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Ian STEWART and David TALL. — **The foundations of mathematics.** — Un vol. broché, 13,5 × 21,5. — Prix: £3.95. — Oxford University Press, Oxford, 1977.

The intuitive background: Mathematical thinking. Number systems. — *The beginnings of formalization*: Sets. Relations. Functions. Mathematical logic. Mathematical proof. — *The development of axiomatic systems*: Natural numbers and proof by induction. The real numbers. The real numbers as a complete ordered field. Complex number and beyond. Cardinal numbers. — *Strengthening the foundations*: Axioms for set theory.

Jérôme CHASTENET DE GERY. — **Exercices et problèmes de mathématiques.** — Sur l'algèbre linéaire, la représentation des fonctions par des limites, séries et intégrales, l'analyse vectorielle et les intégrales multiples, les systèmes différentiels et les équations aux dérivées partielles. — Nouv. éd. revue et corrigée. — Un vol. broché, 15 × 21, de 171 p. — Société d'édition d'enseignement supérieur (SEDES), Paris (Diffusé en Suisse par SPES, Lausanne), 1977.

Algèbre et algèbre linéaire: Ensembles, applications, opérations, espaces vectoriels, dimension finie ou infinie, applications linéaires, dual, matrices, déterminants, systèmes linéaires, réduction des matrices, formes quadratiques, espaces euclidiens, espaces affines. Enoncés des problèmes. Textes des solutions. — *Représentation des fonctions*: Convergence et convergence uniforme de familles, suites, séries et intégrales de fonctions. Dérivabilité et intégrabilité. Cas des séries entières et des séries trigonométriques. Convergence absolue et semi-convergence. Calcul numérique approché. Séries et intégrales de Fourier. Convolution. Transformation de Laplace et calcul symbolique. Enoncés des problèmes. Textes des solutions. — *Analyse vectorielle et intégrales multiples*: Intégrales multiples, changements de variables et coordonnées curvilignes, intégrales de courbes et de surfaces, circulation et flux. Intégrales multiples généralisées. Gradient, divergence, rotationnel, laplacien. Formule d'Ampère-Stokes et d'Ostrogradski. Champs de gradients, champs de rotationnels, champs newtoniens. Angles solides. Enoncés des problèmes. Textes des solutions. — *Systèmes différentiels et équations aux dérivées partielles*: Systèmes différentiels, intégrales premières. Systèmes différentiels linéaires, à coefficients constants ou non; variation des constantes, calcul symbolique. Equations aux dérivées partielles du premier ordre, quasi-linéaires; formes différentielles, facteurs intégrants. Equations aux dérivées partielles d'ordre supérieur; séparation des variables; problème de Dirichlet, équation des cordes vibrantes. Enoncés des problèmes. Textes des solutions.

A. E. BROUWER. — **Treelike spaces and related connected topological spaces.** — Mathematical Centre tracts, vol. 75. — Un vol. broché, 16×24 , de iv, 109 p. — Prix: DFL 14.00. — Mathematisch centrum, Amsterdam, 1977.

Preliminaries. — On V -spaces. — On W -spaces. On treelike spaces. — Classification on the connected topological spaces that cannot be broken up into more than two components by removal of a connected subset.

E. DE JONGE, A. C. M. VAN ROOIJ. — **Introduction to Riesz spaces.** — Mathematical Centre tracts, vol. 78. — Un vol. broché, ix, 229 p. — Prix: DFL 24.00. — Mathematisch Centrum, Amsterdam, 1977.

Riesz spaces: Preliminaries. Riesz subspaces and Riesz homomorphisms. Disjointness. Archimedean and Dedekind complete Riesz spaces. — *The order dual*: Order bounded linear functionals. Extension theorems. Integrals and singular functionals. Annihilators and absolutely continuous elements. — *Normed Riesz spaces*: Normed Riesz spaces. Dual spaces. Bounded integrals and bounded singular functionals. — *Representation theorems*: The Riesz space $C(X)$. The Yosida representation theorem. The Riesz space $B(X)$. The Riesz space $C^\infty(X)$. L -spaces and M -spaces. Hermitian operators. — *Normed Köthe spaces*: Function semi-norms and Köthe spaces. Banach function spaces. Orlicz spaces. Useless sets and saturated function semi-norms. Associate function semi-norms. The first associate space of an Orlicz space. The dual of an Orlicz space. — The dual space of L_∞ . The second associate norm.

Complex analysis and algebraic geometry: a collection of papers dedicated to K. Kodaira — Edited by W. L. Baily, Jr. and T. Shioda. — Un vol. relié, 18×26 , de xii, 401 p. — Prix: £28.00. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Introduction (by K. Ueno and T. Shioda). — *Part I*: *M. Artin*: Coverings of the rational double points in characteristic p . *E. Bombieri and D. Mumford*: Enriques' classification of surfaces in Char. p . II. *F. Hirzebruch and D. Zagier*: Classification of Hilbert modular surfaces. *E. Horikawa*: On algebraic surfaces with pencils of curves of genus 2. *M. Inoue*: New surfaces with no meromorphic functions, II. *A. Kas*: On the deformation types of regular elliptic surfaces. *Y. Miyaoka*: On numerical Campedelli surfaces. *T. Shioda and H. Inose*: On singular $K3$ surfaces. *G. van der Geer and A. Van de Ven*: On the minimality of certain Hilbert modular surfaces. — *Part II*: *K. Akao*: Complex structures on $S^{2p+1} \times S^{2q+1}$ with algebraic codimension 1. *T. Fujita*: Defining equations for certain types of polarized varieties. *S. Iitaka*: On logarithmic Kodaira dimension of algebraic varieties. *Ma. Kato*: On a characterization of submanifolds of Hopf manifolds. *I. Nakamura*: Relative compactification of the Néron model and its application. *Y. Namikawa*: Toroidal degeneration of abelian varieties. *F. Sakai*: Kodaira dimensions of complements of divisors. *T. Suwa*: Compact quotients of \mathbb{C}^3 by affine transformation groups, II. *K. Ueno*: Kodaira dimensions for certain fibre spaces. — *Part III*: *A. Andreotti and M. Nacinovich*: Some remarks on formal Poincaré lemma. *W. L. Baily, Jr.*: Special arithmetic groups and Eisenstein series. *H. Goldschmidt and D. Spencer*: Submanifolds and over-determined differential operators. *J. Igusa*: On the first terms of certain asymptotic expansions. *M. Kashiwara*: Micro-local calculus of simple microfunctions. *S. Kawai*: A note on Steenrod reduced powers of algebraic cocycles. *N. Sasakura*: Polynomial growth C^∞ — de Rham cohomology and normalized series of prestratified spaces.

Norman BIGGS. — **Interaction models.** — Course given at Royal Holloway College, University of London, October-December 1976. — London Mathematical Society lecture note series, vol. 30. — Un vol. broché, 16 × 23, de 101 p. — Prix: £4.50. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Preview: Apologia. States on a graph. Interaction models. Physical background. Transition points. Notes and references. — *Methods:* Resonant models. The transfer matrix. Applications of the trace formula. Correlation functions. Notes and references. — *Duality:* Flows on a graph. Dual models. The algebraic duality theorem. Planarity and duality. Transition points for planar graphs. Notes and references. — *Expansions:* Graph types. The subgraph counting problem. The cluster expansion. Subgraph expansions revisited. Vertex-transitive graphs. Notes and references. — *Prospects:* Symmetry and dimensionality. The eigenvalue method in two dimensions. Existence of long-range order. Notes and references. — *Appendix A:* Distributive identities. — *Appendix B:* The Perron-Frobenius theorem.

Heinz RUTISHAUSER. — **Numerische Prozeduren aus Nachlass und Lehre.** — Hrsg. von Walter Gander, Luciano Molinari, Hana Svecova. — International series of numerical mathematics = Internationale Schriftenreihe zur Numerischen Mathematik = Série internationale d'analyse numérique, vol. 33. — Un vol. broché, 16,5 × 24, de 127 p. — Prix: FS 48.00. — Birkhäuser Verlag, Basel/Stuttgart, 1977.

W. Gander: Latteninterpolation (Prozedur *lataeq*). — *H. Svecova:* Auflösung linearer Gleichungssysteme (Prozedur *liglei*). — *L. Molinari:* Vermittelnde Ausgleichung (Prozedur *vermag*). — *L. Molinari:* Schmidt'sches Orthogonalisierungsverfahren (Prozedur *orthno*). — *W. Gander:* Stationärer Quotienten-Differenzen-Algorithmus (Prozedur *qdstat*).

Numerik und Anwendungen von Eigenwertaufgaben und Verzweigungsproblemen. — Vortragsauszüge der Tagung über Numerik und Anwendungen von Eigenwertaufgaben und Verzweigungsproblemen vom 14. bis 20. November 1976 im Mathematischen Forschungsinstitut Oberwolfach (Schwarzwald). — Hrsg. von E. Bohl, L. Collatz, K.P. Haderler. — Un vol. broché, 16,5 × 24, de 218 p. — Prix: FS 42.00, — Birkhäuser Verlag, Basel/Stuttgart, 1977.

L. Collatz: Verzweigungsdiagramme und Hypergraphen. — *P. Lancaster:* A review of numerical methods for eigenvalue problems nonlinear in the parameter. — *W. Mackens:* Ein Quotienteneinschluss bei Spline-Eigenwertaufgaben. — *P. de Mottoni:* Stability of the positive equilibrium solution for a class of quasilinear diffusion equations. — *W.R. Richert:* Über Intermediateprobleme erster Art. — *G.F. Roach:* Variational methods for multiparametric eigenvalue problems I. — *F. Stummel:* Approximation methods for eigenvalue problems in elliptic differential equations. — *A. Tesei:* Asymptotic stability results for a system of diffusion equations. — *H. J. Wacker:* Bemerkungen zur Aufwandminimierung bei Stetigkeitsmethoden sowie Alternativen bei der Behandlung der Singulären Situation. — *H. J. Weinitschke:* Verzweigungsprobleme bei kreisförmigen elastischen Platten. — *W. Wetterling:* Quotientenschliessung bei Eigenwertaufgaben mit partieller Differentialgleichung.

Jürg T. MARTI. — **Konvexe Analysis.** — Lehrbücher und Monographien aus dem Gebiete der exakten Wissenschaften. Mathematische Reihe, Band 54. — Un vol. relié, 17 × 25, de XI, 273 p. — Prix: FS 68.00. — Birkhäuser Verlag, Basel/Stuttgart, 1977.

Konvexe Mengen in reellen Vektorräumen: Konvexe Mengen. Die konvexe Hülle. Konvexe Kegel. Der erste Trennungssatz. — *Konvexe Mengen in topologischen Vektorräumen:* Das Innere und die Abschliessung von konvexen Mengen. Die abgeschlossene konvexe Hülle. Der zweite Trennungssatz. Die Trennungssätze als Grundlage für Existenzsätze aus der mathematischen Oekonomie. — *Extreme Punkte:* Extremale Teilmengen und extreme Punkte. Extreme Punkte der konvexen Hülle. Darstellung konvexer Mengen als konvexe Hülle von Teilmengen (Satz von Krein-Milman). — *Extrempunktsätze für $C(S)$ und Anwendung auf die Approximationstheorie:* Der Satz von Banach-Stone. Charakterisierung bester Approximationen in normierten Vektorräumen. Der Charakterisierungssatz von Kolmogoroff für beste Approximationen im Banachraum $C(S)$. Eine Charakterisierung des Banachraumes $L_\infty(S, \Sigma, \mu)$. — *Stützpunkte:* Stützpunkte und Stützfunktionale konvexer Mengen. Konvexe Mengen trennende Stützfunktionale. Beispiele konvexer Mengen, für die nicht jeder Randpunkt ein Stützpunkt ist. Stützpunkte von konvexen Mengen in Fréchetverbänden. Stützkegel und Normalenkegel. — *Exponierte Punkte:* Einige Eigenschaften exponierter Punkte. Der Zusammenhang zwischen den exponierten und den extremalen Punkten von konvexen Mengen im \mathbb{R}^n . Strikt konvexe Mengen. — *Reguläre Punkte:* Die Tangentenfunktionale von absorbierenden konvexen Mengen. Eigenschaften der regulären Punkte. Zu glatten strikt konvexen Vektorräumen topologisch isomorphe Räume. Nächste und weiteste Punkte. Dichtheitseigenschaften der Menge der exponierten Punkte. — *Fixpunktsätze und Anwendungen:* Der Brouwersche Fixpunktsatz. Der Schauder-Tychonoffsche Fixpunktsatz. Anwendung auf Probleme der Approximationstheorie. Anwendung auf Anfangs- und Randwertprobleme. — *Charakterisierung konvexer Mengen:* Motzkinsche Mengen. Charakterisierung konvexer Mengen durch reguläre Punkte. — *Konvexe Funktionen auf \mathbb{R}^n :* Die Stetigkeit konvexer Funktionen. Konvergenz von Folgen von konvexen Funktionen. Differenzierbarkeit und Konvexität. Minima von konvexen Funktionen. Konvexe Erweiterung konvexer Funktionen. — *Konvexe und sternförmige Mengen in \mathbb{R}^n :* Der Satz von Carathéodory. Durchschnittseigenschaften von konvexen Mengen in \mathbb{R}^n . Anwendung auf Systeme von Ungleichungen. Sternförmige Mengen. Überdeckung von beschränkten Mengen mit konvexen Mengen in \mathbb{R}^n . — *Der Raum der kompakten konvexen Teilmengen von \mathbb{R}^n :* Die Hausdorffsche Metrik. Der Auswahlssatz von Blaschke. — *Approximation von konvexen Mengen in \mathbb{R} :* Approximation durch konvexe Polyeder. Approximation durch reguläre konvexe Mengen. Volumen und Oberfläche konvexer Mengen. — *Anhang:* Geordnete topologische Vektorräume.

Stanley H. BENTON, Jr. — **The Hamilton-Jacobi equation: a global approach.** — Mathematics in science and engineering, vol. 131. — Un vol. relié, 16 × 24, de XI, 147 p. — Prix: \$13.50. — Academic Press, New York/San Francisco/London, 1977.

Classical methods: Exact equations and direct integration. The general solution. Separation of variables. Characteristics and integral surfaces. The complete integral. The Cauchy-Kowalewski theorem. The Legendre transform. Characteristic theory. Elementary transformations. Variational methods. Hamilton-Jacobi theory. Contact transformations. Similarity methods. — *Existence:* Global solutions. The compatibility condition. The variational solution. Growth conditions. Regularity. Space-time independent Hamiltonians. Space-time dependence. Equivalent problems. A little μ dependence? Other existence techniques. — *Uniqueness and properties of solutions:*

Basic inequalities. Uniqueness for the Cauchy problem. Uniqueness for more general boundaries. Maximality of the variational solution. — *Applications and numerical methods* : Some physical applications. Applications in the calculus of variations and control theory. Minimization of a function. Quasilinear equations. Numerical methods for the calculus of variations. Numerical methods for first-order equations. Artificial viscosity.

Heinz-Dieter EBBINGHAUS. — **Einführung in die Mengenlehre.** — Die Mathematik. — Un vol. broché, $13,5 \times 21,55$, de XIII, 177 p. — Prix: DM 46.00. — Wissenschaftliche Buchgesellschaft, Darmstadt, 1977.

Einleitung : Der naive Mengenbegriff. Die Bedeutung der Mengenlehre für die Mathematik. Ein geschichtlicher Rückblick. Zur Tragweite mengentheoretischer Axiomensysteme. — *Der darstellerische Rahmen* : Vorbemerkungen. Die mengentheoretische Sprache. Prädikate und Operationen. — *Die Axiome von Zermelo* : Das Extensionalitätsaxiom und das Schema der Aussonderungsaxiome. Boolesche Operationen. Die Vereinigungsmengenaxiome. Das Potenzmengenaxiom. Das unendlichkeitsaxiom. Ein Kommentar. — *Relationen und Funktionen* : Paarmengen und geordnete Paare. Metasprachliche Induktionen. Relationen und kartesische Produkte. Funktionen. Familien und Strukturen. — *Natürliche Zahlen* : Definition der mengentheoretischen natürlichen Zahlen. Peano-Strukturen. Ein Induktionsprinzip. Das ω -Rekursionstheorem. Endliche Mengen und arithmetische Verknüpfungen. — *Wohlordnungen und Ordinalzahlen* : Wohlordnungen. Ordinalzahlen. Nachfolger- und Limeszahlen. — *Ersetzung und Rekursion* : Das Schema der Ersetzungsaxiome. Fundierte Relationen. Das f -Rekursionstheorem. Anwendungen. Das Lemma von Mostowski. Das O -Rekursionstheorem. Eine Anwendung: die von Neumannsche Hierarchie. — *Das Auswahlaxiom* : Eine Formulierung des Auswahlaxioms. Der Wohlordnungssatz. Das Zornsche Lemma. — *Mächtigkeiten* : Mächtigkeitsbetrachtungen ohne Auswahlaxiom. Mächtigkeitsbetrachtungen mit Auswahlaxiom. Kardinalzahlarithmetik. — *Fundiertheit* : Ein Überblick. Die von Neumannsche Hierarchie und das Fundierungsaxiom. — *Reflektionen* : Relativierungen und Absolutheit. Das Reflektionsprinzip. — *Das Scottsche Axiomensystem der Mengenlehre* : Die Formulierung. Eine Diskussion. Die Gleichwertigkeit von Σ und ZFF . — *Axiomatisierung und Widerspruchsfreiheit* : Das Problem der Widerspruchsfreiheitsbeweise. Relative Widerspruchsfreiheitsbeweise. Eine abschliessende Diskussion.

C. BANICA et O. STANASILA. — **Méthodes algébriques dans la théorie globale des espaces complexes, vol. 2.** — Collection « Varia mathematica ». — Un vol. broché, 16×24 , de 183 p. — Gauthier-Villars, Paris (Diffusé en Suisse par SPES, Lausanne), 1977.

Morphismes plats d'espaces complexes : Préliminaires. Propriétés algébriques et propriétés topologiques des morphismes plats. Un théorème de noethérianité relativement aux compacts de Stein. L'ensemble des points de platitude d'un morphisme. — *Le complété formel d'un espace complexe relatif à un sous-ensemble analytique* : Préliminaires. La définition et les propriétés élémentaires du complété formel. Un théorème de finitude. Le théorème de comparaison. — *La dualité sur les espaces complexes* : Préliminaires. Construction du complexe dualisant. Théorèmes de dualité absolue. La dualité sur les variétés complexes. Les faisceaux dualisants. — *Prolongement des faisceaux analytiques cohérents* : Préliminaires. Le cas des compacts holomorphiquement convexes. Le cas des espaces normaux.

Peter HENRICI, Rita JELTSCH. — **Komplexe Analysis für Ingenieure, Band I.** — UTB: Uni-Taschenbücher, Band 627. — Un volume broché, $12 \times 18,5$, de 160 p. — Prix: FS 17.00. — Birkhäuser-Verlag, Basel/Stuttgart, 1977.

Komplexe Funktionen einer komplexen Variablen: Begriff und geometrische Deutung. Die linearen Funktionen. Die quadratische Funktion. Die komplexe Exponentialfunktion. Die Umkehrfunktion. Der komplexe Logarithmus, allgemeine Potenzen. Die Joukowski-Funktion. — *Die Möbius-Transformationen*: Die Riemannsche Zahlenkugel. Geometrische Eigenschaften der Möbius-Transformationen. — *Analytische Funktionen*: Komplexe Differenzierbarkeit. Analytische Funktionen. Geometrische Deutung der komplexen Differenzierbarkeit. — *Lösung ebener Potentialprobleme durch konforme Abbildung*: Konforme Verpflanzung von Potentialen. Ebene elektrostatische Felder. Ebene stationäre Strömungen idealer inkompressibler Flüssigkeiten.

O. M. PHILLIPS. — **The dynamics of the upper ocean.** — 2nd edition. — Cambridge monographs on mechanics and applied mathematics. Un vol. relié, 15×23 , de VIII, 336 p. — Prix: £16.00. — Cambridge University Press, Cambridge/London/New York/Melbourne, 1977.

Introduction: The ocean environment. The development of the subject. — *The equations of motion*: Specification of the motion. The equations of motion. The mechanical energy equation. The Boussinesq approximation. The Reynolds stresses. The kinematics of wave trains. The dynamics of wave trains in moving media. Wave-wave interactions. — *The dynamics of surface waves*: The governing equations. Infinitesimal waves. Particle motions in irrotational flow. The influence of molecular viscosity. Wave refraction. The dynamical conservation equations. Some applications. Surface wave interactions. Wave breaking. — *Ocean surface waves*: The specification of a wave field. The generation of waves by wind. The coupling between wind and waves. Wave interactions. The saturation range. The development of the spectrum. Ripples and short gravity waves. Wave propagation. The probability structure of the surface. The air flow over the sea. — *Internal waves*: Introduction. Infinitesimal waves. The lowest internal mode. The degradation of the lowest internal mode. Small scale internal waves. Oceanic propagation of internal waves. Low frequency oscillations. Internal wave spectra with general mode structure. The generation of internal waves. — *Oceanic turbulence*: The occurrence of turbulence. The energy equation for the turbulence. The spectrum of turbulence. Local similarity theory. The spectra of temperature and salinity fluctuations. Turbulence in the surface layer. Thermocline erosion.

Zofia SZMYDT. — **Fourier transformation and linear differential equations.** — Translated from the Polish by Marcin E. Kuczma. — Un vol. relié, 16×23 , de XIX, 502 p. — Prix: DFL 85.00. — D. Reidel Publishing Company, Dordrecht/Boston — PWN-Polish Scientific Publishers, Warszawa, 1977.

Introduction: Terminology and notation. Vector spaces with convergence defined by a sequence of semi-norms. Spaces of continuous linear functionals. Test functions and regularization. Basic definitions of the theory of distributions. Differentiation of distributions. Pseudo-functions. Sequences of Type δ . Certain mappings of \mathcal{D} into \mathcal{D}' . The space \mathcal{E}' of distributions with bounded supports. Approximation of functions in the space $\mathcal{D}(E^{m+n})$. Generalization of integrals depending on a parameter. The primitives of a distribution. Distributions regarded as the derivatives of continuous functions. Distri-

bution-valued functions. Operation of fixing variables in a distribution. The tensor product of distributions. Convolution of distributions. Series of distributions. Periodic distributions on E^1 . — *Fourier transformation. Tempered distributions*: Fourier transformation in the class \mathcal{S} of rapidly decreasing functions. The space \mathcal{S}' of tempered distributions. Operation of tempered fixing variables in a distribution. Fourier transformation in the class \mathcal{S}' . Computation of certain Fourier transforms. The role of the Fourier transformation in differential equations with constant coefficients. The Fourier transform of periodic distributions. — *Linear differential equations*: Definitions and methods. Ordinary differential equations with a parameter. Differential equations solved with respect to the highest order derivative of one of the variables. — *The wave equation*: The wave operator \square_n . Initial value problems. Solution of the initial value problem for the equation $\square_3 u = 0$ and a fundamental solution of the operator \square_3 . Solution of the initial value problem for the equation $\square_3 u = f$. The equation of vibrating membrane. The equation of vibrating string. — *The heat equation and Schrödinger equation*: Solution of the distributional initial value problem for the homogeneous heat equation. Distributional initial value problem for the non-homogeneous heat equation. Uniqueness of solution of the initial value problem for the heat equation in the class \mathcal{S}' . Certain classical topics concerning the heat equation. Schrödinger's equation. — *Laplace, Poisson, and Helmholtz equations*: Laplace equation. Distributions invariant with respect to rotations. Fundamental solution of the Laplace operator. Properties of harmonic functions. Poisson's equation. The Helmholtz operator. Half-space problem for the Laplace equation. The Dirichlet problem for the Laplace equation in the disc. *Appendix: Fundamental solution of the wave operator*: The group G of proper Lorentz transformations and G — invariant distributions (by Z. Szmydt and B. Ziemian). Fundamental solution E_n of the operator \square_n for $n > 3$ (by Z. Szmydt and B. Ziemian).

Daniel A. MARCUS. — **Number fields.** — Universitext. — Un vol. broché, $16,5 \times 24$, de VIII, 279 p. — Prix: DM 26.10. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

A special case of Fermat's conjecture. — Number fields and number rings. — Prime decomposition in number rings. — Galois theory applied to prime decomposition. — The ideal class group and the unit group. — The distribution of ideals in a number ring. — The Dedekind zeta function and the class number formula. — The distribution of primes and an introduction to class field theory. — Commutative rings and ideals. — Galois theory for subfields of \mathbb{C} . — Finite fields and rings. — Two pages of primes. — Bibliography. — Index. — Index of theorems. — List of symbols.

Morris SCHREIBER. — **Differential forms: a heuristic introduction.** — Universitext. — Un vol. broché, $16,5 \times 24$, de X, 147 p. — Prix: DM 21.40. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Partial differentiation: Partial derivatives. Differentiability, chain rule. Taylor's theorem. — *Differential form*: Line integrals. One forms. Wedge product. Change of coordinates. — *Integration in higher dimensions*: Jacobians. Implicit function theorem. Manifolds. Integration on manifolds. — *Exterior differentiation*: Exterior derivative. Fundamental theorem of calculus. Closed forms. Exact forms. — *Vector operations in \mathbb{R}^3* : Nabla. Higher derivatives. Integral formulae. — *Extremals*: Generic extremals. Extremals with constraints. — *Integral geometry*: Measure of points and lines. Kinematic measure. Formulae of Poincaré and Blaschke. — *Appendix*: The volume element on a manifold. The algebra of forms. A remark on curl curl.

Michel METIVIER. — **Reelle und Vektorwertige Quasimartingale und die Theorie der stochastischen Integration.** — Lecture notes in mathematics, vol. 607. — Un vol. broché, 17 × 24, de IX, 310 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Einführung in die Theorie der stochastischen Integration. Der stetige Fall: Einleitung: das Grundproblem der stochastischen Integration. Das Doleansmass eines Prozesses. Über den Doob-Meyerschen Zerlegungssatz. Quadratintegrierbare reelle Martingale. Das L^2 -stochastische Integral. Das L^0 -stochastischen Integral. Die quadratische Variation und die Ito-Formel. Die Ito-Formel und Anwendungen. Der Begriff der stochastischen Differentialgleichung. Das stochastische Integral für Hilbertsche Prozesse (Kunita's integral). Die Quadrattensorvariation eines Hilbertwertigen lokalen L^2 -Martingals. — *Grundlegende Begriffe für Prozesse*: Allgemeine Definitionen. Gutmessbare und vorhersehbare Prozesse. Stopzeiten. Die σ -Algebren \mathcal{F}_T und \mathcal{F}_{T-} . Zulässige Masse. Zerlegungssatz für Stopzeiten. — *Martingale und Quasimartingale*: Martingale, Submartingale, Supermartingale, Quasimartingale und elementare Eigenschaften. Doobsche Ungleichungen für reelle Quasimartingale. Gleichmässige Integrierbarkeit, L^p -Konvergenzsatz, Regularitätseigenschaften der Pfade. Konvergenzeigenschaften für vektorwertige Quasimartingale. Das Doleansmass eines $[L.D.]$ -Quasimartingale. Die vorhersehbare Projektion eines Prozesses und die duale vorhersehbare Projektion eines zulässigen Masses. Der vorhersehbare E.V.-Prozess eines zulässigen Masses auf \mathcal{P} und die Doob-Meyersche Zerlegung eines Quasimartingals. — *Das stochastische Integral bezüglich eines Semimartingals (reeller Fall)*: Räume von reellen L^2 -Martingalen, Die isotonen Prozesse und das zulässige Mass eines L^2 -Martingals. Das L^2 -stochastische Integral. Das stochastische Integral bezüglich eines Prozesses der Klasse Q und Q_{loc} und bezüglich eines Semimartingals. Der Transformationssatz (Ito, Watanabe, Skorokhod, Meyer, Doleans-Dade). — *Das Hilbertsche stochastische Integral*: Räume von H -wertigen L^2 -Martingalen. Die Prozesse $\langle M \rangle$, $\ll M \gg$, $[M]$ und $[[M]]$. Das L^2 -stochastische Integral. Das L^0 -stochastische Integral und der Transformationssatz. Der Begriff der stochastische Evolutionsgleichung — einige Literaturangaben.

Alain BIGARD, Klaus KEIMEL, Samuel WOLFENSTEIN — **Groupes et anneaux réticulés.** — Lecture notes in mathematics, vol. 608. — Un vol. broché, 17 × 24, de XIV, 334 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Préliminaires. — Notions fondamentales. — Sous-groupes solides. — Polaires. — Représentation des groupes réticulés. — Extensions archimédiennes. — Groupes complètement distributifs et groupes valués-finis. — Propriétés liées à l'orthogonalité. — Anneaux réticulés. — Anneaux réticulés produits sous-directs d'anneaux totalement ordonnés. — Le spectre et la représentation par des sections dans des faisceaux. — Groupes archimédiens et groupes complets. — Orthomorphismes et f -anneaux archimédiens. — Représentation par des fonctions numériques continues. — Groupes hyper-archimédiens et sommes directes de groupes réels. — Groupes réticulés libres. — Bibliographie.

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cations of ultrafilters to topology. — *A. Csaszar* : Some problems concerning $C(x)$. — *A. Deleanu and P. Hilton* : Generalized shape theory. — *V. A. Efremovic and A. G. Vainstein* : New results in uniform topology. — *J. Flachsmeyer* : Topologization of Boolean algebras. — *Z. Frolik* : Recent development of theory of uniform spaces. — *B. P. Johnson* : Stability of Banach algebras. — *I. Juhasz* : Two set-theoretic problems in topology. — *D. Maharam* : Category, Boolean algebras and measure. — *J. Nagata* : On rings of continuous functions. — *J. Pelant* : Combinatorial properties of uniformities. — *V. Ptak* : Nondiscrete mathematical induction. — *M. Rajagopalan* : Compact C -spaces and S -spaces. — *M. P. Rudin* : A narrow view of set theoretic topology. — *Ju. M. Smirnov* : Some topological aspects of the theory of topological transformation groups. — *A.H. Stone* : Measure-preserving maps. — *V. Trnkova* : Categorical aspects are useful for topology.

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Introduction. — The general theory: Contact. The Grassmann bundle. Adapted frames of a homogeneous space. Zeroth order frames of a submanifold. Lie transformation groups. First order frames. Second order frames. Third and higher order frames. Frenet frames. The role of the Maurer-Cartan form of G . Congruence and existence theorems. Homogeneity theorem. — Surfaces in \mathbf{R}^3 under $E(3)$. — Real curves in $\tilde{G}_{4,2}$ under $SO(4)$. — Holomorphic curves in Cp^2 under $SU(3)$. — Holomorphic curves in $CG_{4,2}$ under $SU(4)$. Surfaces in \mathbf{R}^3 under the special affine group.

Michael MAKKAI, Gonzalo E. REYES. — **First order categorical logic.** — Model-theoretical methods in the theory of topoi and related categories. — Lecture notes in mathematics, vol. 611. — Un vol. broché, 17×24 , de VIII, 301 p. — Prix: DM 31.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

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Two-dimensional manifolds: Introduction. Definition and examples of n -manifolds. Orientable vs. nonorientable manifolds. Examples of compact, connected 2-manifolds. Statement of the classification theorem for compact surfaces. Triangulations of compact surfaces. Proof of theorem 5.1. The Euler characteristic of a surface. Manifolds with boundary. The classification of compact, connected 2-manifolds with boundary. The Euler characteristic of a bordered surface. Models of compact bordered surfaces in Euclidean 3-space. Remarks on noncompact surfaces. — *The fundamental group*: Introduction. Basic notation and terminology. Definition of the fundamental group of a space. The effect of a continuous mapping on the fundamental group. The fundamental group of a circle is infinite cyclic. Application: the Brouwer fixed-point theorem in dimension 2. The fundamental group of a product space. Homotopy type and homotopy equivalent of spaces. — *Free groups and free products of groups*: Introduction. The weak product of abelian groups. Free abelian groups. Free products of groups. Free groups. The presentation of groups by generators and relations. Universal mapping problems. — *Seifert and Van Kampen theorem on the fundamental group of the union of two spaces. Applications*: Introduction. Statement and proof of the theorem of Seifert and Van Kampen. First application of theorem 2.1. Second application of theorem 2.1. Structure of the fundamental group of a compact surface. Application to knot theory. — *Covering spaces*: Introduction. Definition and some examples of covering spaces. Lifting of paths to a covering space. The fundamental group of a covering space. Lifting of arbitrary maps to a covering space. Homomorphisms and automorphisms of covering spaces. The action of the group $\pi(X, x)$ on the set $p^{-1}(x)$. Regular covering spaces and quotient spaces. Application: the Borsuk-Ulam theorem for the 2-sphere. The existence theorem for covering spaces. The induced covering space over a subspace. Point set topology of covering spaces. — *The fundamental group and covering spaces of a graph. Applications to group theory*: Introduction. Definition and examples. Basic properties of graphs. Trees. The fundamental group of a graph. The Euler characteristic of a finite graph. Covering spaces of a graph. Generators for a subgroup of free group. — *The fundamental group of higher dimensional spaces*: Introduction. Adjunction of 2-cells to a space. Adjunction of higher dimensional cells to a space. CW -complexes. The Kurosh subgroup theorem. Grushko's theorem. — *Epilogue*. — *Appendices*.

Eugene M. KLEINBERG. — **Infinitary combinatorics and the axiom of determinateness**. — Lecture notes in mathematics, vol. 612. — Un vol. broché, 17×24 , de VIII, 150 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

« ... these notes are distilled from a number of courses... taught at the Massachusetts Institute of Technology, Cambridge, Mass. between 1970 and 1976. They first appeared in draft form as material for a graduate course... »: Introduction. — Chapter I. — Chapter II. — Chapter III. — Chapter IV. — Chapter V. — Chapter VI. — Chapter VII. References.

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Introduction. — Preliminaries. — L^p -projections. — The Cunningham p -algebra. — The integral module representation. — The classical L^p -spaces. — Integral modules and

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Introduction and motivation. Situations of ε -equilibrium; ε -saddle points and ε -optimal strategies. ε -optimal strategies and minimaxes. Mixed strategies. Properties of the value of a game and of optimal strategies. The Helly metric. Conditionally compact games. The basic theorem for conditionally compact games. Continuous games on the unit square. Convex functions. Convex games; pure optimal strategies for player II. Convex games; optimal strategies for player I. Strictly convex games. Examples of convex games and their solutions. Market competition. Allocation of production capacities; minimization of the maximal intensity of a production scheme. Allocation of production capacities under partial uncertainty. — *Noncooperative games*: Mixed extensions of noncooperative games. Equilibrium situations. Nash's theorem. Properties of equilibrium situations. Bi-matrix games. Solutions of bi-matrix games. Almost antagonistic games. Prisoner's dilemma. The battle of the sexes. Noncooperative games with two pure strategies for each of the players. False advertising. Preservation of ecology. — *Cooperative games*: Characteristic functions. Characteristic functions of noncooperative games. Properties of characteristic functions for noncooperative games. Imputations and cooperative games. Essential and inessential games. Strategic equivalence of cooperative games. Zero games. The 0-1 reduced form. Classification of cooperative games with a small number of players. Dominance of imputations. The core of a game. The core of a general three-person game. von Neumann-Morgenstern solutions. νN - M solutions for three person constant sum games. νN - M solutions for general three-person cooperative games. Shapley's vector; axiomatization. Shapley's vector; existence and determination. Examples of Shapley vectors.

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Knots and knot types : Definition of a knot. Tame versus wild knots. Knot projections. Isotopy type, amphicheiral and invertible knots. — *The fundamental group* : Paths and loops. Classes of paths and loops. Change of basepoint. Induced homomorphisms of fundamental groups. Fundamental group of the circle. — *The free groups* : The free group $F[\mathcal{A}]$. Reduced words. Free groups. — *Presentation of groups* : Development of the presentation concept. Presentations and presentation types. The Tietze theorem. Word subgroups and the associated homomorphisms. Free abelian groups. — *Calculation of fundamental groups* : Retractions and deformations. Homotopy type. The van Kampen theorem. — *Presentation of a knot group* : The over and under presentations. The over and under presentations, continued. The Wirtinger presentation. Examples of presentations continued. The Wirtinger presentation. Examples of presentations. Existence of non-trivial knot types. — *The free calculus and the elementary ideals* : The group ring. The free calculus. The Alexander matrix. The elementary ideals. — *The knot polynomials* : The abelianized knot group. The group ring of an infinite cyclic group. The knot polynomials. Knot types and knot polynomials. — *Characteristic properties of knot polynomials* : Operation of the trivializer. Conjugation. Dual presentations. — *Appendix I* : Differentiable knots are tame. — *Appendix II* : Categories and groupoids. — *Appendix III* : Proof of the van Kampen theorem.

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Part I: C-algebras: Normed involutive algebras* : Involutive algebras. Normed involutive algebras. C*-algebras. Commutative C*-algebras. Functional calculus in C*-algebras. Positive elements in C*-algebras. Approximate identities in C*-algebras. Quotient of a C*-algebra. Addenda. — *Positive forms and representations* : Positive forms. Representations. Topologically irreducible representations. Positive forms and representations. Pure forms and irreducible representations. Existence of representations of C*-algebras. The enveloping C*-algebra of an involutive Banach algebra. A theorem on transitivity. Ideals in C*-algebras. Extension of representations of C*-algebras. Passage to an ideal and to a quotient algebra. Addenda. — *The spectrum of a C*-algebra* : The Jacobson topology. The spectrum of an ideal and of a quotient algebra. Norm and topology. Second definition of the topology on the spectrum. Third definition of the topology on the spectrum. Finite-dimensional representations. More about the spaces $Rep_n(A)$. The Mackey Borel structure. Addenda. — *Liminal C*-algebras* : The algebra of compact operators. Liminal C*-algebras. Postliminal C*-algebras. The spectrum of a postliminal C*-algebra. C*-algebras with continuous trace. Borel structure on the spectrum of a postliminal C*-algebra. Addenda. — *The type of a representation* : Comparison of representations and comparison of projections. Disjunction. Quasi-equivalence. Representations of type I. Involutive algebras of type I. Representations of types II and III. — *Traces and representations* : Traces. Bitraces. Maximal bitraces. Relations between traces and bitraces. The sum of two traces. Traces and representations. Characters and traceable factor representations. Finite traces. — *The quasi-spectrum* : The space of factor representations. Definition of the quasi-spectrum. Relations between the spectrum and the quasi-spectrum. The finite part of the quasi-spectrum. — *Integration and disintegration of representations* : Integration of representations. Equivalence of two direct integrals of representations. Disintegration of representations. Central disintegration. Disintegration into irreducible representations. The case of postliminal C*-algebras. An interlude. Disintegration of a positive form and of a trace. — *C*-algebras of type I* : Statement of the theorem, start of the proof. Preliminaries concerning systems of matrix

units. Some lemmas. The proof of the theorem, concluded. — *Continuous fields of C^* -algebras*: Continuous fields of Banach spaces. Total subsets. Continuous fields of C^* -algebras. The C^* -algebra defined by a continuous field of C^* -algebras. The continuous field of C^* -algebras defined by certain C^* -algebras. Some remarks concerning elementary C^* -algebras. The continuous field of elementary C^* -algebras defined by a continuous field of Hilbert spaces. Locally trivial fields of elementary C^* -algebras. Application to C^* -algebras with continuous trace. — *Extension to C^* -algebras of the Stone-Weierstrass theorem*: The case of postliminal C^* -algebras. Abundance of pure states in certain C^* -algebras. Statement of the theorem. Several lemmas. Proof of the theorem. — *The enveloping von Neumann algebra of a C^* -algebra*: The second dual of a C^* -algebra. Polar decomposition of a linear form. Decomposition of an hermitian form in positive and negative parts. The positive part of an ideal in a C^* -algebra. — *Part II: Applications to group representations: Unitary representations of locally compact groups*: Elementary definitions concerning representations. The involutive algebra $L^1(G)$. Representations of G and representations of $L^1(G)$. Positive forms on $L^1(G)$ and positive-definite functions. Weak* — convergence and compact convergence of continuous positive-definite functions. Pure positive-definite functions. Positive-definite measures. Square-integrable positive-definite functions. The C^* -algebra of a locally compact group. The Hilbert algebra of a unimodular locally compact group. — *Square-integrable irreducible representations*: Definition of square-integrable representations. Square-integrable representations and minimal biinvariant subspaces of $L^2(G)$. Coefficients of square-integrable representations. Formal dimension and trace. Integrable representations. — *Representations of compact groups*: Complete reducibility. Irreducible representations of a compact group. Characters of compact groups. Representations of finite groups. Use of compact subgroups of arbitrary groups. — *Almost-periodic functions*: The compact group associated with a topological group. Almost-periodic functions. The mean of an almost-periodic function. Groups injectable in a compact group. — *Characters of a locally compact group*: Definitions. The character defined by a measure, and by a distribution. Characters of finite type. — *The dual of a locally compact group*: Definition of the dual. The Fourier transformation. The reduced dual. The reduced dual and integrable representations. The Mackey Borel structure. The quasi-dual. Integration and disintegration of representations. The Plancherel measure. — *Appendices*.

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General introduction: Preliminary remarks. Elements of probability theory. Theoretical classification and specification of stochastic processes. — *Random sequences*: The random walk. Markov chains. Multiplicative chains. — *Processes in continuous time*: The additive process. Markov chains. Recurrence and passage times for renewal processes. Multiplicative chains. General equations for Markov processes. — *Miscellaneous statistical applications*: Some applications of the random walk or additive process. Simple renewal as a Markov process. Population growth as a multiplicative process. Epidemic models. — *Limiting stochastic operations*: Stochastic convergence. Stochastic linear difference and differential equations. Approximating and limiting solutions dependent on a parameter. — *Stationary processes*: Processes stationary to the second order. Generalized harmonic analysis. Processes with continuous spectra. Complete stationarity. Multivariate and multidimensional stationary processes. — *Prediction and communication theory*: Linear prediction for stationary processes. Theory of information and communication. — *The*

statistical analysis of stochastic processes : Principles of statistical inference. The analysis of probability chains. Estimation problems. — *Correlation analysis of time-series* : Correlation and regression analysis of stationary sequences. Harmonic (periodogram) analysis. Multivariate autoregressive series. Multidimensional series.

John LAMPERTI. — **Stochastic processes: a survey of the mathematical theory** .— Applied mathematical sciences, vol. 23. — Un vol. broché, 16×24 , de xvii, 266 p. — Prix: DM 21.40. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

Prerequisites. — Notation. — General introduction. — Second-order random functions — Stationary second-order processes. — Interpolation and prediction. — Strictly-stationary processes and ergodic theory. — Markov transition functions. — The application of semigroup theory. — Markov processes. — Strong Markov processes. — Martingale theory. — Appendices.

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Introduction. — Rappels de cours. — Exercices: *Arithmétique* : Divisibilité. Théorème de Fermat. Nombres premiers dans une progression arithmétique. Théorème de Wilson et applications. Groupes cycliques. Théorème chinois. Algorithme d'Euclide. P.G.C.D. Equation diophantienne. Numération-équation de Pell-Fermat. — *Algèbre-polynômes* : Algèbre-polynômes. Homomorphismes de l'anneau \mathbf{R} . Polynômes. Polynômes et arithmétique. P.G.C.D. et polynôme. Critère d'Eisenstein. Equation polynomiale. — *Trigonométrie* : Polynôme-trigonométrie. Trigonométrie. Trigonométrie et suites. — *Suites* : Relation de récurrence. Etude de suite. Représentation de réels par des suites de rationnels. — *Nombres réels-nombres rationnels* : Ecriture des nombres rationnels dans une base. Meilleure approximation. Nombres transcendants. Numération. Sous-groupes de $(\mathbf{R}, +)$. — *Analyse. Continuité, dérivation, intégration* : Continuité. Fonctions continues (valeurs intermédiaires). Fonction convexe. Théorème de Darboux. Etude de fonction. Dérivabilité. Espaces euclidiens. Intégration. Inégalité de Cauchy-Schwarz. Intégration. Equation fonctionnelle. Etude de deux équations différentielles. Primitive. — *Probabilités* : Probabilités. Loi faible des grands nombres. — *Géométrie. Algèbre linéaire* : Nombre complexes et géométrie. Géométrie (nombres complexes). Application des nombres complexes au triangle. Similitude plane. Alignement. Similitudes. Transformations à coefficients entiers. Transformation du plan affine euclidien. Applications linéaires continues. Groupes et géométrie. Similitudes. Plus courte distance. Projection sur des droites. Rotation dans l'espace. Transformation de \mathbf{R}^3 . Le groupe du cube. Le groupe $O_3^+(\mathbf{R})$ est un groupe simple. Polyèdres.

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Mengen und Abbildungen : Mengen. Mengensysteme. Abbildungen. — *Vektorräume* : Der Begriff des Vektorraumes, Beispiele. Regeln für das Rechnen in Vektorräumen. Linearkombinationen und Rechnen mit Teilmengen eines Vektorraumes. Unterräume eines Vektorraumes. Nebenräume und Quotientenräume. Konvexe Mengen. — *Basen eines Vektorraumes, Vektorräume von endlicher Dimension* : Basen eines Vektorraumes. Vektorräume von endlicher Dimension. Das Austauschverfahren. Konvexe Polyeder. — *Determinanten* : Permutationen. Determinanten. Numerische Berechnung von Determinanten. — *Lineare Abbildungen von Vektorräumen, Matrizen* : Lineare Abbildungen. Lineare Abbildungen von Vektorräume endlicher Dimension, Matrizen. Lineare Abbildungen eines Vektorraumes in sich (Endomorphismen). Basiswechsel. Numerische Inversion von Matrizen. Austauschverfahren und Matrizenrechnung. — *Lineare Formen* : Lineare Formen und Nebenräume. Dualität von Vektorräumen endlicher Dimension. Lineare Formen, die auf einer konvexen Mengen positiv sind. — *Systeme von linearen Gleichungen und Ungleichungen* : Die Lösungen eines Systems von linearen Gleichungen. Numerische Auflösung von Systemen linearer Gleichungen. Positive Lösungen eines reellen linearen Gleichungssystems. Systeme von linearen Ungleichungen. — *Lineare Programmierung* : Lineare Programme. Das Dualitätsgesetz der linearen Programmierung. Das Simplex-Verfahren für die numerische Auflösung von linearen Programmen. Die Behandlung freier Variablen. Allgemeine lineare Programme. Simplex-Verfahren und Dualität. — *Ausgleichung nach Tschebyscheff* : Das Tschebyscheffsche Ausgleichungsprinzip. Beweis zweier schon früher verwendeter Resultate. — *Spieltheorie* : Zwei-Personen-Nullsummenspiele, reine Strategien. Gemischte Strategien. Berechnung von Spielen mit dem Simplex-Verfahren. — *Formen zweiten Grades* : Quadratische Formen auf reellen Vektorräumen. Hermitesche Formen auf komplexen Vektorräumen. — *Euklidische und unitäre Vektorräume* : Euklidische Vektorräume. Approximation in euklidischen Vektorräumen, Methode der kleinsten Quadrate. Hilbertsche Räume. Unitäre Vektorräume. — *Eigenwerte und Eigenvektoren von Endomorphismen eines Vektorraumes* : Eigenvektoren und Eigenwerte. Symmetrische Endomorphismen eines euklidischen

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category of analytic spaces and the category of algebraic spaces. — Applications of the quotient theorems to moduli of algebraic varieties. — Quotients for affine schemes by reductive algebraic groups. — Quotients in the category of schemes. — Mumford's construction of the moduli variety for curves and polarized abelian varieties. Other applications of Mumford's quotient theory. — Other methods of treating moduli problems. Artin's method of algebraic stacks. Griffith's method of period maps. — Compactification of moduli spaces. — Fine moduli spaces. The universal families for stable curves with level n -structures. — Applications of moduli theory to fibre spaces and the additivity formula for the Kodaira dimension of fibre spaces. Open problems. — Appendix: Classical invariant theory.

Robert M. KAUFMANN, Thomas T. READ, Anton ZETTL. — **The deficiency index problem for powers of ordinary differential expressions.** — Lecture notes in mathematics, vol. 621. — Un vol. broché, 17 × 24, de vi, 112 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

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Neal KOBLITZ. — **p -adic numbers, p -adic analysis, and zeta-functions.** — Graduate texts in mathematics, vol. 58. — Un vol. relié, 17 × 24, de X, 122 p. — Prix: DM 27.90. — Springer Verlag, New York/Heidelberg/Berlin, 1977.

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Part A: Model theory: Guide to part A. *J. Barwise*: An introduction to first-order logic. *H. J. Keisler*: Fundamentals of model theory. *P. C. Eklof*: Ultraproducts for algebraists. *A. Macintyre*: Model completeness. *M. Morely*: Homogeneous sets. *K. D. Stroyan*: Infinitesimal analysis of curves and surfaces. *M. Makkai*: Admissible sets and infinitary logic. *A. Kock & G. E. Reyes*: Doctrines in categorical logic. — *Part B: Set theory*: Guide to part B. *J. R. Shoenfield*: Axioms of set theory. *T. J. Jech*: About the axiom of choice. *K. Kunen*: Combinatorics. *J. P. Burgess*: Forcing. *K. J. Devlin*: Constructibility. *M. E. Rudin*: Martin's axiom. *I. Juhasz*: Consistency results in topology. — *Part C: Recursion theory*: Guide to part C. *H. B. Enderton*: Elements of recursion theory. *M. Davis*: Unsolvability problems. *M. O. Rabin*: Decidable theories. *S. G. Simpson*: Degrees of unsolvability: a survey of results. *R. A. Shore*: α -recursion theory. *A. Kechris and Y. N. Moschovakis*: Recursion in higher types. *P. Aczel*: An introduction to inductive definitions. *D. A. Martin*: Descriptive set theory: projective sets. — *Part D: Proof*

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S. FIORINI and R. J. WILSON. — **Edge-colourings of graphs.** — Research notes in mathematics, vol. 16. — Un vol. broché, 17 × 25, de 154 p. — Prix: £6.50. — Pitman, London/San Francisco/Melbourne, 1977.

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Walter RUDIN. — **Analyse réelle et complexe.** — Traduit de l'américain par N. Dhombres et F. Hoffman. — Deuxième tirage. — Un vol. broché, 17 × 24, de x, 397 p. — Prix: FF 130.00. — Masson, Paris/New York/Barcelone/Milan, 1978.

La fonction exponentielle. — Théorie abstraite de l'intégration: Notations de la théorie des ensembles et terminologie. La notion de mesurabilité. Fonctions étagées. Propriétés élémentaires des mesures. Arithmétique dans $[0, \infty]$. Intégration des fonctions positives. Intégration des fonctions complexes. Rôle des ensembles de mesure nulle. — *Mesures de Borel positives*: Espaces vectoriels. Préliminaires topologiques. Théorème de représentation de Riesz. Propriétés de régularité des mesures de Borel. Mesure de Lebesgue. Propriétés de continuité des fonctions mesurables. — *Espaces L^p* : Fonctions convexes et inégalités. Espaces L^p . Approximation par des fonctions continues. — *Théorie élémentaire des espaces de Hilbert*: Produits scalaires et formes linéaires. Ensembles ortho-normés. Séries trigonométriques. — *Exemples d'utilisation des espaces de Banach*: Espaces de Banach. Conséquences du théorème de Baire. Séries de Fourier de fonctions continues. Coefficients de Fourier des fonctions de L^1 . Théorème de Hahn-Banach. Une approche abstraite de l'intégrale de Poisson. — *Mesures complexes*: Variation totale. Absolue continuité. Conséquences du théorème de Radon-Nikodym. Formes linéaires bornées sur L^p . Théorème de représentation de Riesz. — *Intégration sur les espaces produits*: Mesurabilité sur les produits cartésiens. Mesures produits. Théorème de Fubini. Complétion d'une mesure produit. Convolutions. — *Différentiation*: Dérivée d'une mesure. Fonctions à variation bornée. Différentiation de fonctions ponctuelles. Transformations différentiables. — *Transformation de Fourier*: Propriétés formelles. Théorème d'inversion. Théorème de Plancherel. L'algèbre de Banach L^1 . — *Propriétés élémentaires des fonctions holomorphes*: Différentiation complexe. Intégration sur des chemins. Le théorème de Cauchy. Représentation en série entière. Le théorème de l'image ouverte. — *Fonctions harmoniques*: Les équations de Cauchy-Riemann. L'intégrale de Poisson. La propriété de valeur moyenne. Les fonctions harmoniques positives. — *Le principe du maximum*: Lemme de Schwarz. Méthode de Phragmen-Lindelöf. Un théorème d'interpolation. Une réciproque du théorème du maximum. — *Approximation par des fonctions ration-*

nelles : Théorème de Runge. Théorème de Cauchy. Domaines simplement connexes. — *Représentation conforme* : Conservation des angles. Transformations homographiques. Familles normales. Théorème de l'application conforme de Riemann. Classe δ . Continuité à la frontière. Image conforme d'une couronne. — *Zéros des fonctions holomorphes* : Produits infinis. Théorème de factorisation de Weierstrass. Théorème de Mittag-Leffler. Formule de Jensen. Produits de Blaschke. Théorème de Müntz-Szasz. — *Prolongement analytique* : Points réguliers et points singuliers. Prolongement le long d'une courbe. Théorème de monodromie. Construction d'une fonction modulaire. Théorème de Picard. — *Espaces H^p* : Fonctions sous-harmoniques. Espaces H^p et N . Espace H^2 . Théorème de F. et M. Riesz. Théorèmes de factorisation. Opérateur de déplacement. Fonctions conjuguées. — *Théorie élémentaire des algèbres de Banach* : Éléments inversibles. Idéaux et homomorphismes. Applications. — *Transformées de Fourier holomorphes* : Deux théorèmes de Paley et Wiener. Classes quasi-analytiques. Théorème de Denjoy-Carleman. — *Approximation uniforme par des polynômes* : Quelques lemmes. Théorème de Mergelyan. — *Appendice* : Théorème de maximalité de Hausdorff.

David GILBARG, Neil S. TRUDINGER. — **Elliptic partial differential equations of second order.** — Grundlehren der mathematischen Wissenschaften, Band 224. — Un vol. relié, 18×25 , de x, 401 p. — Prix: DM 78.00. — Springer Verlag, Berlin/Heidelberg/New York, 1977.

Linear equations : Laplace's equation. The classical maximum principle. Poisson's equation and the Newtonian potential. Banach and Hilbert spaces. Classical solutions; the Schauder approach. Sobolev spaces. Generalized solutions and regularity. — *Quasi linear equations* : Maximum and comparison principles. Topological fixed point theorems and their application. Equations in two variables. Hölder estimates for the gradient. Boundary gradient estimates. Global and interior gradient bounds. Equations of mean curvature type. — *Appendix* : Boundary curvatures and the distance function. — Bibliography. — Subject index. — Notation index.

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1^{re} partie : 110 problèmes dont: La nouvelle étoile. La promenade à bicyclette. En arrière et en avant. Le jeu de dés des forains. Le talisman. Deux dindes. En Grèce antique. Les poulets dans le champ. De Bixley à Quixley. La chaise à porteurs. Quel est le bénéfice. La meule. La braderie. Le serpent roulant. L'étoile cachée. Le problème du plombier. L'infirmière de la Croix-Rouge. Le 14 et le 15. Le neveu malade. L'homme à la bêche. Le lingot d'or. Le problème du nénuphar. Le vieux phare. Commerce de volailles. Les ponts de Königsberg... etc. — *2^e partie* : 162 problèmes dont: Le problème du singe. Le hamac. Le prix des œufs. Le problème de Beppo. Le laitier conscientieux. Le problème de Rip van Winkle. La porcherie. Le cochon dans le jardin. Les cinq vendeurs de journaux. Quel est l'âge de Marie? Weary Willie. Le problème de la Lune. La balle de l'assassin. Le problème des bacs. Placer neuf allumettes pour faire huit et huit autres pour annuler le jeu. Jack Sprat. Le problème de l'avare. La lune et le croissant. Problème d'écolier. Projet de dépenses. La question du temps. Jack et Jill. Le problème du laitier. Le problème de l'aiguillage. Le maillon manquant... etc.

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Topologie algébrique et différentielle: Les techniques. Les résultats. Rapports avec les sciences de la nature. Les initiateurs. — *Variétés différentielles; géométrie différentielle*: La théorie générale. Les G -structures. La topologie des variétés différentielles. Variétés différentielles de dimension infinie. Rapports avec les sciences de la nature. Les initiateurs. — *Equations différentielles*: La théorie algébrique. Les équations différentielles dans le domaine complexe. L'étude qualitative des équations différentielles. Le problème de classification. Problèmes aux limites. Rapports avec les sciences de la nature. Les initiateurs. — *Théorie ergodique*: Le théorème ergodique. Les problèmes de classification. Rapports avec les sciences de la nature. Les initiateurs. — *Equations aux dérivées partielles*: L'étude locale des systèmes différentiels. Système complètement intégrables et feuilletages. Equations aux dérivées partielles linéaires; théorie générale. Equations à coefficients constants. Problèmes aux limites pour les équations linéaires I, II, et III. Opérateurs pseudo-différentiels sur les variétés compactes. Equations aux dérivées partielles non linéaires. Rapports avec les sciences de la nature. Les initiateurs. — *Analyse harmonique non commutative*: Les cas élémentaires: groupes compacts et groupes commutatifs. Les problèmes fondamentaux. L'analyse harmonique sur les groupes de Lie réductifs réels. L'analyse harmonique sur les groupes réductifs p -adiques. L'analyse harmonique sur les groupes de Lie nilpotents ou résolubles. Représentations linéaires des extensions de groupes. Rapports avec les sciences de la nature. Les initiateurs. — *Formes automorphes et formes modulaires*: L'aspect analytique. L'intervention des groupes de Lie. L'intervention des groupes adéliques. Applications à la théorie des nombres. Formes automorphes, variétés abéliennes et corps de classes. Relations avec la théorie arithmétique des formes quadratiques. Rapports avec les sciences de la nature. Les initiateurs. — *Géométrie analytique*: Fonctions de plusieurs variables complexes et espaces analytiques. Espaces analytiques compacts; variétés kähleriennes. Variations de structures complexes et variétés de dimen-

sion infinie. Espaces analytiques réels et p -adiques. Rapports avec les sciences de la nature. Les initiateurs. — *Géométrie algébrique* : Le cadre moderne de la géométrie algébrique. Les notions fondamentales de la théorie des schémas. L'étude des singularités. La théorie « transcendantale » des variétés algébriques. La cohomologie des schémas. Problèmes de classification. Groupes algébriques. Schémas formels et groupes formels. Rapports avec les sciences de la nature. Les initiateurs. — *Théorie des nombres* : Le point de vue moderne en Théorie des nombres. La théorie du corps de classes. Approximation diophantienne et nombres transcendants. Géométrie diophantienne. Groupes linéaires arithmétiques. Rapports avec les sciences de la nature. Les initiateurs. — *Algèbre homologique* : Foncteurs dérivés dans les catégories abéliennes. Cohomologie des groupes. Cohomologie des algèbres associatives. Cohomologie des algèbres de Lie. Structures simpliciales. La K -théorie. Rapports avec les sciences de la nature. Les initiateurs. — *Groupes de Lie* : Les théorèmes de structure. Groupes de Lie et groupes de transformation. Topologie des groupes de Lie et des espaces homogènes. Rapports avec les sciences de la nature. Les initiateurs. — *Groupes abstraits* : Générateurs et relations. Groupes de Chevalley et systèmes de Tits. Représentations linéaires et caractères. La recherche des groupes simples finis. Rapports avec les sciences de la nature. Les initiateurs. — *Analyse harmonique commutative* : Les problèmes de convergence. Algèbres nommées de l'Analyse harmonique. Ensembles parfaits symétriques en Analyse harmonique: relations avec l'arithmétique. Fonctions presque périodiques et fonctions moyenne-périodiques. Applications de l'Analyse harmonique commutative. Rapports avec les sciences de la nature. Les initiateurs. — *Algèbres de von Neumann* : La théorie de Tomita et les invariants de Connes. Applications aux algèbres stellaires. Rapports avec les sciences de la nature. Les initiateurs. — *Logique mathématique* : Non contradiction et indécidabilité. Procédés effectifs uniformes et relations récursives. La technique des ultraproducts. Rapports avec les sciences de la nature. Les initiateurs. — *Calcul des probabilités* : Fluctuations dans les suites de variables aléatoires indépendantes. Inégalités sur les martingales. Trajectoires des processus. Processus généralisés. Variables aléatoires à valeurs dans les groupes localement compacts. Rapports avec les sciences de la nature. Les initiateurs. — *Catégories et faisceaux* : Catégories et foncteurs. Foncteurs représentables. Catégories abéliennes. Faisceaux et espaces annelés. Sites et topos. Rapports avec les sciences de la nature. Les initiateurs. — *Algèbre commutative* : Les principales notions. Problèmes de la théorie des corps. Rapports avec les sciences de la nature. Les initiateurs. — *Théorie spectrale des opérateurs* : La théorie de Riesz-Fredholm. Algèbres de Banach. La théorie spectrale de Hilbert-von Neumann. Rapports avec les sciences de la nature. Les initiateurs.

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What is science ? : Introduction. Relevance. Consistency. Publicity. The fringe of science. Science and technology. Science and faith. Values. — *On education* : What does "Education" mean ? Science and the picture of man. A case in point. Environment and

heredity. Equal chances for all. Education bottled and funneled. The social context. The heterogeneous learning group. The strategy of innovation. Teacher training. Educational philosophy. — *A science of education*: Does it exist? In full bloom. Atomisation. The attainment of concepts. Objectives of instruction. Opinion polls. Diagnosis. Production of the package. The art of dividing. Models. Mathematical models. Educationese. Rituals. Educational accountancy. Educational Research Inc. A socio-psychological view. The end of the matter. — *A science of mathematical education*: The art of mathematics teaching. Team work as a source of research. The theoretician in the team. The learning situation as a source of research. Language as a vehicle of research. Motivation. Generality by comprehension and by apprehension. Apprehension and paradigm. In vain quest for the paradigm. In vain quest for discontinuities in the learning process. An apprehending approach to algebra. The mathematical background of the geometrical approach to algebra. The algebraic versus the arithmetical approach to algebra. Level of language. Change of perspective. The field of tension between global and local perspectives. The field of tension between quantitative and qualitative perspectives. Grasping the context — chances. I see it so. An example of didactical phenomenology — ratio and proportion.

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The cluster wave operators. Scattering into cones. Cross sections. — *The three-body problem: The three-particle resolvent. Three-particle cross sections.* (Notes and supplementary material — Problèmes après chaque chapitre).

Klaus HEIDLER und Friedrich-K. MAHN. — **Rekursive Funktionen.** — Un vol. broché, 14 × 21, de VII, 236 p. — Prix: DM 28 00. — Bibliographisches Institut, Mannheim/Wien/Zürich, 1977.

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Eléments d'algèbre. Algèbre linéaire: Ensembles. Relations. Notions sur l'algèbre de Boole. Structures algébriques. Espaces vectoriels. Opérateurs linéaires. Matrices. Valeurs propres. Espaces vectoriels normés. Matrices hermitiennes. Algèbre tensorielle. Applications du calcul tensoriel à la mécanique. — *Fonctions. Intégrales simples:* Convergence. Continuité. Fonctions d'une ou plusieurs variable réelles. Séries numériques. Calcul des intégrales simples. Généralisations de la notion d'intégrale. — *Fonctions définies par des séries ou des intégrales:* Séries de fonctions. Fonctions définies par des intégrales. Espace de Hilbert. Fonctions de carré intégrable. Séries de Fourier. Intégrales de Fourier. Applications des séries et intégrales de Fourier.

J. BASS. — **Cours de mathématiques. Tome 1, fascicule 2.** — Calcul différentiel, intégrales multiples, fonctions de variance complexe. — 5^e édition revue et augmentée. — Un vol. relié, 17 × 25, de X, 371 p. — Prix: FF 88.00. — Masson, Paris/New York/Barcelone/Milan, 1978.

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trie infinitésimale. Intégrales multiples. Intégrales curvilignes. Intégration des différentielles exactes. Intégrales de surfaces. Formules intégrales d'analyse vectorielle. Intégrales multiples généralisées. Série doubles. Fonctions eulériennes. — *Fonctions de variables complexe* : Dérivée d'une fonction de variable complexe. Fonctions élémentaires. Intégration des fonctions analytiques. Séries de fonctions analytiques. Théorème des résidus. Applications.

J. BASS. — **Cours de mathématiques. Tome 2.** — Equations différentielles et aux dérivées partielles, optimisation. Groupes de transformations. Méthodes numériques. — 5^e édition, revue et augmentée. Un vol. relié, 17 × 25, de XII, 466 p. — Prix: FF 110.00. — Masson, Paris/New York/Barcelone/Milan, 1978.

Equations et systèmes différentiels : Propriétés générales. Systèmes différentiels linéaires. Transformation de Laplace. Equations différentielles linéaires du second ordre. Fonctions de Bessel. — *Calcul des variations. Optimisation* : Fonctions de plusieurs variables. Calcul des variations. Problèmes de contrôle. — *Equations aux dérivées partielles du premier ordre* : Equations aux dérivées partielles linéaires du premier ordre. Notions sommaires sur les équations aux dérivées partielles non linéaires du premier ordre. — *Groupes de transformations* : Généralités sur les groupes. Notions sur les groupes de Lie. Applications aux représentations du groupe des rotations de \mathbf{R}^3 . — *Equations aux dérivées partielles du second ordre* : Généralités. Caractéristiques. Etude de quelques équations aux dérivées partielles linéaires du second ordre. Equation de Laplace. Notions sur les fonctions harmoniques et les potentiels newtoniens. — *Méthodes numériques* : Equations, matrices. Intégrales définies. Séries. Equations différentielles et aux dérivées partielles. Notions sur les abaques.

Encyclopedic dictionary of mathematics. — By the Mathematical Society of Japan, ed. by Shōkichi Iyanaga and Yukiyosi Kawada, translation reviewed by Kenneth O. May (translation by the Mathematical Society of Japan with the cooperation of the American mathematical society). — 2 volumes reliés, 18 × 29, de XIV, 1750 p. — Prix: \$137.50. — The M.I.T. Press, Cambridge, Mass./London, 1977.

This monumental work is an encyclopedic dictionary with articles of medium length aimed at presenting the whole of mathematics. It gives exact definitions of important terms in both pure and applied mathematics. It describes the present state of research in each field, together with some historical background and some perspectives for the future. It includes articles on mathematical programming and theoretical physics. It will be consulted often by mathematicians and students with great profit.

The bulk of the work consists of more than 400 articles classed by alphabetical order, with numerous references to the most important works published before 1976.

At the end of the second volume are over 100 pages of very useful tables and formulas. There is also a name index with over 3.000 entries and a subject index with about 27,000 entries.

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