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Contient 20 exposés par: A. Chenciner, C. A. Curley, F. Ronga, M. R. Herman, M. R. Herman, A. Banyaga, J. P. Pommaret, S. Halperin, D. Lehman, A. Haefliger, P. Molino, C. Roger, S. Guelorget, L. A. Cordero, J. L. Cathelineau, A. Sec, R. Lutz, F. Valera, I. Kupka, Ngô Van Que, C. Lamoureux, P. A. Schweitzer, K. C. Millett.

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Functions with positive real part. — Special classes: convex, starlike, real, typically real, close-to-convex, bounded boundary rotation. — The Pólya-Schoenberg conjecture. — Representation of continuous linear functionals. — Faber polynomials. — Extremal length and equicontinuity. — Compact families  $F(D, l_1, l_2, P, Q)$  of univalent functions normalized by two linear functionals. — Properties of extreme points for some compact families  $F(D, l_1, l_2, P, Q)$ . — Elementary variational methods. — Application of Schiffer's boundary variation to linear problems. — Application to some nonlinear problems. — Some properties of quasiconformal mappings. — A variational method for q.c. mappings. — Application to families of conformal and q.c. mappings. — Sufficient conditions for q.c. extensions. — Some convexity theory. — Coefficient and distortion theorems. — Schiffer's boundary variation and fundamental lemma.

Robert D. M. ACCOLA. — **Riemann surfaces, theta functions, and abelian automorphisms groups.** — Lecture notes in mathematics, vol. 483. — Un vol. broché,  $16,5 \times 24$ , de iii, 105 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1975.

*Part I:* Introduction. Remarks on general coverings. Résumé of the Riemann vanishing theorem. Ramified normal coverings. Abelian covers. Main results. — *Part II:* Introduction. Completely ramified abelian covers. Two-sheeted covers. Other applications. Closing remarks. — *Part III:* Introduction. Castelnuovo's method and  $p_0$ -hyperellipticity. Extensions. The  $p - 2$  conjecture for  $p = 5$ . Elliptic-hyperelliptic surfaces of genus five. Elliptic-hyperelliptic surfaces of genus three. Cyclic groups of order three for genus two. Some local characterizations. Closing remarks.

Hans Martin REIMANN; Thomas RYCHENER. — **Funktionen beschränkter mittlerer Oszillation.** — Lecture notes in mathematics, vol. 487. — Un vol. broché, 16,5 × 24, de vi, 141 p. — Prix: DM 18.00. — Springer Verlag, Berlin/Heidelberg/New York, 1975.

*Funktionen beschränkter mittlerer Oszillation* : Definition. Elementare Hilfssätze. Möbiustransformationen. BMO-Funktionen auf der Sphäre, auf der Kugel und auf Riemann'schen Flächen. Anhang I. — *Die Sätze von John-Nirenberg und Gehring* : Das Zerlegungslemma von Calderón-Zygmund. Der Satz von John-Nirenberg. Der Satz von Gehring. Anhang II. — *Muckenhoupts  $A_p$ -Bedingung* : Charakterisierung der  $A_p$ -Funktionen. Äquivalente Bedingungen. BMO-Funktionen bezüglich allgemeiner Masse. Anhang III. — *Der Dualitätssatz* : Singuläre Integrale beschränkter Funktion. Poisson-Integrale von BMO-Funktionen. Der Dualitätssatz. Anhang IV. — *Quasikonforme Abbildungen* : Zur Definition quasikonformer Abbildungen. Die Jacobi-Determinante quasikonformer Abbildungen. Die Invarianz des Raumes BMO. Interpolation. Anhang V. *Riesz-Potentiale von BMO-Funktionen* : Einführung. Riesz-Potentiale und Hardy-Klassen  $H^p$ . Riesz-Potentiale von BMO-Funktionen. Orlicz-Räume und BMO. Anhang VI. — Literaturverzeichnis.

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23 exposés par: M. Auslander. M. Auslander and I. Reiten. M. Auslander, E. L. Green and I. Reiten. S. Brenner. M. C. R. Butler. S. B. Conlon. A. Dress. P. Gabriel. L. Gruson. W. Hamernik. H. Jacobinski. G. J. Janusz. H. Kupisch. M. Loupias. G. O. Michler. W. Müller. L. A. Nazarova. I. Reiner. C. M. Ringel. K. M. Roggenkamp. A. V. Roiter and M. M. Kleiner. W. Scharlau. H. Tachikawa.

N. AHMED; K. R. RAO. — **Orthogonal transforms for digital signal processing.** — Un vol. relié, 16 × 23,5, de xii, 263 p. — Prix: DM 56.00. — Springer Verlag, Berlin/Heidelberg/New York, 1975.

*Introduction* : General remarks. Terminology. Signal representation using orthogonal functions. Book outline. References. Problems. — *Fourier representation of signals* : Fourier representation. Power, amplitude and phase spectra. Fourier transform. Relation between the Fourier series and the Fourier transform. Crosscorrelation, autocorrelation, and convolution. Sampling theorem. Summary. References. Problems. — *Fourier representation of sequences* : Definition of the discrete Fourier transform. Properties of the DFT. Matrix representation of correlation and convolution. Relation between the DFT and the Fourier transform series. Power, amplitude, and phase spectra. 2-dimensional DFT. Time-varying Fourier spectra. Summary. Appendix 3.1. References. Problems. — *Fast Fourier transform* : Statement of the problem. Motivation to search for an algorithm. Key to developing the algorithm. Development of the algorithm. Illustrative examples. Shuffling. Operations count and storage requirements. Some applications. Summary. Appendix 4.1: an FFT computer program. References. Problems. — *A class of orthogonal functions* : Definition of sequency. Notation. Rademacher and Haar functions. Walsh functions. Summary. Appendix 5.1: elements of the Gray code. References. Problems. — *Walsh-Hadamard transform* : Walsh series representation. Hadamard ordered Walsh-Hadamard transform  $(\text{WHT})_h$ . Fast Hadamard ordered Walsh-Hadamard transform  $(\text{FWHT})_h$ . Walsh ordered Walsh-Hadamard transform  $(\text{WHT})_w$ . Fast Walsh ordered Walsh-Hadamard transform  $(\text{FWHT})_w$ . Cyclic and dyadic shifts.  $(\text{WHT})_w$  spectra.

(WHT)<sub>h</sub> spectra. Physical interpretations for the (WHT)<sub>h</sub> power spectrum. Modified Walsh-Hadamard transform (MWHT). Cyclic and dyadic correlation/convolution. Multidimensional (WHT)<sub>h</sub> and (WHT)<sub>w</sub>. Summary. Appendix 6.1: WHT computer program. References. Problems. — *Miscellaneous orthogonal transforms*: Matrix factorization. Generalized transform. Haar transform. Algorithms to compute the HT. Slant transform (ST). Discrete cosine transform (DCT). 2-dimensional transform considerations. Summary. Appendix 7.1: Kronecker products. Appendix 7.2: matrix factorization. References. Problems. — *Generalized Wiener filtering*: Some basic matrix operations. Mathematical model. Filter design. Suboptimal diagonal filters. 2-dimensional Wiener filtering considerations. Summary. Appendix 8.1: some terminology and definitions. References. Problems. — *Data compression*: Search for the optimum transform. Variance criterion and the variance distribution. Electrocardiographic data compression. Image data compression considerations. Image data compression examples. Additional considerations. Summary. Appendix 9.1: Lagrange multipliers. References. Problems. — *Feature selection in pattern recognition*: Introduction. The concept of training.  $d$ -dimensional patterns. The 3-class problem. Image classification experiment. Least-squares mapping technique. Augmented feature space. 3-class least-squares minimum distance classifier.  $K$ -class least-squares minimum distance classifier. Quadratic classifiers. An ECG classification experiment. Summary. References. Problems.

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**Studies in topology.** — Edited by Nick M. Stavrakas; Keith R. Allen. — Un vol. relié, 16 × 23,5, de xxii, 650 p. — Prix: \$27.50. — Academic Press, New York/San Francisco/London, 1975.

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D. A. Edwards, O. Feichtinger and W. R. Geiger, R. W. Fitzgerald, W. G. Fleissner, R. F. Gittings, J. A. Guthrie and M. Henry, Ch. L. Hagopian, R. W. Heath, D. J. Lutzer, and P. L. Zenor, S. H. Hechler, L. S. Husch, K. R. Kellum, S.-Kyu Kim, D. McGavran and J. Pak, G. Kozlowski, K. Kuperberg, W. Kuperberg, A. Lelek, L. Lum, K. Magill, S. Mardesic, D. R. McMillan Jr., S. B. Nadler Jr., M. H. Miller Jr., S. Newman, P. J. Nyikos, B. J. Pettis, T. M. Phillips, S. Purisch, G. M. Reed, G. M. Reed and P. L. Zenor, D. F. Reynolds, J. W. Rogers Jr., M. E. Rudin, B. M. Scott, J. Segal, S. Singh, J. C. Smith, M. Starbird, S. Subbiah, K. Sundaresan, H. H. Wicke, J. M. Worrell Jr., L. E. Ward Jr.

Robert A. ADAMS. — **Sobolev spaces.** — Pure and applied mathematics, vol. 65. — Un vol. relié, 15,5 × 24, de VIII, 268 p. — Prix: \$24.50. — Academic Press, New York/San Francisco/London, 1975.

Introductory topics. — The spaces  $L^p(\Omega)$ . — The spaces  $W^{m,p}(\Omega)$ . — Interpolation and extension theorems. — Imbeddings of  $W^{m,p}(\Omega)$ . — Compact imbeddings of  $W^{m,p}(\Omega)$ . — Fractional order spaces. — Orlicz and Orlicz-Sobolev spaces.

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PART ONE: Introduction: Limitations. The major historical periods, an outline. General bibliography. — *Book I*: The Almagest and its direct predecessors: A. Spherical astronomy. Plane trigonometry. Spherical trigonometry. Equatorial and ecliptic coordinates. Geographical latitude; length of daylight. Ecliptic and horizon coordinates. B. Lunar theory. Solar theory. Equation of time. Theory of the moon. First inequality latitude. Theory of the moon. Second inequality. Parallax. Theory of eclipses. C. Planetary theory. Introduction. Venus. Mercury. The Ptolemaic theory of the motion of an outer planet. Planetary tables. Theory of retrogradation. Planetary latitudes. Heliacal phenomena ("phases"). D. Apollonius. Biographical data. Equivalence of eccenters and epicycles. Planetary motion; stationary points. E. Hipparchus. Introduction. Fixed stars. The length of the year. Trigonometry and spherical astronomy. Solar theory. The theory of the moon. Additional topics. Hipparchus' astronomy. Summary. — *Book II*: Babylonian astronomy. Introduction: The decipherment of the astronomical texts. The sources. Calendaric concepts. Length of daylight. Solar motion. Mathematical methodology. A. Planetary theory. Basic concepts. Periods and mean motions. System A. Dates. Subdivision of the synodic arc; daily motion. The fundamental patterns of planetary theory. The single planets. B. Lunar theory. Introduction. Lunar velocity. The length of the synodic months. The "Saros" and column  $\Phi$ . Lunar latitude. Eclipse magnitudes. Eclipse tables. Solar mean motion and length of year. Variable solar velocity. Visibility. Early Babylonian astronomy.

PART TWO: *Book III*: Egypt. Introduction and summary. The 25-year lunar cycle. Concluding remarks. Bibliography. — *Book IV*: Early Greek astronomy. Introduction: A. The beginning of Greek astronomy. Chronological summary. Sphericity of the earth; celestial sphere and constellations. Geminus. Babylonian influences. B. Early lunar and solar theory. Luni-solar cycles; lunar theory. Solar theory. Sizes and distances of the luminaries. Eclipses. The "steps" ( $\beta\alpha\theta\mu\omicron\iota$ ). C. Early planetary theory. Eudoxus. Other planetary hypotheses. The inscription of Keskinto. The development of spherical astron-

omy. Arithmetical methods; length of daylight; climata. Shadow tables. Spherical astronomy before Menelaus. Plane trigonometry. *Book V*: Astronomy during the Roman imperial period and late antiquity. Introduction. A. Planetary and lunar theory before Ptolemy. Planetary theory. Lunar theory. Visibility problems. B. Ptolemy's minor works and related topics. Biographical and bibliographical data. The "Analemma" and its prehistory. The "Planisphaerium". Map projection. Optics. The tetrabiblos. "Planetary hypotheses" and "Canobic inscription". Additional writings of Ptolemy. C. The time from Ptolemy to the seventh century. Introduction. The time from Ptolemy to Theon. Pappus and Theon. The Handy Tables. The time from Theon to Heraclius.

PART THREE: *Book VI*: Appendices and indices. Figures and plates. A. Chronological concepts. Years and julian Days. Special calendars and eras. The reckoning of days. The foundations of historical chronology. Literature. B. Astronomical concepts. Spherical coordinates. Years, months. Fixed stars. Geocentric planetary motion. Planetary and fixed star phases. Lunar and solar eclipses. Kepler motion. The inequalities of the lunar motion. C. Mathematical concepts. Sexagesimal computations. Square root approximations. Trigonometry. Diophantine equations; continued fractions. Tables. D. Indices. Subject index. Bibliographical abbreviations. Notations and symbols. Greek glossary. E. Figures and plates.

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VOL. I: Über die Struktur des endlichen, vollständig primären Ringes mit verschwindendem Radikalquadrat. — Über den allgemeinen Zellenbegriff und die Zellenerspaltungen der Komplexe. — Eine Bemerkung zur Dimensionstheorie. — On some fundamental theorems in the theory of operators in Hilbert space. — On the theory of almost periodic functions in a group. (Collab. with S. Iyanaga). — Über die Differenzierbarkeit der einparametrischen Untergruppe Liescher Gruppen. — Über zusammenhängende kompakte abelsche Gruppen (collab. with M. Abe). — Die Kuratowskische Abbildung und der Hopfsche Erweiterungssatz. — Über die Gruppe der messbaren Abbildungen. — Über die Beziehung zwischen den Massen und den Topologien in einer Gruppe. — Normed ring of a locally compact abelian group. (Collab. with S. Kakutani). — Über die Harmonischen Tensorfelder in Riemannschen Mannigfaltigkeiten, (I), (II), (III). — Über die Rand- und Eigenwertprobleme der linearen elliptischen Differentialgleichungen zweiter Ordnung. — Über das Haarsche Mass in der lokal bikompakten Gruppe (collab. with S. Kakutani). — Relations between harmonic fields in Riemannian manifolds. — On the existence of analytic functions on closed analytic surfaces. — Harmonic fields in Riemannian manifolds (generalized potential theory). — The eigenvalue problem for ordinary differential equations of the second order and Heisenberg's theory of S-matrices. — On ordinary differential equations of any even order and the corresponding eigenfunction expansions. — A non-separable translation invariant extension of the Lebesgue measure space (collab. with S. Kakutani). — Harmonic integrals, part II. — The theorem of Riemann-Roch on compact analytic surfaces. — Green's forms and meromorphic functions on compact analytic varieties. — The theorem of Riemann-Roch for adjoint systems on 3-dimensional algebraic varieties. — On analytic surfaces with two independent meromorphic functions (collab. with W.-L. Chow). — On the theorem of Riemann-Roch for adjoint systems on Kählerian varieties. — Arithmetic genera of algebraic varieties. — The theory of harmonic integrals and their applications to algebraic geometry. — The theorem of Riemann-Roch for adjoint systems on Kählerian varieties. — Some results in the transcendental theory of algebraic varieties.

VOL. II: On arithmetic genera of algebraic varieties (collab. with D. C. Spencer). — On cohomology groups of compact analytic varieties with coefficients in some analytic faisceaux. — Groups of complex line bundles over compact Kähler varieties (collab. with D. C. Spencer). — Divisor class groups on algebraic varieties (collab. with D. C. Spencer). — On a differential-geometric method in the theory of analytic stacks. — On a theorem of Lefschetz and the lemma of Enriques-Severi-Zariski (collab. with D. C. Spencer). — On Kähler varieties of restricted type. — On Kähler varieties of restricted type (an intrinsic characterization of algebraic varieties). — Some results in the transcendental theory of algebraic varieties. — Characteristic linear systems of complete continuous systems. — On the complex projective spaces (collab. with F. Hirzebruch). — On the variation of almost-complex structure (collab. with D. C. Spencer). — On deformations of complex analytic structures, I-II (collab. with D. C. Spencer). — On the existence of deformations of complex analytic structures (collab. with L. Nirenberg and D. C. Spencer). — A theorem of completeness for complex analytic fibre spaces (collab. with D. C. Spencer). — Existence of complex structure on a differentiable family of deformations of compact complex manifolds (collab. with D. C. Spencer). — A theorem of completeness of characteristic systems of complete continuous systems (collab. with D. C. Spencer). — On deformations of complex analytic structures, III; stability theorems for complex structures (collab. with D. C. Spencer). — On deformations of some complex pseudo-group structures. — Multifoliate structure (collab. with D. C. Spencer).

VOL. III: On compact analytic surfaces. — On compact complex analytic surfaces, I. — A theorem of completeness for analytic systems of surfaces, with ordinary singularities. — A theorem of completeness of characteristic systems for analytic families of compact submanifolds of complex manifolds. — On stability of compact submanifolds of complex manifolds. — On compact analytic surfaces, II, III. — On the structure of compact complex analytic surfaces. — On the structure of compact complex analytic surfaces, II. — On the structure of compact complex analytic surfaces. — On the structure of compact complex analytic surfaces, I. — On characteristic systems of families of surfaces with ordinary singularities in a projective space. — Complex structures on  $S^1 S^3$ . — On the structure of compact complex analytic surfaces, II. — A certain type of irregular algebraic surfaces. — Pluricanonical systems on algebraic surfaces of general types. — On the structure of complex analytic surfaces, III. — Pluricanonical systems on algebraic surfaces of general type. — On the structure of complex analytic surfaces, IV. — On homotopy K3 surfaces. — Holomorphic mappings of polydiscs into compact complex manifolds.

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Preliminaries. — Weak and strong fundamental sequences. — *W*-shapes and *S*-shapes. — *W*-shapes and *S*-shapes of pointed spaces. — Movable spaces. Extensions of *W*-sequences and of *S*-sequences. — Shapes of compacta. — FAR-shapes and FAN *R*-spaces. — ANR-sequences and the theory of shape. — On complements of compacta lying in  $Q$  or in  $E^n$ . — Positions of sets in spaces. — A survey of various results and problems of shape theory.

**Limit theorems of probability theory.** — Edited by P. Révész. — *Colloquia mathematica societatis Janos Bolyai*, vol. 11. — Un vol. relié,  $17 \times 24,5$ , de 420 p. — North Holland Publishing Co., Amsterdam/London, 1975.

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C. GILORMINI; G. HIRSCH. — **Equations différentielles.** — Cours — exercices — tests. — Collection « Comprendre et appliquer », mathématiques pratiques élémentaires, vol. 5. — Un vol. broché, 18 × 24, de v, de 47 p. — Prix: FF 20.00. — Masson, Paris, 1975.

Généralités sur les équations différentielles. — Equations différentielles du premier ordre. — Equations différentielles linéaires du second ordre à coefficients constants. — Equations différentielles se ramenant aux équations précédentes. — Déterminations approchée de la solution d'une équation différentielle du premier ordre. — Tests généraux d'assimilation.

A. HOCQUENGHEM; P. JAFFARD; R. CHENON. — **Mathématiques.** — Tome 1, éléments de calcul différentiel et intégral. — Collection du Conservatoire national des arts et métiers, 5<sup>e</sup> édition révisée et complétée. — Un vol. relié, 17 × 24,5, de xvi, de 556 p. — Prix: FF 90.00. — Masson, Paris, 1975.

Livre premier: *Calcul différentiel*: Ensembles, algèbre, géométrie analytique. Dénombrements. Nombres réels. Généralités sur les fonctions réelles d'une variable réelle (étude locale). Généralités sur les fonctions (étude globale). Dérivées. Le théorème de Rolle et ses applications. Logarithmes, exponentielles, puissances. Fonctions trigonométriques, circulaires et hyperboliques. La formule de Taylor et ses conséquences. Formes indéterminées. Courbes. — Livre II: *Éléments de calcul intégral*: Nombres complexes. Polynômes. Equations algébriques. Fractions rationnelles et fonctions rationnelles. Fonctions à valeurs complexes. Intégrales définies. Primitives simples. Primitives des fractions rationnelles. Généralisation de la notion d'intégrale définie. Equations différentielles du premier ordre. Notions sur les équations différentielles d'ordre supérieur au premier. — Livre III: *Éléments de calculs géométriques*: Géométrie analytique de l'espace. Dérivées partielles. Différentielles. Calculs numériques. Résolution numérique des équations. Vecteurs variables. Constructions des courbes paramétriques et polaires. Courbes d'équations  $f(x, y) = 0$ . Courbes algébriques. Intégrales abéliennes. Courbes définies géométriquement. Enveloppes. Intégrales multiples. Applications géométriques des intégrales. Compléments sur les équations différentielles. Résolution numérique approchée des équations différentielles. Espaces vectoriels. Applications linéaires. Calcul matriciel. Espaces euclidiens. Changement de base.

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Les promenades aléatoires. — Chaînes de Markov à espace d'états discret. — Chaînes de Markov à espaces d'état continu. — Processus de Poisson. — Processus de Markov à espace d'états discret. — Introduction aux modèles de files d'attente. — Les processus de renouvellement.

Yvette AMICE. — **Les nombres  $p$ -adiques.** — Collection SUP, Le mathématicien, vol. 14. — Un vol. broché, 13 × 21, de 189 p. avec figures. — Presses universitaires de France, Paris, 1975.

*Construction des nombres  $p$ -adiques*: Suites de congruences. Les entiers  $p$ -adiques. Développement de Hensel des entiers  $p$ -adiques. La valuation de  $Z_p$ . Le corps  $Q_p$  des nombres  $p$ -adiques. L'espace métrique  $Q_p$ . Les valeurs absolues de  $Q$ . Les valeurs absolues des corps de nombres. *Les corps valués ultramétriques*: Valuations et valeurs absolues

ultramétriques. Propriétés métriques. Corps valués ultramétriques complets. Racines de l'unité. Polynômes irréductibles. Extensions algébriques finies d'un corps ultramétrique. Corps valués complets algébriquement clos. — *Espaces de Banach ultramétriques* : Espaces de Banach. Exemples de bases normales. Produits tensoriels. Exemples de produits tensoriels complétés. Algèbres de Banach. — *Fonctions analytiques* : Séries entières et fonctions analytiques. Séries de Laurent. Polygone de Newton. Lemme de Hensel. Fonctions analytiques sur une couronne. Exemples. Prolongement analytique. Lemniscates. — *Théorèmes de rationalité* : Introduction. Critères algébriques, déterminants. Le théorème de Borel-Dwork. Le théorème de Polya-F. Bertrandias. Lemniscates dans le plan complexe.

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*Classification et reconnaissance des formes* : Introduction. Classification des formes. Recherche des agrégats. Théorie binaire des images. Théorie floue des images. Grammaires et langages d'images. Théorie formelle des fichiers. Théorie floue des fichiers. — *Automates et systèmes* : Introduction. Rappel sur la théorie des automates finis. Notion d'automate fini flou. Rappel sur la théorie des machines de Turing. Machines de Turing floues. Algorithmes flous. Systèmes formels. Systèmes flous. — *Choix des critères et décision* : Introduction. Choix multicritères. Décision dans un univers flou. Qualification des résultats. *Annexe G* : Utilisation de sous-relations floues comme des sous-matrices. *Annexe H* : Sous-ensemble flou convexe. *Annexe I* : Sous-ensemble flou optimisant. *Annexe J* : Utilisation d'algorithmes de plus forts chemins pour les graphes flous.

M. BRAUN. — **Differential equations and their applications.** — An introduction to applied mathematics. — Applied mathematical sciences, vol. 15. — Un vol. broché, 15 × 23,5, de XIV, de 718 p. avec figures. — Prix: DM 36.20. — Springer Verlag, New York/Heidelberg/Berlin, 1975.

First order differential equations. — Second order differential equations. — Systems of first order equations. — Qualitative theory of differential equations. — Separation of variables and Fourier series. — *Appendices* : Some simple facts concerning functions of several variables. Sequences and series. Introduction to APL.

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*Espaces topologiques et espaces métriques* : La droite  $R$  et l'espace  $R^n$ . Espaces topologiques. Espaces métriques. — *Fonctions numériques* : Fonctions numériques définies sur un espace topologique. Fonctions numériques semicontinues. Théorème de Stone-Weierstrass. Fonctions définies sur un intervalle. Fonctions convexes. Moyennes et inégalités. — *Espaces vectoriels topologiques* : Espaces vectoriels topologiques généraux.

Topologie associée à une famille de semi-normes. Topologie associée à une norme. Comparaison des normes. Formes linéaires sur les espaces normés. Applications linéaires compactes. Espaces normés de dimension finie. Famille sommable de nombres réels ou complexes. Séries. Séries et familles sommables de fonctions. Familles mutlipliables et produits infinis de nombres complexes. Algèbres normées. Systèmes orthogonaux. Polynômes orthogonaux.

G. CAGNAC; E. RAMIS; J. COMMEAU. — **Traité de mathématiques spéciales.** — Vol. 4, applications de l'analyse à la géométrie. — 4<sup>e</sup> édition revue. — Un vol. broché, 16 × 24, de VIII, de 467 p. avec figures. — Masson, Paris, 1975.

Compléments d'analyse. Notion de courbe. Courbes planes déterminées par une représentation paramétrique. Courbes gauches déterminées par une représentation paramétrique. Courbes planes représentées par une équation polaire. Courbes représentées par une équation  $f(x, y) = 0$ . Enveloppe d'une famille de courbes planes. Plans tangents aux surfaces. Enveloppes dans l'espace. Longueur d'un arc. Courbure. Torsion. Applications géométriques des équations différentielles. Intégrale curviligne. Intégrale double. Intégrale de surface. Intégrale triple. Applications du calcul intégral à la mécanique. Analyse vectorielle. *Appendice* : Propriétés métriques des surfaces.

William M. BOOTHBY. — **An introduction to differentiable manifolds and Riemannian geometry.** — Pure and applied mathematics, a series of monographs and textbooks. vol. 63. — Un vol. relié, 16 × 24, de XIV, 424 p. — Prix: £22.50. — Academic Press, New York/San Francisco/London, 1975.

*Introduction to manifolds* : Preliminary comments on  $R^n$ .  $R^n$  and Euclidean space. Topological manifolds. Further examples of manifolds. Cutting and pasting. Abstract manifolds. Some examples. — *Functions of several variables and mappings* : Differentiability for functions of several variables. Differentiability of mappings and Jacobians. The space of tangent vectors at a point of  $R^n$ . Another definition of  $T_a(R^n)$ . Vector fields on open subsets of  $R^n$ . The inverse function theorem. The rank of a mapping. — *Differentiable manifolds and submanifolds* : The definition of a differentiable manifold. Further examples. Differentiable functions and mappings. Rank of a mapping. Immersions. Submanifolds. Lie groups. The action of a Lie group on a manifold. Transformation groups. The action of a discrete group on a manifold. Covering manifolds. — *Vector fields on a manifold* : The tangent space at a point of a manifold. Vector fields. One-parameter and local one-parameter groups acting on a manifold. The existence theorem for ordinary differential equations. Some examples of one-parameter groups acting on a manifold. One-parameter subgroups of Lie groups. The Lie algebra of vector fields on a manifold. Frobenius' theorem. Homogeneous spaces. — *Tensors and tensor fields on manifolds* : Tangent covectors. Bilinear forms. The Riemannian metric. Riemannian manifolds as metric spaces. Partitions of unity. Tensor fields. Multiplication of tensors. Orientation of manifolds and the volume element. Exterior differentiation. — *Integration of manifolds* : Integration in  $R^n$ . Domains of integration. A generalization to manifolds. Integration on Lie groups. Manifolds with boundary. Stoke's theorem for manifolds with boundary. Homotopy of mappings. The fundamental group. Some applications of differential forms. The de Rham groups. Some further applications of de Rham groups. Covering spaces and the fundamental group. — *Differentiation on Riemannian manifolds* : Differentiation of vector fields along curves in  $R^n$ . Differentiation of vector fields on submanifolds of  $R^n$ . Differentiation on Riemannian manifolds. Addenda to the theory of differentiation on a

manifold. Geodesic curves on Riemannian manifolds. The tangent bundle and exponential mappings. Normal coordinates. Some further properties of geodesics. Symmetric Riemannian manifolds. Some examples. — *Curvature*: The geometry of surfaces in  $E^3$ . The Gaussian and mean curvatures of a surface. Basic properties of the Riemann curvature tensor. The curvature forms and the equations of structure. Differentiation of covariant tensor fields. Manifolds of constant curvature.

Gaisi TAKEUTI. — **Proof theory.** — Studies in logic and the foundations of mathematics, vol. 81. — Un vol. relié,  $15,5 \times 23$ , de VII, 372 p. — Dfl 85.00. — North Holland Publishing Company/American Elsevier Publishing Company, Amsterdam/Oxford/New York, 1975.

*First order systems: First order predicate calculus*: Formalization of statements. Formal proofs and related concepts. A formulation of intuitionistic predicate calculus. Axiom systems. The cut-elimination theorem. Some consequences of the cut-elimination theorem. The predicate calculus with equality. The completeness theorem. *Peano arithmetic*: A formulation of Peano arithmetic. The incompleteness theorem. A discussion of ordinals from a finitist standpoint. A consistency proof of PA. Provable well-orderings. An additional topic. — *Second order and finite order systems: Second order systems and simple type theory*: Second order predicate calculus. Some systems of second order predicate calculus. The theory of relativization. Truth definition for first order arithmetic. The interpretation of a system of second order arithmetic. Simple type theory. The cut-elimination theorem for simple type theory. *Infinitary logic*: Infinitary logic with homogeneous quantifiers. Determinate logic. A general theory of heterogeneous quantifiers. — *Consistency problems: Consistency proofs*: Introduction. Ordinal diagrams. A consistency proof of second order arithmetic with the  $\pi_1^1$ -comprehension axiom. A consistency proof for a system with inductive definitions. *Some applications of consistency proofs*: Provable well-orderings. The  $\pi_1^1$ -comprehension axiom and the  $\omega$ -rule. Reflection principles.

**Differential games and control theory.** — Ed. by Emilio O. Roxin, Pan-Tai Liu and Robert L. Sternberg. — Lecture notes in pure and applied mathematics, vol. 10. — Un vol. broché,  $17,5 \times 25,5$  de x, 412 p. — Prix: \$24.50. — Marcel Dekker, New York, 1974.

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Brayton GRAY. — **Homotopy theory: an introduction to algebraic topology.** — Pure and applied mathematics, vol. 64. — Un vol. relié, 16 × 23,5, de ix, 368 p. — Prix: \$22.00. — Academic Press, New York/San Francisco/London, 1975.

Preliminaries. — Some simple topological spaces. — Some simple topological problems. — Homotopy theory. — Category theory. — The fundamental group. — More on the fundamental group. — Calculating the fundamental group. — A convenient category of topological spaces. — Track groups and homotopy groups. — Relative homotopy groups. — Locally trivial bundles. — Simplicial complexes and linearity. — Calculating homotopy groups: the Blakers-Massey theorem. — The topology of CW complexes. — Limits. — The homotopy theory of CW complexes. —  $K(\pi, n)$ 's and Postnikov systems. — Spectral reduced homology and cohomology theories. — Spectral unreduced homology and cohomology theories. — Ordinary homology of CW complexes. — Homology and cohomology groups of more general spaces. — The relation between homotopy and ordinary homology. — Multiplicative structure. — Relations between chain complexes. — Homological algebra over a principal ideal domain: Künneth and universal coefficient theorems. — Orientation and duality. — Cohomology operations. — Adem relations. —  $K$ -theories. — Cobordism.

**Discrete subgroups of Lie groups and applications to moduli.** — Papers presented at the Bombay colloquium, 1973. — Tata Institute of Fundamental Research Studies in Mathematics, vol. 7. — Un vol. broché, 15 × 23, de vi, 348 p. — Prix: £7.95. — Published for the Tata Institute of Fundamental Research, Bombay, by Oxford University Press, Oxford, 1975.

*Walter L. Baily, Jr.*: Fourier coefficients of Eisenstein series on the Adele group. — *Eberhard Freitag*: Automorphy factors of Hilbert's modular group. — *Howard Garland*: On the cohomology of discrete subgroups of semi-simple Lie groups. — *Phillip Griffiths and Wilfried Schmid*: Recent developments in Hodge theory: a discussion of techniques and results. — *G. Harder*: On the cohomology of discrete arithmetically defined groups. — *Yasutaka Ihara*: On modular curves over finite fields. — *G. D. Mostow*: Strong rigidity of discrete subgroups and quasi-conformal mappings over a division algebra. — *David Mumford*: A new approach to compactifying locally symmetric varieties. — *M. S. Raghunathan*: Discrete groups and  $Q$ -structures on semi-simple Lie groups. — *E. B. Vinberg*: Some arithmetical discrete groups in Lobacevskii spaces.

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1. Teil: *Entscheidungstheorie*: Modell der Entscheidungstheorie: Spiel- und Entscheidungstheorie. Struktur von Entscheidungsproblemen. Entscheidungsbäume und Graphentheorie. Grundmodell der Entscheidungstheorie. — Elemente der Wahrscheinlichkeitsrechnung: Einleitung. — Risikosituation. — Moderne Nutzentheorie. — 2. Teil: *Spieltheorie*: Einführung und Überblick. — Extensive Form und Reduktion auf Normal- und Matrixform. — Das 2-Personen-Nullsummenspiel in Normal- und Matrixform. — Gemischte Strategie und gemischte Erweiterung. — Lösungsmethoden für 2-Personen-Nullsummenspiele; Querverbindung zur linearen Optimierung. — Einige Bemerkungen zu den 2-Personen-Nichtnullsummenspielen (N-NS-Spiele). — 3. Teil: *Statistische Entscheidungstheorie*: Einleitung. — Beispiel aus der Qualitätskontrolle (Testen einer einfachen Hypothese gegen eine einfache Alternative). — Erste Ansätze zu den Lösungsmethoden. Querverbindung zur „klassischen Statistik“. — Allgemeine Betrachtungen über das statistische Entscheidungsproblem. — Das Bayes'sche Kriterium. — Beispiel aus der Produktionsplanung. — Beispiel eines zweistufigen statistischen Entscheidungsverfahrens. — Verallgemeinerung des Testproblems in Kapitel 12. Unendlicher Zustandsraum. Risikosituation. — Lösung eines statistischen Schätzproblems im Falle der ungünstigsten a priori-Verteilung. — Bemerkungen zum Wert der Information bei entscheidungstheoretischen Problemen. — Mathematischer Anhang 1: Beweis des Hauptsatzes für 2-Personen-Nullsummenspiele. — Mathematischer Anhang 2: Beweis der Optimalität der rekursiven Analyse.

Daniel GALLIN. — **Intensional and higher-order modal logic with applications to Montague semantics.** — North Holland Mathematics Studies, vol. 19. — Un vol. broché, 16,5 × 24, de vii, 148 p. — Prix: Dfl 26.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1975.

*Part I: Intensional logic*: Natural language and intensional logic. The logic *IL*. Generalized completeness of *IL*. Persistence in *IL*. — Alternative formulations of *IL*: Modal *T*-logic. Extensions of *IL* and *ML<sub>T</sub>*. Normal forms. Two-sorted type theory. — *Part II: Higher-order modal predicate logic*. Propositions in *ML<sub>p</sub>*. Atomic propositions and *EC*. Propositional operators. Relative strength of *IL* and *ML<sub>p</sub>*. — Algebraic semantics: Boolean models of *ML<sub>p</sub>*. Modal independence results. Topological models of *ML<sub>p</sub>*. Cohen's independence results.

Igor KLUVANEK; Greg KNOWLES. — **Vector measures and control systems.** — North Holland Mathematics Studies, vol. 20. — Notas de matematica, vol. 58. — Un vol. broché, 16,5 × 24, de ix, 180 p. — Prix: Dfl 35.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1976.

*Preliminaries*: Locally convex spaces. Extreme and exposed points. Measure spaces. Conical measures. — *Vector measures and integration*: Vector measures; variation and semi-variation. Integration. Integrability of bounded functions. Limit theorems. A sufficient condition for integrability. An isomorphism theorem. Direct sum of vector measures. — *Function spaces I*: Topologies. Some relations between topologies. Completeness. Lattice completeness. Weak compactness. Completion. Extreme and exposed points. Vector-valued functions. — *Closed vector measures*: Properties of the integration mapping. Closed vector measures. Closure of a vector measure. Completeness of  $L^1(m)$ . Lattice completeness. Weak compactness of the range. Sufficient conditions for closedness. — *Liapunov vector measures*: Liapunov vector measures. Consequences of the test. Liapunov decomposition. Moment sequences. Liapunov extension. Non-atomic vector

measures. Examples of bang-bang control. — *Extreme and exposed points of the range*: Extreme points. Properties of the set of extreme points. Rybakov's theorem. Exposed points of the range. — *The range of a vector measure*: The problem. The conical measure associated with a vector measure. The relation between  $m$  and  $\Lambda(m)$ . Consequences of the test. — *Function spaces II*: Set-valued functions. Measurable selections. Sequences of measures. Extreme points. — *Control systems*: Attainable set. Extreme points of the attainable set. Liapunov control systems. Non-atomic control systems. Time-optimal control.

Victor E. MCGEE. — **Principes de statistiques: approches traditionnelle et bayésienne.** — Traduit de l'américain par Alain Pigois et Auguste Fercoq. — Un vol. broché, 16 × 24, de 410 p. — Vuibert, Paris, 1975.

*L'approche traditionnelle: Populations, échantillons et nombres représentatifs*: Introduction. Le point de vue de l'expérimentateur. Le point de vue du statisticien. Coopération entre l'expérimentateur et le statisticien. — *Nombres résumés usuels (paramètres descriptifs)*: Quelques exercices de mise en train. Paramètres statistiques les plus importants. La variable centrée réduite. Paramètre statistique indiquant la relation existant entre deux ensembles de données. Quelques remarques finales. — *Modèles statistiques utiles (population et plan d'échantillonnage)*: Introduction. La loi normale. Échantillonnage à partir d'une distribution normale. Distribution d'échantillonnage de la moyenne. — *Distributions d'échantillonnage les plus courantes*: Introduction. Distribution d'échantillonnage de la moyenne. Distribution d'échantillonnage de la variance. La distribution du chi deux. La distribution. La distribution de  $F$ . La distribution binomiale. Distribution multinomiale. — *Le test  $t$* : Introduction. Cas 1: une seule moyenne d'échantillon. Cas 2: le test  $t$  dans le cas de mesures dépendantes. Cas 3: le test  $t$  dans le cas de mesures indépendantes. — *Le test  $F$ ; analyse simple de variances*: Introduction. Analyse simple de variance. Deux démonstrations. — *Le test  $F$ ; analyse de variance à double entrée*: Analyse de variance à double entrée. Analyse de variance à double entrée dans le cas particulier où il y a un seul élément par case. — *Le test de la qualité de l'ajustement du chi-deux*: Introduction. Comparaison des distributions d'échantillonnage et des distributions de population. Tester l'indépendance. Tables de contingence deux par deux. Table de contingence  $R$  par  $C$ . — *Corrélation et régression*: Le coefficient de corrélation. Régression simple. — *L'approche-bayésienne: Fondements du raisonnement plausible*: Introduction. Le modèle de raisonnement plausible. Le théorème de Bayes. — *Règles d'un comportement rationnel*: Introduction. L'attribution de probabilités. Prise en compte de nouvelles informations. Quelques exemples et leurs solutions.

J. GENET; G. PUPION. — **Analyse moderne: résumé de cours et exercices corrigés.** — Tome 1: espaces métriques, séries, systèmes différentiels. — Un vol. broché, 16 × 24, de 340 p. — Vuibert, Paris, 1971.

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tions: Convergence simple et convergence uniforme. Théorèmes fondamentaux. B) Séries de fonctions: Convergence simple et convergence uniforme. Théorèmes fondamentaux. — *Séries entières d'une variable réelle ou complexe*: Propriétés générales. Opérations algébriques. Séries entières réelles. Fonctions développables en séries entières. Fonctions  $z \mapsto e^z$ ,  $\operatorname{ch} z$ ,  $\operatorname{sh} z$ ,  $\sin z$ ,  $\cos z$ . Applications. — *Séries de Fourier*: Définitions générales. Fonctions développables en séries de Fourier. Egalité de Parseval. Cas des fonctions de période  $T \neq 2\pi$ . Bases orthogonales. — *Suites et séries dans un E.V.N.*: A) Suites et séries dans un E.V.N.: Suites dans un E.V.N. Séries dans un E.V.N. Définition de  $e^A$  et  $e^L$ . B) Suites et séries de fonctions à valeurs dans un Banach: Définitions diverses. Suites de fonctions  $f_n: (a, b) \mapsto E$  Banach. Séries de fonctions  $f_n: (a, b) \mapsto E$  Banach. Résolution des systèmes différentiels  $X' = AX$ . — *Systèmes différentiels et équations différentielles linéaires à coefficients constants. Techniques de résolution*: Introduction. Propriétés élémentaires et existence des solutions. Méthodes pratiques. Systèmes homogènes. Recherche des solutions réelles. Méthodes pratiques. Systèmes  $X' = AX + Y$ . Equations différentielles linéaires à coefficients constants.

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*Isometric embedding*: Introduction. Isometric embedding in Hilbert space. Functions of negative type. Radial positive definite functions. A characterization of subspaces of  $L^p$ ,  $1 \leq p \leq 2$ . — *The classes  $N(X)$  and  $RPD(X)$ : Integral representations*: Radial positive definite functions on  $\mathbf{R}^n$ . Positive definite functions on infinite-dimensional linear spaces. Functions of negative type on  $L^p$  spaces. Functions of negative type on  $\mathbf{R}^n$ . — *The extension problem for contractions and isometries*: Formulation. The Kirszbraun intersection property. Extension of contractions for pairs of Banach spaces. Special extension problems. — *Interpolation and  $L^p$  inequalities*: A multi-component Riesz-Thorin theorem.  $L^p$  inequalities. A packing problem in  $L^p$ . — *The extension problem for Lipschitz-Hölder maps between  $L^p$  spaces*:  $K$ -functions and an extension procedure for bilinear forms. Examples of  $K$ -functions. The contraction extension problem for the pairs  $(L^q, L^p)$ .

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*Part A: The basic theory: Admissible set theory*: The role of urelements. The axiom of  $KPU$ . Elementary parts of set theory in  $KPU$ . Some derivable forms of separation and replacement. Adding defined symbols to  $KPU$ . Definition by  $\Sigma$  recursion. The collapsing lemma. Persistent and absolute predicates. Additional axioms. — *Some admissible sets*: The definition of admissible set and admissible ordinal. Hereditarily finite sets. Sets of hereditary cardinality less than a cardinal  $K$ . Inner models: the method of interpretations. Constructible sets with urelements;  $HYP_m$  defined. Operations for generating the constructible sets. First order definability and substitutable functions. The truncation lemma. The Lévy absoluteness principle. — *Countable fragments of  $L_{\infty\omega}$* . Formalizing syntax and semantics in  $KPU$ . Consistency properties.  $m$ -logic and the omitting types theorem. A weak completeness theorem for countable fragments. Completeness and compactness for countable admissible fragments. The interpolation theorem. Definable well-orderings. Another look at consistency properties. — *Elementary results on  $HYP_m$* : On set existence. Defining  $\pi_1^1$  and  $\Sigma_1^1$  predicates.  $\pi_1^1$  and  $\Delta_1^1$  on countable structures. Perfect set results. Recursively saturated structures. Countable  $m$ -admissible ordinals. Representability in  $m$ -logic. — *Part B: The absolute theory: The recursion theory of  $\Sigma_1^1$  predicates on admissible sets*: Satisfaction and parametrization. The second recursion theorem for  $KPU$ . Recursion along well-founded relations. Recursively listed admissible sets. Notation systems and projections of recursion theory. Ordinal recursion theory: projectible and recursively inaccessible ordinals. Ordinal recursion theory: stability. Shoenfield's absoluteness lemma and the first stable ordinal. — *Inductive definitions*: Inductive definitions as monotonic operators.  $\Sigma$  inductive definitions on admissible sets. First order positive inductive definitions and  $HYP_m$ . Coding  $HF$  on  $m$ . Inductive relations on structures with pairing. Recursive open games. — *Part C: Towards a general theory: More about  $L_{\infty\omega}$* : Some definitions and examples. A weak completeness theorem for arbitrary fragments. Pinning down ordinals: the general case. Indiscernibles and upward Löwenheim-Skolem theorems. Partially isomorphic structures. Scott sentences and their approximations. Scott sentences and admissible sets. — *Strict  $\pi_1^1$  predicates and König principles*: The König infinity lemma. Strict  $\pi_1^1$  predicates:

preliminaries. König principles on countable admissible sets. König principle  $K_1$  and  $K_2$  on arbitrary admissible sets. König's lemma and Nerode's theorem: a digression. Implicit ordinals on arbitrary admissible sets. Trees and  $\Sigma_1$  compact sets of cofinality  $\omega$ .  $\Sigma_1$  compact sets of cofinality greater than  $\omega$ . Weakly compact cardinals.

YVES HEBERT. — **Mathématiques, probabilités et statistique.** — Cours et exercices. — Troisième édition, revue et corrigée. — Un vol. broché,  $16 \times 24$ , de vi, 415 p., tables et figures. — Vuibert, Paris, 1974.

Ensembles usuels de nombres. — Puissances. Radicaux. Exposants. — Rappels de notions utiles d'algèbre élémentaire. — Vecteurs. Coordonnées. — Trigonométrie. — Fonctions. Généralités. — Eléments de géométrie analytique plane. Graphes cartésiens de fonctions usuelles. Coordonnées polaires. — Dérivées, application à l'étude de la variation des fonctions. — Primitives. Intégrales. — Progressions. Logarithmes. Fonction logarithmique. Fonction exponentielle. Fonction puissance. — Procédés d'intégration. — Equations différentielles. — Développements limités. — Les nombres complexes. — Analyse combinatoire. Triangle de Pascal. Binôme de Newton. — Probabilités. Notions générales. — Variables aléatoires discrètes d'ordre fini. Lois de probabilité. — Loi binomiale. Notion de variable aléatoire continue. Densité de probabilité. — Loi binomiale. Notion de variable aléatoire continue. Densité de probabilité. Loi normale. Courbe de Gauss. Loi de Poisson. — Statistique. Notions générales. — Lois statistiques. Problèmes de jugements sur échantillons. — Régression linéaire. Corrélation. — Usage des tables numériques. — Représentations graphiques de fonctions définies par points.

H. B. GRIFFITHS, P. J. HILTON. — **Klassische Mathematik in zeitgemässer Darstellung.** — Band 1, Grundlagen, Mengenlehre und Arithmetik. — Studia mathematica/Mathematische Lehrbücher, Bd. 26.— Un vol. broché,  $15 \times 23$ , de 223 p., avec 28 figures. — Prix: DM 27.00. — Vandenhoeck & Ruprecht in Göttingen/Zürich, 1976.

*Die Sprache der Mathematik: Mengenlehre als Beschreibungshilfsmittel:* Der Mengenbegriff. Inklusion. Venn-Diagramme. Gleichheit von Mengen. Die Potenzmengenbildung. Vereinigung und Durchschnitt. Die Komplementbildung. Quantoren. — *Funktionen als Beschreibungshilfsmittel:* Der Funktionsbegriff. Gleichheit von Funktionen. Das Bild. Injektionen, Surjektionen und Bijektionen. Beispiele. Bezeichnungen und sprachliche Ungenauigkeiten. Zusammensetzung von Funktionen. Zusammensetzung von Injektionen usw. Der Satz von der Umkehrfunktion. Äquivalente Mengen. Das Zählen. — *Das Cartesische Produkt:* Paare und Produkte. Algebraische Eigenschaften. Der Graph einer Funktion. Nochmals: Der Funktionsbegriff. Nochmals: Geordnete Paare. Multiplikative Systeme. — *Relationen:* Was ist eine Relation? Die Bedingungen RST. Lineare Graphen. Ordnungen. Äquivalenzrelationen. Klasseneinteilungen. Die Quotientenabbildung. — *Vollständige Induktion:* Unvollständige und vollständige Induktion. Eine Unsitte. Das Verfahren der Induktiven Definition. — *Weiteres über Mengen: Funktionenmengen:* Die Menge  $B^A$ . Abbildungen von  $B^A$ . Der Fall  $\# B = 2$ . Variationen, Permutationen und die Mengen  $I(A, B)$ . Kombinationen. Die Menge  $S(A, B)$ . — *Zählen und Transfinite Arithmetik:* Das Zählen. Transfinite Arithmetik. Die Ordnungsrelation in der transfiniten Arithmetik. Das Auswahlaxiom. — *Mengenalgebra und Aussagenalgebra:* Mengenalgebra.  $B$ -Algebren. Der Aussagenkalkül. Erweiterung auf allgemeinere Formeln. Implikation und Folgerung. — *Arithmetik: Kommutative Ringe und Körper:* Die ganzen Zahlen als algebraisches System. Ringe. Folgerungen.

Unterringe. Kommutative Gruppen. Körper. — *Arithmetik modulo  $m$* : Restklassen und die Ringe  $\mathbf{Z}_m$ . Eigenschaften von  $\mathbf{Z}_m$ . Die Eulersche  $\varphi$ -Funktion. Das Lösen von Kongruenzen. — *Ringe mit ganzzahliger Norm*: Ganzzahlige Normen. Beispiele. Faktorzerlegung in euklidischen Ringen. Ideale. Grösste gemeinsame Teiler. Der euklidische Algorithmus. Kleinste gemeinsame Vielfache. — *Zerlegung in Primfaktoren*: Primzahlen. Unzerlegbare Elemente und Primelemente. Existenz und Eindeutigkeit der Primfaktorzerlegung. Faktorzerlegung in  $\mathbf{Z}[x]$ . — *Anwendungen des grössten gemeinsamen Teilers*: Partialbruchzerlegung. Kettenbrüche.

Gh. MIHOC, G. CIUCU, Aneta MUJA. — **Modele matematice ale așteptării.** — Un vol. relié,  $17,5 \times 24,5$ , de 464 p. avec tables. — Prix: Leu 26.00. — Editura academiiei republicii socialiste România, Bucuresti, 1973. — En roumain.

**Traduction anglaise de la table des matières:** *General concepts on queueing systems*: General description of queueing models. The elements of a queueing system. Characteristics of the queueing model Classification of queueing models. — *Queueing systems with one station*: The  $M/M/1$  system. The  $M/E_k/1$  queueing system. The  $E_k/M/1$  system. The  $E_k/E_k/1$  system. Systems with arrival flux and (or) determinate servicing time. The  $M/G/1$  queueing system. The  $GI/M/1$  system. The  $GI/G/1$  queueing system. Kendall's method for the study of non-Markovian queueing models. — *Queueing systems with several stations*: The  $M/M/S$  system ( $S < \infty$ ). The  $M/M/S$  system ( $S = \infty$ ). The  $M/D/S$  queueing system. The  $GI/M/S$  system. Waiting time in the  $GI/G/S$  system. Models with  $S$  station in series. — *Systems with restrictions*: The  $M/M/S$  system with bounded waiting time. The  $M/M/S$  system with bounded cummulated waiting time. Gnedenko's method on the study of the waiting time in the  $M/G/1$  system. The limit repartition of the waiting time in the  $GI/G/S$  systems with bounded waiting time (in the system). Models with finite capacity. — *The discipline of the queueing line*: Priority models. Models with pre-emptive priorities. Orientation time in queueing systems with pre-emptive priorities. Models where priority is assigned by classification of the units. Models where the units are chosen for servicing at random. Cases when servicing is accomplished according to the principle "last arrived first served". Models with  $S$  stations in parallel without information. Cyclic queues. The discipline of the queueing system in  $M/M/1$  system with restrictions and units of different kinds. — *Models with arrivals or/and bulk services*:  $GI/M/1$  system with bulk arrivals and individual services.  $M/G/1$  model with bulk arrival. Monochannel models with individual arrivals and group services. Models with arrivals and bulk services. — *Application of the queueing theory*: Modelling methods. Applications in the field of equipment repairing and service. Application in production organization. Modelling of telephone systems. Applications in physics. Modelling of chemical processes.

John KNOPFMACHER. — **Abstract analytic number theory.** — North Holland Mathematical Library, vol. 12. — Un vol. relié,  $16 \times 23$ , de ix, 322 p. — Prix: Dfl 75.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1975.

*Part 1: Arithmetical semigroups and algebraic enumeration problems: Arithmetical semigroups*: Integral domains and arithmetical semigroups. Categories satisfying theorems of the Krull-Schmidt type. — *Arithmetical functions*: The Dirichlet algebra of an arithmetical semigroup. Infinite sums and products. Double series and products. Types of arithmetical functions. The zeta and Möbius functions. Further natural arithmetical functions.  $\zeta$ -formulae. — *Enumeration problems*: A special algebra homomor-

phism. Enumeration and zeta functions in special cases. Special functions and additive arithmetical semigroups. — *Part II: Arithmetical semigroups with analytical properties of classical type: Semigroups satisfying axiom A*: The basic axiom. Analytical properties of the zeta function. Average values of arithmetical functions. Approximate average values of special arithmetical functions. Asymptotic formulae with error estimates. — *Asymptotic enumeration, and further "statistical" properties of arithmetical functions*: Asymptotic enumeration in certain categories. Maximum orders of magnitude. Distribution functions of prime-independent functions. — *The abstract prime number theorem*: The fundamental theorem. Asymptotic properties of prime-divisor functions. Maximum and minimum orders of magnitude of certain functions. The "law of large numbers" for certain functions. — *Fourier analysis of arithmetical functions*: Algebraic and topological theory of Ramanujan sums. Fourier theory of even functions. Fourier theory of almost even functions. A wider type of almost evenness, and pointwise convergence of Ramanujan expansions. Arithmetical functions over  $G_z$ . — *Part III: Analytical properties of other arithmetical systems: Additive arithmetical semigroups*: Axiom C. Analytical properties of the zeta function. The additive abstract prime number theorem. Further additive prime number theorems. Asymptotic average values and densities. — *Arithmetical formations*: Natural examples. Characters and formations. The  $L$ -series of a formation. Axiom  $A^*$ . Analytical properties of  $L$ -series. Average values of arithmetical functions over a class. Abstract prime number theorem for formations.

Claude BERGE. — **Graphs and hypergraphs.** — North Holland Mathematical Library, vol. 6. — Translated by Edward Minieka. — Un vol. relié, 16 × 23, de ix, 528 p. ave figures. — Prix: Dfl 80.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1976.

*Part I: Graphs: Basic concepts*: Graphs. Basic definitions. List of symbols. — *Cyclic number*: Cycles and cocycles. Cycles in a planar graph. — *Trees and arborescences*: Trees and cotrees. Strongly connected graphs and graphs without circuits. Arborescences. Injective, functional and semi-functional graphs. Counting trees. — *Paths, centres and diameters*: The path problem. The shortest path problem. Centres and radii of a quasi-strongly connected graph. Diameter of a strongly connected graph. Counting paths. — *Flow problems*: The maximum flow problem. The compatible flow problem. An algebraic study of flows and tensions. The maximum tension problem. — *Degrees and demi-degrees*: Existence of a  $p$ -graph with given demi-degrees. Existence of a  $p$ -graph without loops with given demi-degrees. Existence of a simple graph with given degrees. — *Matchings*: The maximum matching problem. The minimum covering problem. Matchings in bipartite graphs. An extension of the König theorem. Counting perfect matchings. — *c-Matchings*: The maximum  $c$ -matching problem. Transfers. Maximum cardinality of a  $c$ -matching. — *Connectivity*:  $h$ -Connected graphs. Articulation vertices and blocks.  $k$ -Edge-connected graphs. — *Hamiltonian cycles*: Hamiltonian paths and circuits. Hamiltonian paths in complete graphs. Existence theorems for hamiltonian circuits. Existence theorems for hamiltonian cycles. Hamilton-connected graphs. Hamiltonian cycles in planar graphs (*abstract*). — *Covering edges with chains*: Eulerian cycles. Covering edges with disjoint chains. Counting eulerian circuits. — *Chromatic index*: Edge colourings. The Vizing theorem and related results. Edge colourings of planar graphs (*abstract*). — *Stability number*: Maximum stable sets. The Turán theorem and related results.  $\alpha$ -Critical graphs. Critical vertices and critical edges. Stability number and vertex coverings by paths. — *Kernels and Grundy functions*: Absorption number. Kernels. Grundy functions. Nim games. — *Chromatic number*: Vertex colourings.  $\gamma$ -Critical graphs. The Hajós theorem. Chromatic polynomials. Vertex colourings of

planar graphs (*abstract*). — *Perfect graphs*: Perfect graphs. Comparability graphs. Triangulated graphs. *i*-Triangulated graphs. Interval graphs. Cartesian product and Cartesian sum of simple graphs. — *Part II: Hypergraphs: Hypergraphs and their duals*: Hypergraphs. Cycles in a hypergraph. Conformal hypergraphs. Representative graph of a hypergraph. — *Transversals*: Matchings and *c*-matchings. Transversal number. — *Chromatic number of a hypergraph*: Stability number and chromatic number of a hypergraph. Cliques of a hypergraph. Good colourings of the edges of a graph. Generalizations of the chromatic number of a graph. — *Balanced hypergraphs and unimodular hypergraphs*: Strong chromatic number. Balanced hypergraphs. Unimodular hypergraphs. Stochastic functions. — *Matroids*: Matroid on a set. The Rado theorem and related results. Image of a matroid. Minimum weight basis.

Ivar EKELAND, Roger TEMAN. — **Convex analysis and variational problems.** — Studies in mathematics and its applications, vol 1. — Un vol. relié, 16 × 23, de VIII, 402 p. — Prix: Dfl 85.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1975.

*Part I: Fundamentals of convex analysis*: Convex functions. Minimization of convex functions and variational inequalities. Duality in convex optimization. — *Part II: Duality and convex variational problems*: Applications of duality to the calculus of variations (I). Applications of duality to the calculus of variations (II): problems of the type minimal hypersurfaces. Duality by the minimax theorem. Other applications of duality. — *Part III: Relaxation and non-convex variational problems*: Existence of solutions for variational problems. Relaxation of non-convex variational problems (I). Relaxation of non-convex variational problems (II). — *Appendix I: An a priori estimate in non-convex programming.* *Appendix II: Non-convex optimization problems depending on a parameter.*

M. A. DICKMANN. — **Large infinitary languages model theory.** — Studies in logic and the foundations of mathematics, vol. 83. — Un vol. relié, 16 × 23, de xv, 464 p. — Prix: Dfl 100.00.— North Holland/American Elsevier, Amsterdam/Oxford/New York, 1975.

*Preliminaries*: Set-theoretical background. — “Constructibly” defined inaccessible cardinals. A. The fixed-point method;  $\pi$ -numbers. B. Mahlo’s second method;  $\rho$ -numbers; hyperinaccessible numbers. — Filters and ultrafilters; ultraproducts; trees. A. Filters and ultrafilters. B. Ultraproducts. C. Trees. — Measurable cardinals. A. General facts about measures. B. Real-valued measures. C. Transition from real-valued measures to two-valued measures. D. Two-valued measures. — Partition calculus. — *The basic notions of infinitary languages*: Elementary syntax and semantics of the languages  $L_{\kappa\lambda}$ . A. Description. B. Relational structures. — Classification of formulas, model classes and maps. — *Some results from the model theory of  $L_{\omega\omega}$  and  $L_{\omega_1\omega}$* : Background on types and saturated structures. — Models generated by indiscernibles. A. Skolem functions. B. Indiscernibles; the Ehrenfeucht-Mostowski theorem. C. Applications. — Some results from the model theory of  $L_{\omega_1\omega}$ . A. Interpolation theorems. B. Some important consequences of the interpolation theorems. Definability theorems. Preservation theorems. C. Scott’s isomorphism theorem. — Counterexamples. — *General results*: Incompactness of accessible cardinals. — Incompactness results for inaccessible cardinals. — Larger cardinals. A. Applications of the ultraproduct construction to infinitary languages. B. Measurable cardinals. C. Weakly compact cardinals. D. Strongly compact cardinals. —

The downward Löwenheim-Skolem theorem. A. The main theorem and its corollaries. B. Counterexamples. C. Applications. — The upward Löwenheim-Skolem theorem and generalizations; Hanf numbers; Morley numbers. The finitary case. The infinitary case; Hanf numbers; Morley numbers. — *Infinitary languages with finite quantifiers*: The Hanf number of  $L_{k+\omega}$  and Morley numbers. Lower bounds for Hanf and Morley numbers. Omitting types; upper bounds for Morley numbers. Applications: non-definability of well-orderings in  $L_{k\omega}$ . Further Hanf number computations. A. Preliminary concepts and results. B. Accessible ordinals. C. Semi-accessible ordinals. D. Proof of the Barwise-Kunen-Morley theorem. — *Languages with infinite quantifiers*: The Hanf number of languages with infinite quantifiers. A. Upper bounds. B. Lower bounds. — The language  $L_{\theta\theta}$  for  $\theta$  strongly inaccessible. — Extension of partial isomorphisms. A. The back and forth argument. B. Partial isomorphisms and infinitary languages. C. The back and forth argument in a general setting. D. Logical and algebraic relations between models. E. Counterexamples. — Applications of the back and forth method. Application I. Direct products and sums. Application II. Free abelian groups. Application III. Direct products reduced modulo regular filters. Application IV. Infinitary properties of models generated by indiscernibles. — *Appendix A*: Induction for well-founded relations and the Shepherdson-Mostowski theorem. — *Appendix B*: An  $L_{\omega_1\omega_1}$  formula with no prenex form. — *Appendix C*: Axiomatizability, completeness and definability results. — *Appendix D*: Results on the constructible universe. — *Appendix E*: Real-valued measurable cardinals and the tree property.

Maurice ROSEAU. — **Asymptotic wave theory**. — North Holland series in applied mathematics and mechanics, vol. 20. — Un vol. relié, 15,5 × 23, de x, 349 p., avec figures. — Prix: Dfl 75.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1975.

*The Fourier-Laplace integral*: The Laplace transform. The direct problem. The inverse problem. Elementary rules. The Fourier transform in  $L^1$ . The Fourier transform in  $L^2$ . The Laplace transform (continued). The Mellin transform. — *Special functions*: *The gamma function*: A summation formula. The Eulerian definition of the function  $\Gamma(z)$ . The Laplace transform of  $t^\nu$ . The relation between the function  $\Gamma(z)$  and the group of linear mappings of the real line into itself. The error function. — *The Bessel functions*: Definitions. The Kepler equation and Bessel functions. The group of displacements in the plane and Bessel's functions. The Bessel functions of purely imaginary argument. The Hankel functions. Addition formulae for Bessel's functions. — *The wave equation*: Introduction. The reflexion and refraction of a plane wave at the interface between two homogeneous media. Spherical waves. Cylindrical waves. Group velocity. Wave guide. Successive reflexions of plane waves at two parallel rigid planes. The relation between spherical and plane waves. The reflexion of a spherical wave at a plane interface. An alternative approach to Weyl's formula. Poritsky's generalisation. — *Asymptotic methods*: Asymptotic expansion. The asymptotic expansion of Hankel's functions in the neighborhood of the point at infinity. The Laplace method. Asymptotic relations and Laplace's transform. The Laplace method (continued). The method of steepest descent. Waves in linear dispersive media. The asymptotic representation of the reflected wave in the problem of a spherical wave impinging on a plane interface. The lateral wave. The method of steepest descent; an extension to the case when some pole is located near the saddle. The asymptotic representation of Hankel's functions of large order. An asymptotic representation of Legendre's functions of large order. The asymptotic representation of Hankel's functions of large order (continued). — *Scattering matrix theory*: Introduction. The direct problem. The inverse problem. — *Flow in open channel*;

*asymptotic solution of some linear and nonlinear wave equation*: The kinematics and dynamics of flow in open channel. — The asymptotic representation of the solution of the wave equation. — Non linear wave theory. — *Seismic waves*: Waves in elastic solids. Plane waves. Reflexion and refraction of plane elastic waves. Waves of kind I, II, III. Analytic representations of  $P$  and  $S$  waves. The layered spherical model. The energy balance. The reflexion and transmission coefficients. The wave system in the layered spherical model. The  $P$ ,  $PcP$ ,  $PcS$ ,  $PKP$  waves produced by a point located outside the core. Application of the method of steepest descent to  $P$  and  $PcP$  wave integrals. The diffracted  $PcP$  wave. — *Some problems in water wave theory*: Oscillations in an infinite channel of variable depth. A diffraction problem.

**ISILC: Logic conference.** — Proceedings of the International Summer Institute and Logic Colloquium, Kiel 1974. — Edited by G. H. Müller, A. Oberschelp, and K. Potthoff. — Lecture Notes in Mathematics; vol. 499. — Un vol. broché, 16,5 × 24, de v, 651 p. — Prix: DM 49.00. — Springer Verlag, Berlin/Heidelberg/New York, 1975.

*Z. Adamowicz*: An observation on the product of Silver's forcing. — *E. Börger*: Recursively unsolvable algorithmic problems and related questions reexamined. — *W. Boos*: Lectures on large cardinal axioms. — *K. Devlin*: Indescribability properties and small large cardinals. — *K. Devlin & R. Jensen*: Marginalia to a theorem of Silver. — *J. Fenstad*: Computation theories: an axiomatic approach to recursion on general structures. — *R. Fittler*: Closed models and hulls of theories. — *T. Flanagan*: Axioms of choice in Morse-Kelley class theory. — *J. Flum*: First-order logic and its extensions. — *K. Gloede*: Set theory in infinitary languages. — *C. Imbert*: Sur la méthode en histoire de la logique. — *S. Kochen*: The model theory of local fields. — *P. Krauss*: Quantifier elimination. — *F.v. Kutschera*: Intensional semantics for natural languages. — *W. Marek & A. Mostowski*: On extendability of models of  $ZF$  set theory to the models of Kelley-Morse theory of classes. — *H. Rasiowa*: Many-valued algorithmic logic. — *W. Richter*: The least  $\Sigma_2^1$  and  $\pi_2^1$  reflecting ordinals. — *D. Scott*: Data types as lattices.

**L. E. J. Brouwer: Collected works. Vol. 2: Geometry, analysis, topology and mechanics.** Ed. by Hans Freudenthal. — Un vol. relié, 19,5 × 27, de xxvii, 706 p. — Prix: Dfl 250.00. — North Holland/American Elsevier, Amsterdam/Oxford/New York, 1976.

Preface. — The life of L. E. J. Brouwer. — Bibliography of L. E. J. Brouwer. — Non-euclidean spaces and integral theorems: 7 exposés. — Lie groups: 10 exposés. — Toward the plane translation theorem: 7 exposés — Vector fields on surfaces: 4 exposés. — Cantor-Schoenflies style topology: 13 exposés. — The new methods in topology: 33 exposés. Topology of surfaces: 11 exposés. — Mechanics: 3 exposés.

Oscar ZARISKI, Pierre SAMUEL. — **Commutative algebra, vol. 1.** — With the cooperation of I. S. Cohen. — Graduate texts in mathematics, vol. 28. — Un vol. relié, 16,5 × 24, de xi, 329 p. — Prix: DM 34.50. — Springer Verlag, New York/Heidelberg/Berlin, 1975. (Reprint of the 1958-1960 edition).

*Introductory concepts*: Binary operations. Groups. Subgroups. Abelian groups. Rings. Rings with identity. Powers and multiples. Fields. Subrings and subfields. Transformations and mappings. Group homomorphisms. Ring homomorphisms. Identification of rings. Unique factorization domains. Euclidean domains. Polynomials in one indeter-

minate. Polynomial rings. Polynomials in several indeterminates. Quotient fields and total quotient rings. Quotient rings with respect to multiplicative systems. Vector spaces. — *Elements of field theory*: Field extensions. Algebraic quantities. Algebraic extensions. The characteristic of a field. Separable and inseparable algebraic extensions. Splitting fields and normal extensions. The fundamental theorem of Galois theory. Galois fields. The theorem of the primitive element. Field polynomials. Norms and traces. The discriminant. Transcendental extensions. Separably generated fields of algebraic functions. Algebraically closed fields. Linear disjointness and separability. Order of inseparability of a field of algebraic functions. Derivations. — *Ideals and modules*: Ideals and modules. Operations on submodules. Operator homomorphisms and difference modules. The isomorphism theorems. Ring homomorphisms and residue class rings. The order of a subset of a module. Operations on ideals. Prime and maximal ideals. Primary ideals. Finiteness conditions. Composition series. Direct sums. Infinite direct sums. Comaximal ideals and direct sums of ideals. Tensor products of rings. Free joins of integral domains (or of fields). — *Noetherian rings*: Definitions. The Hilbert basis theorem. Rings with descending chain condition. Primary rings. Alternative method for studying the rings with d.c.c. The Lasker-Noether decomposition theorem. Uniqueness theorems. Application to zero-divisors and nilpotent elements. Application to the intersection of the powers of an ideal. Extended and contracted ideals. Quotient rings. Relations between ideals in  $R$  and ideals in  $R_m$ . Examples and applications of quotient rings. Symbolic powers. Length of an ideal. Prime ideals in noetherian rings. Principal ideal rings. Irreducible ideals. Appendix: Primary representation in noetherian modules. — *Dedekind domains. Classical ideal theory*: Integral elements. Integrally dependent rings. Integrally closed rings. Finiteness theorems. The conductor of an integral closure. Characterizations of Dedekind domains. Further properties of Dedekind domains. Extensions of Dedekind domains. Decomposition of prime ideals in extensions of Dedekind domains. Decomposition group, inertia group, and ramification groups. Different and discriminant. Application to quadratic fields and cyclotomic fields. A theorem of Kummer.

HENRI LEBESGUE. — **Leçons sur les séries trigonométriques.** — Un vol. broché,  $16 \times 24$ , de 128 p. — Prix: FF 28.00. — Librairie scientifique et technique, Albert Blanchard, Paris, 1975. (Nouveau tirage).

Propriétés des fonctions. — Détermination des coefficients des séries trigonométriques représentant une fonction donnée. — Théorie élémentaire des séries de Fourier. — Séries de Fourier convergentes. — Séries de Fourier quelconques. — Séries trigonométriques quelconques.