Anneaux et modules de fractions. Sous-modules de modules de fractions. Changement de parties multiplicatives. Le principe de globalisation. Modules de fractions, produit tensoriel et modules Hom. — *Conditions de chaînes et de finitude*: Modules noethériens et artiniens. Anneaux noethériens. Modules de longueur finie. Anneaux artiniens. Généralités sur les anneaux factoriels. — *Idéaux premiers associés. Décomposition primaire*: Idéaux premiers associés. Décomposition primaire. Support, idéaux premiers associés et changement d'anneaux. — *Extensions d'anneaux. Dépendances algébrique et intégrale*: Eléments transcendants, algébriques, entiers. Interprétation de la notion d'entier en termes de places ou de valuations. Anneaux intégralement clos. — *Eléments de théorie des corps commutatifs*: Extensions algébriques et transcendantes. Construction de quelques extensions remarquables. Eléments de théorie de Galois des extensions finies. Extensions inséparables. — *Eléments de géométrie algébrique*: Eléments de géométrie algébrique affine. Spectre d'un anneau. Spectre maximal. Anneaux de Jacobson. Eléments de géométrie algébrique projective. — *Homomorphismes d'anneaux et morphismes d'ensembles algébriques*: Fibres d'un homomorphisme d'anneaux. Cas d'un homomorphisme entier. Algèbres de type fini sur un corps. Lemme de normalisation. Ensembles constructibles. Définition et caractérisation. — *Topologies a -adiques. Complétion*: Filtrations. Lemme d'Artin-Rees. Complétion. Propriétés de transfert. Quasi-finitude et finitude. Le critère local de platitude. — *Dérivations et différentielles*: Définition des dérivations et différentielles. Propriétés et calculs des modules de dérivations et différentielles. Extensions séparables. — *Appendice: Espaces spectraux*: La topologie constructible. Sources. Conclusion.

B. S. GARBOW, J. M. BOYLE, J. J. DONGARRA, C. B. MOLER. — **Matrix eigensystem routines — EISPACK guide extension.** — Lecture notes in computer science, vol. 51. — Un vol. broché, 17×25 , de VIII, 343 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Introduction: Organization of the guide. Accuracy of the EISPACK subroutines. — *How to use EISPACK*: Recommended basic paths in EISPACK. Variations of the recommended EISPACK paths. Additional information and examples. Singular value decomposition with EISPACK. — *Validation of EISPACK*. — *Execution times for*

EISPACK: Tables of execution times. Repeatability and reliability of the measured execution times. Dependence of the execution times upon the matrix system. Extrapolation of timing results to other machines and compilers. Timing considerations for band problems and singular value decomposition. — *Certification and availability of EISPACK*. — *Differences between the EISPACK subroutines and the handbook ALGOL procedures*. — *Documentation and source listings*: EISPACK subroutines. EISPACK CONTROL PROGRAM.

C. BANICA, et O. STANASILA. — **Méthodes algébriques dans la théorie globale des espaces complexes**-Vol. I. — Collection « Varia mathematica ». — Un vol. broché, 16 × 24, de x, 190 p. — Gauthier-Villars, Paris (Diffusé en Suisse par SPES, Lausanne), 1977.

Rappel sur les espaces complexes. — *La cohomologie à support compact sur les espaces de Stein*: La dualité sur les variétés de Stein. La dimension et la profondeur d'un faisceau analytique cohérent. Applications. — *Cohomologie locale analytique*: Les ensembles singuliers des faisceaux cohérents. Le théorème d'annulation. Le théorème de finitude. La cohomologie locale absolue. Le théorème de séparation. — *Morphismes propres d'espaces complexes*: Le théorème de finitude. Les théorèmes de comparaison et de changement de base. Les théorèmes de semi-continuité et de continuité. L'invariance de la caractéristique d'Euler-Poincaré. — *Morphismes projectifs d'espaces complexes*: Le comportement à $+\infty$ des faisceaux $\mathcal{F}(m)$. Le comportement à $-\infty$ des faisceaux $\mathcal{F}(m)$. Deux critères d'amplitude.

David MUMFORD. — **Stability of projective varieties**. — Lectures given at the Institut des hautes études scientifiques, Bures-sur-Yvette (France), March-April 1976, under the sponsorship of the International Mathematical Union. — Notes by Ian Morrison. — Monographies de l'Enseignement Mathématique, n° 24. — Un vol. broché, 16 × 24, de 74 p. — Prix: FS 21.00. — Université de Genève, L'Enseignement Mathématique, Genève, 1977.

Introduction. — Stable points of representations, examples and Chow forms. — A criterion for $X^r \subset P^n$ to be stable. — Effect of singular points on stability. — Asymptotic stability of canonically polarized curves. — The moduli space of stable curves. — Bibliography.