

MSC2010: Final Public Version [Oct. 2009]

MSC2010

This document is a printed form the Final Public Version of MSC2010 produced jointly by the editorial staffs of Mathematical Reviews (MR) and Zentralblatt für Mathematik (Zbl) in consultation with the mathematical community. The goals of this revision of the Mathematics Subject Classification (MSC) were set out in the announcement of it and call for comments by the Executive Editor of MR and the Chief Editor of Zbl in August 2006. This document results from the MSC revision process that has been going on since then. MSC2010 will be fully deployed from July 2010.

The editors of MR and Zbl deploying this revision therefore ask for feedback on remaining errors to help in this work, which should be given, preferably, on the Web site at <http://msc2010.org> or, if the internet is not available, through e-mail to feedback@msc2010.org. They are grateful for the many suggestions that were received previously which have much influenced what we have.

How to use the Mathematics Subject Classification [MSC]

The main purpose of the classification of items in the mathematical literature using the Mathematics Subject Classification scheme is to help users find the items of present or potential interest to them as readily as possible—in products derived from the Mathematical Reviews Database (MRDB), in Zentralblatt MATH (ZMATH), or anywhere else where this classification scheme is used. An item in the mathematical literature should be classified so as to attract the attention of all those possibly interested in it. The item may be something which falls squarely within one clear area of the MSC, or it may involve several areas. Ideally, the MSC codes attached to an item should represent the subjects to which the item contains a contribution. The classification should serve both those closely concerned with specific subject areas, and those familiar enough with subjects to apply their results and methods elsewhere, inside or outside of mathematics. It will be extremely useful

for both users and classifiers to familiarize themselves with the entire classification system and thus to become aware of all the classifications of possible interest to them.

Every item in the MRDB or ZMATH receives precisely one *primary* classification, which is simply the MSC code that describes its principal contribution. When an item contains several principal contributions to different areas, the primary classification should cover the most important among them. A paper or book may be assigned one or several secondary classification numbers to cover any remaining principal contributions, ancillary results, motivation or origin of the matters discussed, intended or potential field of application, or other significant aspects worthy of notice.

The principal contribution is meant to be the one including the most important part of the work actually done in the item. For example, a paper whose main overall content is the solution of a problem in graph theory, which arose in computer science and whose solution is (perhaps) at present only of interest to computer scientists, would have a primary classification in 05C (Graph Theory) with one or more secondary classifications in 68 (Computer Science); conversely, a paper whose overall content lies mainly in computer science should receive a primary classification in 68, even if it makes heavy use of graph theory and proves several new graph-theoretic results along the way.

There are two types of cross-references given at the end of many of the entries in the MSC. The first type is in braces: “{For A, see X}”; if this appears in section Y, it means that contributions described by A should usually be assigned the classification code X, not Y. The other type of cross-reference merely points out related classifications; it is in brackets: “[See also ...]”, “[See mainly ...]”, etc., and the classification codes listed in the brackets may, but need not, be included in the classification codes of a paper, or they may be used in place of the classification where the cross-reference is given. The classifier must judge which classification is the most appropriate for the paper at hand.

00–XX GENERAL

00–01	Instructional exposition (textbooks, tutorial papers, etc.)
00–02	Research exposition (monographs, survey articles)
00Axx	General and miscellaneous specific topics
00A05	General mathematics
00A06	Mathematics for nonmathematicians (engineering, social sciences, etc.)
00A07	Problem books
00A08	Recreational mathematics [See also 97A20]
00A09	Popularization of mathematics
00A15	Bibliographies
00A17	External book reviews
00A20	Dictionaries and other general reference works
00A22	Formularies
00A30	Philosophy of mathematics [See also 03A05]
00A35	Methodology of mathematics, didactics [See also 97Cxx , 97Dxx]
00A65	Mathematics and music
00A66	Mathematics and visual arts, visualization
00A67	Mathematics and architecture
00A69	General applied mathematics {For physics, see 00A79 and Sections 70 through 86}
00A71	Theory of mathematical modeling
00A72	General methods of simulation
00A73	Dimensional analysis
00A79	Physics (use more specific entries from Sections 70 through 86 when possible)
00A99	Miscellaneous topics
00Bxx	Conference proceedings and collections of papers
00B05	Collections of abstracts of lectures
00B10	Collections of articles of general interest
00B15	Collections of articles of miscellaneous specific content
00B20	Proceedings of conferences of general interest
00B25	Proceedings of conferences of miscellaneous specific interest
00B30	Festschriften
00B50	Volumes of selected translations
00B55	Miscellaneous volumes of translations
00B60	Collections of reprinted articles [See also 01A75]
00B99	None of the above, but in this section

01–XX HISTORY AND BIOGRAPHY [See also the classification number–03 in the other sections]

01–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
01–01	Instructional exposition (textbooks, tutorial papers, etc.)

01–02	Research exposition (monographs, survey articles)
01–06	Proceedings, conferences, collections, etc.
01–08	Computational methods
01Axx	History of mathematics and mathematicians
01A05	General histories, source books
01A07	Ethnomathematics, general
01A10	Paleolithic, Neolithic
01A12	Indigenous cultures of the Americas
01A13	Other indigenous cultures (non-European)
01A15	Indigenous European cultures (pre-Greek, etc.)
01A16	Egyptian
01A17	Babylonian
01A20	Greek, Roman
01A25	China
01A27	Japan
01A29	Southeast Asia
01A30	Islam (Medieval)
01A32	India
01A35	Medieval
01A40	15th and 16th centuries, Renaissance
01A45	17th century
01A50	18th century
01A55	19th century
01A60	20th century
01A61	Twenty-first century
01A65	Contemporary
01A67	Future prospectives
01A70	Biographies, obituaries, personalia, bibliographies
01A72	Schools of mathematics
01A73	Universities
01A74	Other institutions and academies
01A75	Collected or selected works; reprintings or translations of classics [See also 00B60]
01A80	Sociology (and profession) of mathematics
01A85	Historiography
01A90	Bibliographic studies
01A99	Miscellaneous topics

03–XX MATHEMATICAL LOGIC AND FOUNDATIONS

03–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
03–01	Instructional exposition (textbooks, tutorial papers, etc.)
03–02	Research exposition (monographs, survey articles)
03–03	Historical (must also be assigned at least one classification number from Section 01)

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03–04	Explicit machine computation and programs (not the theory of computation or programming)	03D30	Other degrees and reducibilities
03–06	Proceedings, conferences, collections, etc.	03D32	Algorithmic randomness and dimension [See also 68Q30]
03Axx	Philosophical aspects of logic and foundations	03D35	Undecidability and degrees of sets of sentences
03A05	Philosophical and critical {For philosophy of mathematics, see also 00A30 }	03D40	Word problems, etc. [See also 06B25 , 08A50 , 20F10 , 68R15]
03A10	Logic in the philosophy of science	03D45	Theory of numerations, effectively presented structures [See also 03C57 ; for intuitionistic and similar approaches see 03F55]
03A99	None of the above, but in this section	03D50	Recursive equivalence types of sets and structures, isols
03Bxx	General logic	03D55	Hierarchies
03B05	Classical propositional logic	03D60	Computability and recursion theory on ordinals, admissible sets, etc.
03B10	Classical first-order logic	03D65	Higher-type and set recursion theory
03B15	Higher-order logic and type theory	03D70	Inductive definability
03B20	Subsystems of classical logic (including intuitionistic logic)	03D75	Abstract and axiomatic computability and recursion theory
03B22	Abstract deductive systems	03D78	Computation over the reals {For constructive aspects, see 03F60 }
03B25	Decidability of theories and sets of sentences [See also 11U05 , 12L05 , 20F10]	03D80	Applications of computability and recursion theory
03B30	Foundations of classical theories (including reverse mathematics) [See also 03F35]	03D99	None of the above, but in this section
03B35	Mechanization of proofs and logical operations [See also 68T15]	03Exx	Set theory
03B40	Combinatory logic and lambda-calculus [See also 68N18]	03E02	Partition relations
03B42	Logics of knowledge and belief (including belief change)	03E04	Ordered sets and their cofinalities; pcf theory
03B44	Temporal logic	03E05	Other combinatorial set theory
03B45	Modal logic (including the logic of norms) {For knowledge and belief, see 03B42 ; for temporal logic, see 03B44 ; for provability logic, see also 03F45 }	03E10	Ordinal and cardinal numbers
03B47	Substructural logics (including relevance, entailment, linear logic, Lambek calculus, BCK and BCI logics) {For proof-theoretic aspects see 03F52 }	03E15	Descriptive set theory [See also 28A05 , 54H05]
03B48	Probability and inductive logic [See also 60A05]	03E17	Cardinal characteristics of the continuum
03B50	Many-valued logic	03E20	Other classical set theory (including functions, relations, and set algebra)
03B52	Fuzzy logic; logic of vagueness [See also 68T27 , 68T37 , 94D05]	03E25	Axiom of choice and related propositions
03B53	Paraconsistent logics	03E30	Axiomatics of classical set theory and its fragments
03B55	Intermediate logics	03E35	Consistency and independence results
03B60	Other nonclassical logic	03E40	Other aspects of forcing and Boolean-valued models
03B62	Combined logics	03E45	Inner models, including constructibility, ordinal definability, and core models
03B65	Logic of natural languages [See also 68T50 , 91F20]	03E47	Other notions of set-theoretic definability
03B70	Logic in computer science [See also 68–XX]	03E50	Continuum hypothesis and Martin’s axiom [See also 03E57]
03B80	Other applications of logic	03E55	Large cardinals
03B99	None of the above, but in this section	03E57	Generic absoluteness and forcing axioms [See also 03E50]
03Cxx	Model theory	03E60	Determinacy principles
03C05	Equational classes, universal algebra [See also 08Axx , 08Bxx , 18C05]	03E65	Other hypotheses and axioms
03C07	Basic properties of first-order languages and structures	03E70	Nonclassical and second-order set theories
03C10	Quantifier elimination, model completeness and related topics	03E72	Fuzzy set theory
03C13	Finite structures [See also 68Q15 , 68Q19]	03E75	Applications of set theory
03C15	Denumerable structures	03E99	None of the above, but in this section
03C20	Ultraproducts and related constructions	03Fxx	Proof theory and constructive mathematics
03C25	Model-theoretic forcing	03F03	Proof theory, general
03C30	Other model constructions	03F05	Cut-elimination and normal-form theorems
03C35	Categoricity and completeness of theories	03F07	Structure of proofs
03C40	Interpolation, preservation, definability	03F10	Functionals in proof theory
03C45	Classification theory, stability and related concepts [See also 03C48]	03F15	Recursive ordinals and ordinal notations
03C48	Abstract elementary classes and related topics [See also 03C45]	03F20	Complexity of proofs
03C50	Models with special properties (saturated, rigid, etc.)	03F25	Relative consistency and interpretations
03C52	Properties of classes of models	03F30	First-order arithmetic and fragments
03C55	Set-theoretic model theory	03F35	Second- and higher-order arithmetic and fragments [See also 03B30]
03C57	Effective and recursion-theoretic model theory [See also 03D45]	03F40	Gödel numberings and issues of incompleteness
03C60	Model-theoretic algebra [See also 08C10 , 12Lxx , 13L05]	03F45	Provability logics and related algebras (e.g., diagonalizable algebras) [See also 03B45 , 03G25 , 06E25]
03C62	Models of arithmetic and set theory [See also 03Hxx]	03F50	Metamathematics of constructive systems
03C64	Model theory of ordered structures; o-minimality	03F52	Linear logic and other substructural logics [See also 03B47]
03C65	Models of other mathematical theories	03F55	Intuitionistic mathematics
03C68	Other classical first-order model theory	03F60	Constructive and recursive analysis [See also 03B30 , 03D45 , 03D78 , 26E40 , 46S30 , 47S30]
03C70	Logic on admissible sets	03F65	Other constructive mathematics [See also 03D45]
03C75	Other infinitary logic	03F99	None of the above, but in this section
03C80	Logic with extra quantifiers and operators [See also 03B42 , 03B44 , 03B45 , 03B48]	03Gxx	Algebraic logic
03C85	Second- and higher-order model theory	03G05	Boolean algebras [See also 06Exx]
03C90	Nonclassical models (Boolean-valued, sheaf, etc.)	03G10	Lattices and related structures [See also 06Bxx]
03C95	Abstract model theory	03G12	Quantum logic [See also 06C15 , 81P10]
03C98	Applications of model theory [See also 03C60]	03G15	Cylindric and polyadic algebras; relation algebras
03C99	None of the above, but in this section	03G20	Lukasiewicz and Post algebras [See also 06D25 , 06D30]
03Dxx	Computability and recursion theory	03G25	Other algebras related to logic [See also 03F45 , 06D20 , 06E25 , 06F35]
03D03	Thue and Post systems, etc.	03G27	Abstract algebraic logic
03D05	Automata and formal grammars in connection with logical questions [See also 68Q45 , 68Q70 , 68R15]	03G30	Categorical logic, topoi [See also 18B25 , 18C05 , 18C10]
03D10	Turing machines and related notions [See also 68Q05]	03G99	None of the above, but in this section
03D15	Complexity of computation (including implicit computational complexity) [See also 68Q15 , 68Q17]	03Hxx	Nonstandard models [See also 03C62]
03D20	Recursive functions and relations, subrecursive hierarchies	03H05	Nonstandard models in mathematics [See also 26E35 , 28E05 , 30G06 , 46S20 , 47S20 , 54J05]
03D25	Recursively (computably) enumerable sets and degrees	03H10	Other applications of nonstandard models (economics, physics, etc.)
03D28	Other Turing degree structures	03H15	Nonstandard models of arithmetic [See also 11U10 , 12L15 , 13L05]
		03H99	None of the above, but in this section

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05–XX	COMBINATORICS {For finite fields, see 11Txx}	05C83	Graph minors
05–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	05C85	Graph algorithms [See also 68R10, 68W05]
05–01	Instructional exposition (textbooks, tutorial papers, etc.)	05C90	Applications [See also 68R10, 81Q30, 81T15, 82B20, 82C20, 90C35, 92E10, 94C15]
05–02	Research exposition (monographs, survey articles)	05C99	None of the above, but in this section
05–03	Historical (must also be assigned at least one classification number from Section 01)	05Dxx	Extremal combinatorics
05–04	Explicit machine computation and programs (not the theory of computation or programming)	05D05	Extremal set theory
05–06	Proceedings, conferences, collections, etc.	05D10	Ramsey theory [See also 05C55]
05Axx	Enumerative combinatorics {For enumeration in graph theory, see 05C30}	05D15	Transversal (matching) theory
05A05	Permutations, words, matrices	05D40	Probabilistic methods
05A10	Factorials, binomial coefficients, combinatorial functions [See also 11B65, 33Cxx]	05D99	None of the above, but in this section
05A15	Exact enumeration problems, generating functions [See also 33Cxx, 33Dxx]	05Exx	Algebraic combinatorics
05A16	Asymptotic enumeration	05E05	Symmetric functions and generalizations
05A17	Partitions of integers [See also 11P81, 11P82, 11P83]	05E10	Combinatorial aspects of representation theory [See also 20C30]
05A18	Partitions of sets	05E15	Combinatorial aspects of groups and algebras [See also 14Nxx, 22E45, 33C80]
05A19	Combinatorial identities, bijective combinatorics	05E18	Group actions on combinatorial structures
05A20	Combinatorial inequalities	05E30	Association schemes, strongly regular graphs
05A30	q -calculus and related topics [See also 33Dxx]	05E40	Combinatorial aspects of commutative algebra
05A40	Umbral calculus	05E45	Combinatorial aspects of simplicial complexes
05A99	None of the above, but in this section	05E99	None of the above, but in this section
05Bxx	Designs and configurations {For applications of design theory, see 94C30}	06–XX	ORDER, LATTICES, ORDERED ALGEBRAIC STRUCTURES [See also 18B35]
05B05	Block designs [See also 51E05, 62K10]	06–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
05B07	Triple systems	06–01	Instructional exposition (textbooks, tutorial papers, etc.)
05B10	Difference sets (number-theoretic, group-theoretic, etc.) [See also 11B13]	06–02	Research exposition (monographs, survey articles)
05B15	Orthogonal arrays, Latin squares, Room squares	06–03	Historical (must also be assigned at least one classification number from Section 01)
05B20	Matrices (incidence, Hadamard, etc.)	06–04	Explicit machine computation and programs (not the theory of computation or programming)
05B25	Finite geometries [See also 51D20, 51Exx]	06–06	Proceedings, conferences, collections, etc.
05B30	Other designs, configurations [See also 51E30]	06Axx	Ordered sets
05B35	Matroids, geometric lattices [See also 52B40, 90C27]	06A05	Total order
05B40	Packing and covering [See also 11H31, 52C15, 52C17]	06A06	Partial order, general
05B45	Tessellation and tiling problems [See also 52C20, 52C22]	06A07	Combinatorics of partially ordered sets
05B50	Polyominoes	06A11	Algebraic aspects of posets
05B99	None of the above, but in this section	06A12	Semilattices [See also 20M10; for topological semilattices see 22A26]
05Cxx	Graph theory {For applications of graphs, see 68R10, 81Q30, 81T15, 82B20, 82C20, 90C35, 92E10, 94C15}	06A15	Galois correspondences, closure operators
05C05	Trees	06A75	Generalizations of ordered sets
05C07	Vertex degrees [See also 05E30]	06A99	None of the above, but in this section
05C10	Planar graphs; geometric and topological aspects of graph theory [See also 57M15, 57M25]	06Bxx	Lattices [See also 03G10]
05C12	Distance in graphs	06B05	Structure theory
05C15	Coloring of graphs and hypergraphs	06B10	Ideals, congruence relations
05C17	Perfect graphs	06B15	Representation theory
05C20	Directed graphs (digraphs), tournaments	06B20	Varieties of lattices
05C21	Flows in graphs	06B23	Complete lattices, completions
05C22	Signed and weighted graphs	06B25	Free lattices, projective lattices, word problems [See also 03D40, 08A50, 20F10]
05C25	Graphs and abstract algebra (groups, rings, fields, etc.) [See also 20F65]	06B30	Topological lattices, order topologies [See also 06F30, 22A26, 54F05, 54H12]
05C30	Enumeration in graph theory	06B35	Continuous lattices and posets, applications [See also 06B30, 06D10, 06F30, 18B35, 22A26, 68Q55]
05C31	Graph polynomials	06B75	Generalizations of lattices
05C35	Extremal problems [See also 90C35]	06B99	None of the above, but in this section
05C38	Paths and cycles [See also 90B10]	06Cxx	Modular lattices, complemented lattices
05C40	Connectivity	06C05	Modular lattices, Desarguesian lattices
05C42	Density (toughness, etc.)	06C10	Semimodular lattices, geometric lattices
05C45	Eulerian and Hamiltonian graphs	06C15	Complemented lattices, orthocomplemented lattices and posets [See also 03G12, 81P10]
05C50	Graphs and linear algebra (matrices, eigenvalues, etc.)	06C20	Complemented modular lattices, continuous geometries
05C51	Graph designs and isomomorphic decomposition [See also 05B30]	06C99	None of the above, but in this section
05C55	Generalized Ramsey theory [See also 05D10]	06Dxx	Distributive lattices
05C57	Games on graphs [See also 91A43, 91A46]	06D05	Structure and representation theory
05C60	Isomorphism problems (reconstruction conjecture, etc.) and homomorphisms (subgraph embedding, etc.)	06D10	Complete distributivity
05C62	Graph representations (geometric and intersection representations, etc.) For graph drawing, see also 68R10	06D15	Pseudocomplemented lattices
05C63	Infinite graphs	06D20	Heyting algebras [See also 03G25]
05C65	Hypergraphs	06D22	Frames, locales {For topological questions see 54–XX}
05C69	Dominating sets, independent sets, cliques	06D25	Post algebras [See also 03G20]
05C70	Factorization, matching, partitioning, covering and packing	06D30	De Morgan algebras, Łukasiewicz algebras [See also 03G20]
05C72	Fractional graph theory, fuzzy graph theory	06D35	MV-algebras
05C75	Structural characterization of families of graphs	06D50	Lattices and duality
05C76	Graph operations (line graphs, products, etc.)	06D72	Fuzzy lattices (soft algebras) and related topics
05C78	Graph labelling (graceful graphs, bandwidth, etc.)	06D75	Other generalizations of distributive lattices
05C80	Random graphs [See also 60B20]	06D99	None of the above, but in this section
05C81	Random walks on graphs	06Exx	Boolean algebras (Boolean rings) [See also 03G05]
05C82	Small world graphs, complex networks [See also 90Bxx, 91D30]	06E05	Structure theory
		06E10	Chain conditions, complete algebras
		06E15	Stone spaces (Boolean spaces) and related structures
		06E20	Ring-theoretic properties [See also 16E50, 16G30]

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06E25	Boolean algebras with additional operations (diagonalizable algebras, etc.) [See also 03G25 , 03F45]	11A51	Factorization; primality
06E30	Boolean functions [See also 94C10]	11A55	Continued fractions {For approximation results, see 11J70 } [See also 11K50 , 30B70 , 40A15]
06E75	Generalizations of Boolean algebras	11A63	Radix representation; digital problems {For metric results, see 11K16 }
06E99	None of the above, but in this section	11A67	Other representations
06Fxx	Ordered structures	11A99	None of the above, but in this section
06F05	Ordered semigroups and monoids [See also 20Mxx]	11Bxx	Sequences and sets
06F07	Quantales	11B05	Density, gaps, topology
06F10	Noether lattices	11B13	Additive bases, including sumsets [See also 05B10]
06F15	Ordered groups [See also 20F60]	11B25	Arithmetic progressions [See also 11N13]
06F20	Ordered abelian groups, Riesz groups, ordered linear spaces [See also 46A40]	11B30	Arithmetic combinatorics; higher degree uniformity
06F25	Ordered rings, algebras, modules {For ordered fields, see 12J15 ; see also 13J25 , 16W80 }	11B34	Representation functions
06F30	Topological lattices, order topologies [See also 06B30 , 22A26 , 54F05 , 54H12]	11B37	Recurrences {For applications to special functions, see 33-XX }
06F35	BCK-algebras, BCI-algebras [See also 03G25]	11B39	Fibonacci and Lucas numbers and polynomials and generalizations
06F99	None of the above, but in this section	11B50	Sequences (mod m)
08-XX	GENERAL ALGEBRAIC SYSTEMS	11B57	Farey sequences; the sequences $1^k, 2^k, \dots$
08-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	11B65	Binomial coefficients; factorials; q -identities [See also 05A10 , 05A30]
08-01	Instructional exposition (textbooks, tutorial papers, etc.)	11B68	Bernoulli and Euler numbers and polynomials
08-02	Research exposition (monographs, survey articles)	11B73	Bell and Stirling numbers
08-03	Historical (must also be assigned at least one classification number from Section 01)	11B75	Other combinatorial number theory
08-04	Explicit machine computation and programs (not the theory of computation or programming)	11B83	Special sequences and polynomials
08-06	Proceedings, conferences, collections, etc.	11B85	Automata sequences
08Axx	Algebraic structures [See also 03C05]	11B99	None of the above, but in this section
08A02	Relational systems, laws of composition	11Cxx	Polynomials and matrices
08A05	Structure theory	11C08	Polynomials [See also 13F20]
08A30	Subalgebras, congruence relations	11C20	Matrices, determinants [See also 15B36]
08A35	Automorphisms, endomorphisms	11C99	None of the above, but in this section
08A40	Operations, polynomials, primal algebras	11Dxx	Diophantine equations [See also 11Gxx, 14Gxx]
08A45	Equational compactness	11D04	Linear equations
08A50	Word problems [See also 03D40 , 06B25 , 20F10 , 68R15]	11D07	The Frobenius problem
08A55	Partial algebras	11D09	Quadratic and bilinear equations
08A60	Unary algebras	11D25	Cubic and quartic equations
08A62	Finitary algebras	11D41	Higher degree equations; Fermat's equation
08A65	Infinitary algebras	11D45	Counting solutions of Diophantine equations
08A68	Heterogeneous algebras	11D57	Multiplicative and norm form equations
08A70	Applications of universal algebra in computer science	11D59	Thue-Mahler equations
08A72	Fuzzy algebraic structures	11D61	Exponential equations
08A99	None of the above, but in this section	11D68	Rational numbers as sums of fractions
08Bxx	Varieties [See also 03C05]	11D72	Equations in many variables [See also 11P55]
08B05	Equational logic, Mal'cev (Mal'tsev) conditions	11D75	Diophantine inequalities [See also 11J25]
08B10	Congruence modularity, congruence distributivity	11D79	Congruences in many variables
08B15	Lattices of varieties	11D85	Representation problems [See also 11P55]
08B20	Free algebras	11D88	p -adic and power series fields
08B25	Products, amalgamated products, and other kinds of limits and colimits [See also 18A30]	11D99	None of the above, but in this section
08B26	Subdirect products and subdirect irreducibility	11Exx	Forms and linear algebraic groups [See also 19Gxx] {For quadratic forms in linear algebra, see 15A63}
08B30	Injectives, projectives	11E04	Quadratic forms over general fields
08B99	None of the above, but in this section	11E08	Quadratic forms over local rings and fields
08Cxx	Other classes of algebras	11E10	Forms over real fields
08C05	Categories of algebras [See also 18C05]	11E12	Quadratic forms over global rings and fields
08C10	Axiomatic model classes [See also 03Cxx , in particular 03C60]	11E16	General binary quadratic forms
08C15	Quasivarieties	11E20	General ternary and quaternary quadratic forms; forms of more than two variables
08C20	Natural dualities for classes of algebras [See also 06E15 , 18A40 , 22A30]	11E25	Sums of squares and representations by other particular quadratic forms
08C99	None of the above, but in this section	11E39	Bilinear and Hermitian forms
11-XX	NUMBER THEORY	11E41	Class numbers of quadratic and Hermitian forms
11-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	11E45	Analytic theory (Epstein zeta functions; relations with automorphic forms and functions)
11-01	Instructional exposition (textbooks, tutorial papers, etc.)	11E57	Classical groups [See also 14Lxx , 20Gxx]
11-02	Research exposition (monographs, survey articles)	11E70	K -theory of quadratic and Hermitian forms
11-03	Historical (must also be assigned at least one classification number from Section 01)	11E72	Galois cohomology of linear algebraic groups [See also 20G10]
11-04	Explicit machine computation and programs (not the theory of computation or programming)	11E76	Forms of degree higher than two
11-06	Proceedings, conferences, collections, etc.	11E81	Algebraic theory of quadratic forms; Witt groups and rings [See also 19G12 , 19G24]
11Axx	Elementary number theory {For analogues in number fields, see 11R04}	11E88	Quadratic spaces; Clifford algebras [See also 15A63 , 15A66]
11A05	Multiplicative structure; Euclidean algorithm; greatest common divisors	11E95	p -adic theory
11A07	Congruences; primitive roots; residue systems	11E99	None of the above, but in this section
11A15	Power residues, reciprocity	11Fxx	Discontinuous groups and automorphic forms [See also 11R39, 11S37, 14Gxx, 14Kxx, 22E50, 22E55, 30F35, 32Nxx] {For relations with quadratic forms, see 11E45}
11A25	Arithmetic functions; related numbers; inversion formulas	11F03	Modular and automorphic functions
11A41	Primes	11F06	Structure of modular groups and generalizations; arithmetic groups [See also 20H05 , 20H10 , 22E40]
		11F11	Holomorphic modular forms of integral weight
		11F12	Automorphic forms, one variable
		11F20	Dedekind eta function, Dedekind sums
		11F22	Relationship to Lie algebras and finite simple groups
		11F23	Relations with algebraic geometry and topology

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11F25	Hecke-Petersson operators, differential operators (one variable)	11J83	Metric theory
11F27	Theta series; Weil representation; theta correspondences	11J85	Algebraic independence; Gel'fond's method
11F30	Fourier coefficients of automorphic forms	11J86	Linear forms in logarithms; Baker's method
11F32	Modular correspondences, etc.	11J87	Schmidt Subspace Theorem and applications
11F33	Congruences for modular and p -adic modular forms [See also 14G20 , 22E50]	11J89	Transcendence theory of elliptic and abelian functions
11F37	Forms of half-integer weight; nonholomorphic modular forms	11J91	Transcendence theory of other special functions
11F41	Automorphic forms on $GL(2)$; Hilbert and Hilbert-Siegel modular groups and their modular and automorphic forms; Hilbert modular surfaces [See also 14J20]	11J93	Transcendence theory of Drinfel'd and t -modules
11F46	Siegel modular groups; Siegel and Hilbert-Siegel modular and automorphic forms	11J95	Results involving abelian varieties
11F50	Jacobi forms	11J97	Analogues of methods in Nevanlinna theory (work of Vojta et al.)
11F52	Modular forms associated to Drinfel'd modules	11J99	None of the above, but in this section
11F55	Other groups and their modular and automorphic forms (several variables)	11Kxx	Probabilistic theory: distribution modulo 1; metric theory of algorithms
11F60	Hecke-Petersson operators, differential operators (several variables)	11K06	General theory of distribution modulo 1 [See also 11J71]
11F66	Langlands L -functions; one variable Dirichlet series and functional equations	11K16	Normal numbers, radix expansions, Pisot numbers, Salem numbers, good lattice points, etc. [See also 11A63]
11F67	Special values of automorphic L -series, periods of modular forms, cohomology, modular symbols	11K31	Special sequences
11F68	Dirichlet series in several complex variables associated to automorphic forms; Weyl group multiple Dirichlet series	11K36	Well-distributed sequences and other variations
11F70	Representation-theoretic methods; automorphic representations over local and global fields	11K38	Irregularities of distribution, discrepancy [See also 11Nxx]
11F72	Spectral theory; Selberg trace formula	11K41	Continuous, p -adic and abstract analogues
11F75	Cohomology of arithmetic groups	11K45	Pseudo-random numbers; Monte Carlo methods
11F80	Galois representations	11K50	Metric theory of continued fractions [See also 11A55 , 11J70]
11F85	p -adic theory, local fields [See also 14G20 , 22E50]	11K55	Metric theory of other algorithms and expansions; measure and Hausdorff dimension [See also 11N99 , 28Dxx]
11F99	None of the above, but in this section	11K60	Diophantine approximation [See also 11Jxx]
11Gxx	Arithmetic algebraic geometry (Diophantine geometry) [See also 11Dxx , 14Gxx , 14Kxx]	11K65	Arithmetic functions [See also 11Nxx]
11G05	Elliptic curves over global fields [See also 14H52]	11K70	Harmonic analysis and almost periodicity
11G07	Elliptic curves over local fields [See also 14G20 , 14H52]	11K99	None of the above, but in this section
11G09	Drinfel'd modules; higher-dimensional motives, etc. [See also 14L05]	11Lxx	Exponential sums and character sums {For finite fields, see 11Txx}
11G10	Abelian varieties of dimension > 1 [See also 14Kxx]	11L03	Trigonometric and exponential sums, general
11G15	Complex multiplication and moduli of abelian varieties [See also 14K22]	11L05	Gauss and Kloosterman sums; generalizations
11G16	Elliptic and modular units [See also 11R27]	11L07	Estimates on exponential sums
11G18	Arithmetic aspects of modular and Shimura varieties [See also 14G35]	11L10	Jacobsthal and Brewer sums; other complete character sums
11G20	Curves over finite and local fields [See also 14H25]	11L15	Weyl sums
11G25	Varieties over finite and local fields [See also 14G15 , 14G20]	11L20	Sums over primes
11G30	Curves of arbitrary genus or genus $\neq 1$ over global fields [See also 14H25]	11L26	Sums over arbitrary intervals
11G32	Dessins d'enfants, Belyi theory	11L40	Estimates on character sums
11G35	Varieties over global fields [See also 14G25]	11L99	None of the above, but in this section
11G40	L -functions of varieties over global fields; Birch-Swinnerton-Dyer conjecture [See also 14G10]	11Mxx	Zeta and L-functions: analytic theory
11G42	Arithmetic mirror symmetry [See also 14J33]	11M06	$\zeta(s)$ and $L(s, \chi)$
11G45	Geometric class field theory [See also 11R37 , 14C35 , 19F05]	11M20	Real zeros of $L(s, \chi)$; results on $L(1, \chi)$
11G50	Heights [See also 14G40 , 37P30]	11M26	Nonreal zeros of $\zeta(s)$ and $L(s, \chi)$; Riemann and other hypotheses
11G55	Polylogarithms and relations with K -theory	11M32	Multiple Dirichlet series and zeta functions and multizeta values
11G99	None of the above, but in this section	11M35	Hurwitz and Lerch zeta functions
11Hxx	Geometry of numbers {For applications in coding theory, see 94B75}	11M36	Selberg zeta functions and regularized determinants; applications to spectral theory, Dirichlet series, Eisenstein series, etc. Explicit formulas
11H06	Lattices and convex bodies [See also 11P21 , 52C05 , 52C07]	11M38	Zeta and L -functions in characteristic p
11H16	Nonconvex bodies	11M41	Other Dirichlet series and zeta functions {For local and global ground fields, see 11R42 , 11R52 , 11S40 , 11S45 ; for algebro-geometric methods, see 14G10 ; see also 11E45 , 11F66 , 11F70 , 11F72 }
11H31	Lattice packing and covering [See also 05B40 , 52C15 , 52C17]	11M45	Tauberian theorems [See also 40E05]
11H46	Products of linear forms	11M50	Relations with random matrices
11H50	Minima of forms	11M55	Relations with noncommutative geometry
11H55	Quadratic forms (reduction theory, extreme forms, etc.)	11M99	None of the above, but in this section
11H56	Automorphism groups of lattices	11Nxx	Multiplicative number theory
11H60	Mean value and transfer theorems	11N05	Distribution of primes
11H71	Relations with coding theory	11N13	Primes in progressions [See also 11B25]
11H99	None of the above, but in this section	11N25	Distribution of integers with specified multiplicative constraints
11Jxx	Diophantine approximation, transcendental number theory [See also 11K60]	11N30	Turán theory [See also 30Bxx]
11J04	Homogeneous approximation to one number	11N32	Primes represented by polynomials; other multiplicative structure of polynomial values
11J06	Markov and Lagrange spectra and generalizations	11N35	Sieves
11J13	Simultaneous homogeneous approximation, linear forms	11N36	Applications of sieve methods
11J17	Approximation by numbers from a fixed field	11N37	Asymptotic results on arithmetic functions
11J20	Inhomogeneous linear forms	11N45	Asymptotic results on counting functions for algebraic and topological structures
11J25	Diophantine inequalities [See also 11D75]	11N56	Rate of growth of arithmetic functions
11J54	Small fractional parts of polynomials and generalizations	11N60	Distribution functions associated with additive and positive multiplicative functions
11J61	Approximation in non-Archimedean valuations	11N64	Other results on the distribution of values or the characterization of arithmetic functions
11J68	Approximation to algebraic numbers	11N69	Distribution of integers in special residue classes
11J70	Continued fractions and generalizations [See also 11A55 , 11K50]	11N75	Applications of automorphic functions and forms to multiplicative problems [See also 11Fxx]
11J71	Distribution modulo one [See also 11K06]	11N80	Generalized primes and integers
11J72	Irrationality; linear independence over a field	11N99	None of the above, but in this section
11J81	Transcendence (general theory)	11Pxx	Additive number theory; partitions
11J82	Measures of irrationality and of transcendence	11P05	Waring's problem and variants
		11P21	Lattice points in specified regions
		11P32	Goldbach-type theorems; other additive questions involving primes

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11P55 Applications of the Hardy-Littlewood method [See also [11D85](#)]
 11P70 Inverse problems of additive number theory, including sumsets
 11P81 Elementary theory of partitions [See also [05A17](#)]
 11P82 Analytic theory of partitions
 11P83 Partitions; congruences and congruential restrictions
 11P84 Partition identities; identities of Rogers-Ramanujan type
 11P99 None of the above, but in this section
11Rxx Algebraic number theory: global fields {For complex multiplication, see [11G15](#)}
 11R04 Algebraic numbers; rings of algebraic integers
 11R06 PV-numbers and generalizations; other special algebraic numbers; Mahler measure
 11R09 Polynomials (irreducibility, etc.)
 11R11 Quadratic extensions
 11R16 Cubic and quartic extensions
 11R18 Cyclotomic extensions
 11R20 Other abelian and metabelian extensions
 11R21 Other number fields
 11R23 Iwasawa theory
 11R27 Units and factorization
 11R29 Class numbers, class groups, discriminants
 11R32 Galois theory
 11R33 Integral representations related to algebraic numbers; Galois module structure of rings of integers [See also [20C10](#)]
 11R34 Galois cohomology [See also [12Gxx](#), [19A31](#)]
 11R37 Class field theory
 11R39 Langlands-Weil conjectures, nonabelian class field theory [See also [11Fxx](#), [22E55](#)]
 11R42 Zeta functions and L -functions of number fields [See also [11M41](#), [19F27](#)]
 11R44 Distribution of prime ideals [See also [11N05](#)]
 11R45 Density theorems
 11R47 Other analytic theory [See also [11Nxx](#)]
 11R52 Quaternion and other division algebras: arithmetic, zeta functions
 11R54 Other algebras and orders, and their zeta and L -functions [See also [11S45](#), [16Hxx](#), [16Kxx](#)]
 11R56 Adèle rings and groups
 11R58 Arithmetic theory of algebraic function fields [See also [14-XX](#)]
 11R60 Cyclotomic function fields (class groups, Bernoulli objects, etc.)
 11R65 Class groups and Picard groups of orders
 11R70 K -theory of global fields [See also [19Fxx](#)]
 11R80 Totally real fields [See also [12J15](#)]
 11R99 None of the above, but in this section
11Sxx Algebraic number theory: local and p -adic fields
 11S05 Polynomials
 11S15 Ramification and extension theory
 11S20 Galois theory
 11S23 Integral representations
 11S25 Galois cohomology [See also [12Gxx](#), [16H05](#)]
 11S31 Class field theory; p -adic formal groups [See also [14L05](#)]
 11S37 Langlands-Weil conjectures, nonabelian class field theory [See also [11Fxx](#), [22E50](#)]
 11S40 Zeta functions and L -functions [See also [11M41](#), [19F27](#)]
 11S45 Algebras and orders, and their zeta functions [See also [11R52](#), [11R54](#), [16Hxx](#), [16Kxx](#)]
 11S70 K -theory of local fields [See also [19Fxx](#)]
 11S80 Other analytic theory (analogues of beta and gamma functions, p -adic integration, etc.)
 11S82 Non-Archimedean dynamical systems [See mainly [37Pxx](#)]
 11S85 Other nonanalytic theory
 11S90 Prehomogeneous vector spaces
 11S99 None of the above, but in this section
11Txx Finite fields and commutative rings (number-theoretic aspects)
 11T06 Polynomials
 11T22 Cyclotomy
 11T23 Exponential sums
 11T24 Other character sums and Gauss sums
 11T30 Structure theory
 11T55 Arithmetic theory of polynomial rings over finite fields
 11T60 Finite upper half-planes
 11T71 Algebraic coding theory; cryptography
 11T99 None of the above, but in this section
11Uxx Connections with logic
 11U05 Decidability [See also [03B25](#)]
 11U07 Ultraproducts [See also [03C20](#)]
 11U09 Model theory [See also [03Cxx](#)]
 11U10 Nonstandard arithmetic [See also [03H15](#)]
 11U99 None of the above, but in this section

11Yxx Computational number theory [See also [11-04](#)]
 11Y05 Factorization
 11Y11 Primality
 11Y16 Algorithms; complexity [See also [68Q25](#)]
 11Y35 Analytic computations
 11Y40 Algebraic number theory computations
 11Y50 Computer solution of Diophantine equations
 11Y55 Calculation of integer sequences
 11Y60 Evaluation of constants
 11Y65 Continued fraction calculations
 11Y70 Values of arithmetic functions; tables
 11Y99 None of the above, but in this section
11Zxx Miscellaneous applications of number theory
 11Z05 Miscellaneous applications of number theory
 11Z99 None of the above, but in this section
12-XX FIELD THEORY AND POLYNOMIALS
 12-00 General reference works (handbooks, dictionaries, bibliographies, etc.)
 12-01 Instructional exposition (textbooks, tutorial papers, etc.)
 12-02 Research exposition (monographs, survey articles)
 12-03 Historical (must also be assigned at least one classification number from Section 01)
 12-04 Explicit machine computation and programs (not the theory of computation or programming)
 12-06 Proceedings, conferences, collections, etc.
12Dxx Real and complex fields
 12D05 Polynomials: factorization
 12D10 Polynomials: location of zeros (algebraic theorems) {For the analytic theory, see [26C10](#), [30C15](#)}
 12D15 Fields related with sums of squares (formally real fields, Pythagorean fields, etc.) [See also [11Exx](#)]
 12D99 None of the above, but in this section
12Exx General field theory
 12E05 Polynomials (irreducibility, etc.)
 12E10 Special polynomials
 12E12 Equations
 12E15 Skew fields, division rings [See also [11R52](#), [11R54](#), [11S45](#), [16Kxx](#)]
 12E20 Finite fields (field-theoretic aspects)
 12E25 Hilbertian fields; Hilbert's irreducibility theorem
 12E30 Field arithmetic
 12E99 None of the above, but in this section
12Fxx Field extensions
 12F05 Algebraic extensions
 12F10 Separable extensions, Galois theory
 12F12 Inverse Galois theory
 12F15 Inseparable extensions
 12F20 Transcendental extensions
 12F99 None of the above, but in this section
12Gxx Homological methods (field theory)
 12G05 Galois cohomology [See also [14F22](#), [16Hxx](#), [16K50](#)]
 12G10 Cohomological dimension
 12G99 None of the above, but in this section
12Hxx Differential and difference algebra
 12H05 Differential algebra [See also [13Nxx](#)]
 12H10 Difference algebra [See also [39Axx](#)]
 12H20 Abstract differential equations [See also [34Mxx](#)]
 12H25 p -adic differential equations [See also [11S80](#), [14G20](#)]
 12H99 None of the above, but in this section
12Jxx Topological fields
 12J05 Normed fields
 12J10 Valued fields
 12J12 Formally p -adic fields
 12J15 Ordered fields
 12J17 Topological semifields
 12J20 General valuation theory [See also [13A18](#)]
 12J25 Non-Archimedean valued fields [See also [30G06](#), [32P05](#), [46S10](#), [47S10](#)]
 12J27 Krasner-Tate algebras [See mainly [32P05](#); see also [46S10](#), [47S10](#)]
 12J99 None of the above, but in this section
12Kxx Generalizations of fields
 12K05 Near-fields [See also [16Y30](#)]
 12K10 Semifields [See also [16Y60](#)]
 12K99 None of the above, but in this section
12Lxx Connections with logic
 12L05 Decidability [See also [03B25](#)]
 12L10 Ultraproducts [See also [03C20](#)]
 12L12 Model theory [See also [03C60](#)]
 12L15 Nonstandard arithmetic [See also [03H15](#)]
 12L99 None of the above, but in this section

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12Yxx	Computational aspects of field theory and polynomials	13F15	Rings defined by factorization properties (e.g., atomic, factorial, half-factorial) [See also 13A05 , 14M05]
12Y05	Computational aspects of field theory and polynomials	13F20	Polynomial rings and ideals; rings of integer-valued polynomials [See also 11C08 , 13B25]
12Y99	None of the above, but in this section	13F25	Formal power series rings [See also 13J05]
13–XX	COMMUTATIVE ALGEBRA	13F30	Valuation rings [See also 13A18]
13–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	13F35	Witt vectors and related rings
13–01	Instructional exposition (textbooks, tutorial papers, etc.)	13F40	Excellent rings
13–02	Research exposition (monographs, survey articles)	13F45	Seminormal rings
13–03	Historical (must also be assigned at least one classification number from Section 01)	13F50	Rings with straightening laws, Hodge algebras
13–04	Explicit machine computation and programs (not the theory of computation or programming)	13F55	Stanley-Reisner face rings; simplicial complexes [See also 55U10]
13–06	Proceedings, conferences, collections, etc.	13F60	Cluster algebras
13Axx	General commutative ring theory	13F99	None of the above, but in this section
13A02	Graded rings [See also 16W50]	13Gxx	Integral domains
13A05	Divisibility; factorizations [See also 13F15]	13G05	Integral domains
13A15	Ideals; multiplicative ideal theory	13G99	None of the above, but in this section
13A18	Valuations and their generalizations [See also 12J20]	13Hxx	Local rings and semilocal rings
13A30	Associated graded rings of ideals (Rees ring, form ring), analytic spread and related topics	13H05	Regular local rings
13A35	Characteristic p methods (Frobenius endomorphism) and reduction to characteristic p ; tight closure [See also 13B22]	13H10	Special types (Cohen-Macaulay, Gorenstein, Buchsbaum, etc.) [See also 14M05]
13A50	Actions of groups on commutative rings; invariant theory [See also 14L24]	13H15	Multiplicity theory and related topics [See also 14C17]
13A99	None of the above, but in this section	13H99	None of the above, but in this section
13Bxx	Ring extensions and related topics	13Jxx	Topological rings and modules [See also 16W60 , 16W80]
13B02	Extension theory	13J05	Power series rings [See also 13F25]
13B05	Galois theory	13J07	Analytical algebras and rings [See also 32B05]
13B10	Morphisms	13J10	Complete rings, completion [See also 13B35]
13B21	Integral dependence; going up, going down	13J15	Henselian rings [See also 13B40]
13B22	Integral closure of rings and ideals [See also 13A35]; integrally closed rings, related rings (Japanese, etc.)	13J20	Global topological rings
13B25	Polynomials over commutative rings [See also 11C08 , 11T06 , 13F20 , 13M10]	13J25	Ordered rings [See also 06F25]
13B30	Rings of fractions and localization [See also 16S85]	13J30	Real algebra [See also 12D15 , 14Pxx]
13B35	Completion [See also 13J10]	13J99	None of the above, but in this section
13B40	Étale and flat extensions; Henselization; Artin approximation [See also 13J15 , 14B12 , 14B25]	13Lxx	Applications of logic to commutative algebra [See also 03Cxx , 03Hxx]
13B99	None of the above, but in this section	13L05	Applications of logic to commutative algebra [See also 03Cxx , 03Hxx]
13Cxx	Theory of modules and ideals	13L99	None of the above, but in this section
13C05	Structure, classification theorems	13Mxx	Finite commutative rings {For number-theoretic aspects, see 11Txx }
13C10	Projective and free modules and ideals [See also 19A13]	13M05	Structure
13C11	Injective and flat modules and ideals	13M10	Polynomials
13C12	Torsion modules and ideals	13M99	None of the above, but in this section
13C13	Other special types	13Nxx	Differential algebra [See also 12H05 , 14F10]
13C14	Cohen-Macaulay modules [See also 13H10]	13N05	Modules of differentials
13C15	Dimension theory, depth, related rings (catenary, etc.)	13N10	Rings of differential operators and their modules [See also 16S32 , 32C38]
13C20	Class groups [See also 11R29]	13N15	Derivations
13C40	Linkage, complete intersections and determinantal ideals [See also 14M06 , 14M10 , 14M12]	13N99	None of the above, but in this section
13C60	Module categories	13Pxx	Computational aspects and applications [See also 14Qxx , 68W30]
13C99	None of the above, but in this section	13P05	Polynomials, factorization [See also 12Y05]
13Dxx	Homological methods {For noncommutative rings, see 16Exx ; for general categories, see 18Gxx }	13P10	Gröbner bases; other bases for ideals and modules (e.g., Janet and border bases)
13D02	Syzygies, resolutions, complexes	13P15	Solving polynomial systems; resultants
13D03	(Co)homology of commutative rings and algebras (e.g., Hochschild, André-Quillen, cyclic, dihedral, etc.)	13P20	Computational homological algebra [See also 13Dxx]
13D05	Homological dimension	13P25	Applications of commutative algebra (e.g., to statistics, control theory, optimization, etc.)
13D07	Homological functors on modules (Tor, Ext, etc.)	13P99	None of the above, but in this section
13D09	Derived categories	14–XX	ALGEBRAIC GEOMETRY
13D10	Deformations and infinitesimal methods [See also 14B10 , 14B12 , 14D15 , 32Gxx]	14–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
13D15	Grothendieck groups, K -theory [See also 14C35 , 18F30 , 19Axx , 19D50]	14–01	Instructional exposition (textbooks, tutorial papers, etc.)
13D22	Homological conjectures (intersection theorems)	14–02	Research exposition (monographs, survey articles)
13D30	Torsion theory [See also 13C12 , 18E40]	14–03	Historical (must also be assigned at least one classification number from Section 01)
13D40	Hilbert-Samuel and Hilbert-Kunz functions; Poincaré series	14–04	Explicit machine computation and programs (not the theory of computation or programming)
13D45	Local cohomology [See also 14B15]	14–06	Proceedings, conferences, collections, etc.
13D99	None of the above, but in this section	14Axx	Foundations
13Exx	Chain conditions, finiteness conditions	14A05	Relevant commutative algebra [See also 13–XX]
13E05	Noetherian rings and modules	14A10	Varieties and morphisms
13E10	Artinian rings and modules, finite-dimensional algebras	14A15	Schemes and morphisms
13E15	Rings and modules of finite generation or presentation; number of generators	14A20	Generalizations (algebraic spaces, stacks)
13E99	None of the above, but in this section	14A22	Noncommutative algebraic geometry [See also 16S38]
13Fxx	Arithmetic rings and other special rings	14A25	Elementary questions
13F05	Dedekind, Prüfer, Krull and Mori rings and their generalizations	14A99	None of the above, but in this section
13F07	Euclidean rings and generalizations	14Bxx	Local theory
13F10	Principal ideal rings	14B05	Singularities [See also 14E15 , 14H20 , 14J17 , 32Sxx , 58Kxx]
		14B07	Deformations of singularities [See also 14D15 , 32S30]
		14B10	Infinitesimal methods [See also 13D10]
		14B12	Local deformation theory, Artin approximation, etc. [See also 13B40 , 13D10]
		14B15	Local cohomology [See also 13D45 , 32C36]
		14B20	Formal neighborhoods
		14B25	Local structure of morphisms: étale, flat, etc. [See also 13B40]

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- 14B99 None of the above, but in this section
- 14Cxx Cycles and subschemes**
- 14C05 Parametrization (Chow and Hilbert schemes)
- 14C15 (Equivariant) Chow groups and rings; motives
- 14C17 Intersection theory, characteristic classes, intersection multiplicities [See also [13H15](#)]
- 14C20 Divisors, linear systems, invertible sheaves
- 14C21 Pencils, nets, webs [See also [53A60](#)]
- 14C22 Picard groups
- 14C25 Algebraic cycles
- 14C30 Transcendental methods, Hodge theory [See also [14D07](#), [32G20](#), [32J25](#), [32S35](#)], Hodge conjecture
- 14C34 Torelli problem [See also [32G20](#)]
- 14C35 Applications of methods of algebraic K -theory [See also [19Exx](#)]
- 14C40 Riemann-Roch theorems [See also [19E20](#), [19L10](#)]
- 14C99 None of the above, but in this section
- 14Dxx Families, fibrations**
- 14D05 Structure of families (Picard-Lefschetz, monodromy, etc.)
- 14D06 Fibrations, degenerations
- 14D07 Variation of Hodge structures [See also [32G20](#)]
- 14D10 Arithmetic ground fields (finite, local, global)
- 14D15 Formal methods; deformations [See also [13D10](#), [14B07](#), [32Gxx](#)]
- 14D20 Algebraic moduli problems, moduli of vector bundles {For analytic moduli problems, see [32G13](#)}
- 14D21 Applications of vector bundles and moduli spaces in mathematical physics (twistor theory, instantons, quantum field theory) [See also [32L25](#), [81Txx](#)]
- 14D22 Fine and coarse moduli spaces
- 14D23 Stacks and moduli problems
- 14D24 Geometric Langlands program: algebro-geometric aspects [See also [22E57](#)]
- 14D99 None of the above, but in this section
- 14Exx Birational geometry**
- 14E05 Rational and birational maps
- 14E07 Birational automorphisms, Cremona group and generalizations
- 14E08 Rationality questions [See also [14M20](#)]
- 14E15 Global theory and resolution of singularities [See also [14B05](#), [32S20](#), [32S45](#)]
- 14E16 McKay correspondence
- 14E18 Arcs and motivic integration
- 14E20 Coverings [See also [14H30](#)]
- 14E22 Ramification problems [See also [11S15](#)]
- 14E25 Embeddings
- 14E30 Minimal model program (Mori theory, extremal rays)
- 14E99 None of the above, but in this section
- 14Fxx (Co)homology theory [See also [13Dxx](#)]**
- 14F05 Sheaves, derived categories of sheaves and related constructions [See also [14H60](#), [14J60](#), [18F20](#), [32Lxx](#), [46M20](#)]
- 14F10 Differentials and other special sheaves; D-modules; Bernstein-Sato ideals and polynomials [See also [13Nxx](#), [32C38](#)]
- 14F17 Vanishing theorems [See also [32L20](#)]
- 14F18 Multiplier ideals
- 14F20 Étale and other Grothendieck topologies and (co)homologies
- 14F22 Brauer groups of schemes [See also [12G05](#), [16K50](#)]
- 14F25 Classical real and complex (co)homology
- 14F30 p -adic cohomology, crystalline cohomology
- 14F35 Homotopy theory; fundamental groups [See also [14H30](#)]
- 14F40 de Rham cohomology [See also [14C30](#), [32C35](#), [32L10](#)]
- 14F42 Motivic cohomology; motivic homotopy theory [See also [19E15](#)]
- 14F43 Other algebro-geometric (co)homologies (e.g., intersection, equivariant, Lawson, Deligne (co)homologies)
- 14F45 Topological properties
- 14F99 None of the above, but in this section
- 14Gxx Arithmetic problems. Diophantine geometry [See also [11Dxx](#), [11Gxx](#)]**
- 14G05 Rational points
- 14G10 Zeta-functions and related questions [See also [11G40](#)] (Birch-Swinnerton-Dyer conjecture)
- 14G15 Finite ground fields
- 14G17 Positive characteristic ground fields
- 14G20 Local ground fields
- 14G22 Rigid analytic geometry
- 14G25 Global ground fields
- 14G27 Other nonalgebraically closed ground fields
- 14G32 Universal profinite groups (relationship to moduli spaces, projective and moduli towers, Galois theory)
- 14G35 Modular and Shimura varieties [See also [11F41](#), [11F46](#), [11G18](#)]
- 14G40 Arithmetic varieties and schemes; Arakelov theory; heights [See also [11G50](#), [37P30](#)]
- 14G50 Applications to coding theory and cryptography [See also [94A60](#), [94B27](#), [94B40](#)]
- 14G99 None of the above, but in this section
- 14Hxx Curves**
- 14H05 Algebraic functions; function fields [See also [11R58](#)]
- 14H10 Families, moduli (algebraic)
- 14H15 Families, moduli (analytic) [See also [30F10](#), [32G15](#)]
- 14H20 Singularities, local rings [See also [13Hxx](#), [14B05](#)]
- 14H25 Arithmetic ground fields [See also [11Dxx](#), [11G05](#), [14Gxx](#)]
- 14H30 Coverings, fundamental group [See also [14E20](#), [14F35](#)]
- 14H37 Automorphisms
- 14H40 Jacobians, Prym varieties [See also [32G20](#)]
- 14H42 Theta functions; Schottky problem [See also [14K25](#), [32G20](#)]
- 14H45 Special curves and curves of low genus
- 14H50 Plane and space curves
- 14H51 Special divisors (gonality, Brill-Noether theory)
- 14H52 Elliptic curves [See also [11G05](#), [11G07](#), [14Kxx](#)]
- 14H55 Riemann surfaces; Weierstrass points; gap sequences [See also [30Fxx](#)]
- 14H57 Dessins d'enfants theory {For arithmetic aspects, see [11G32](#)}
- 14H60 Vector bundles on curves and their moduli [See also [14D20](#), [14F05](#)]
- 14H70 Relationships with integrable systems
- 14H81 Relationships with physics
- 14H99 None of the above, but in this section
- 14Jxx Surfaces and higher-dimensional varieties {For analytic theory, see [32Jxx](#)}**
- 14J10 Families, moduli, classification: algebraic theory
- 14J15 Moduli, classification: analytic theory; relations with modular forms [See also [32G13](#)]
- 14J17 Singularities [See also [14B05](#), [14E15](#)]
- 14J20 Arithmetic ground fields [See also [11Dxx](#), [11G25](#), [11G35](#), [14Gxx](#)]
- 14J25 Special surfaces {For Hilbert modular surfaces, see [14G35](#)}
- 14J26 Rational and ruled surfaces
- 14J27 Elliptic surfaces
- 14J28 $K3$ surfaces and Enriques surfaces
- 14J29 Surfaces of general type
- 14J30 3-folds [See also [32Q25](#)]
- 14J32 Calabi-Yau manifolds
- 14J33 Mirror symmetry [See also [11G42](#), [53D37](#)]
- 14J35 4-folds
- 14J40 n -folds ($n > 4$)
- 14J45 Fano varieties
- 14J50 Automorphisms of surfaces and higher-dimensional varieties
- 14J60 Vector bundles on surfaces and higher-dimensional varieties, and their moduli [See also [14D20](#), [14F05](#), [32Lxx](#)]
- 14J70 Hypersurfaces
- 14J80 Topology of surfaces (Donaldson polynomials, Seiberg-Witten invariants)
- 14J81 Relationships with physics
- 14J99 None of the above, but in this section
- 14Kxx Abelian varieties and schemes**
- 14K02 Isogeny
- 14K05 Algebraic theory
- 14K10 Algebraic moduli, classification [See also [11G15](#)]
- 14K12 Subvarieties
- 14K15 Arithmetic ground fields [See also [11Dxx](#), [11Fxx](#), [11G10](#), [14Gxx](#)]
- 14K20 Analytic theory; abelian integrals and differentials
- 14K22 Complex multiplication [See also [11G15](#)]
- 14K25 Theta functions [See also [14H42](#)]
- 14K30 Picard schemes, higher Jacobians [See also [14H40](#), [32G20](#)]
- 14K99 None of the above, but in this section
- 14Lxx Algebraic groups {For linear algebraic groups, see [20Gxx](#); for Lie algebras, see [17B45](#)}**
- 14L05 Formal groups, p -divisible groups [See also [55N22](#)]
- 14L10 Group varieties
- 14L15 Group schemes
- 14L17 Affine algebraic groups, hyperalgebra constructions [See also [17B45](#), [18D35](#)]
- 14L24 Geometric invariant theory [See also [13A50](#)]
- 14L30 Group actions on varieties or schemes (quotients) [See also [13A50](#), [14L24](#), [14M17](#)]
- 14L35 Classical groups (geometric aspects) [See also [20Gxx](#), [51N30](#)]
- 14L40 Other algebraic groups (geometric aspects)
- 14L99 None of the above, but in this section
- 14Mxx Special varieties**
- 14M05 Varieties defined by ring conditions (factorial, Cohen-Macaulay, seminormal) [See also [13F15](#), [13F45](#), [13H10](#)]
- 14M06 Linkage [See also [13C40](#)]
- 14M07 Low codimension problems
- 14M10 Complete intersections [See also [13C40](#)]
- 14M12 Determinantal varieties [See also [13C40](#)]
- 14M15 Grassmannians, Schubert varieties, flag manifolds [See also [32M10](#), [51M35](#)]

14M17	Homogeneous spaces and generalizations [See also 32M10 , 53C30 , 57T15]	15A72	Vector and tensor algebra, theory of invariants [See also 13A50 , 14L24]
14M20	Rational and unirational varieties [See also 14E08]	15A75	Exterior algebra, Grassmann algebras
14M22	Rationally connected varieties	15A78	Other algebras built from modules
14M25	Toric varieties, Newton polyhedra [See also 52B20]	15A80	Max-plus and related algebras
14M27	Compactifications; symmetric and spherical varieties	15A83	Matrix completion problems
14M30	Supervarieties [See also 32C11 , 58A50]	15A86	Linear preserver problems
14M99	None of the above, but in this section	15A99	Miscellaneous topics
14Nxx	Projective and enumerative geometry [See also 51–XX]	15Bxx	Special matrices
14N05	Projective techniques [See also 51N35]	15B05	Toeplitz, Cauchy, and related matrices
14N10	Enumerative problems (combinatorial problems)	15B10	Orthogonal matrices
14N15	Classical problems, Schubert calculus	15B15	Fuzzy matrices
14N20	Configurations and arrangements of linear subspaces	15B33	Matrices over special rings (quaternions, finite fields, etc.)
14N25	Varieties of low degree	15B34	Boolean and Hadamard matrices
14N30	Adjunction problems	15B35	Sign pattern matrices
14N35	Gromov-Witten invariants, quantum cohomology, Gopakumar-Vafa invariants, Donaldson-Thomas invariants [See also 53D45]	15B36	Matrices of integers [See also 11C20]
14N99	None of the above, but in this section	15B48	Positive matrices and their generalizations; cones of matrices
14Pxx	Real algebraic and real analytic geometry	15B51	Stochastic matrices
14P05	Real algebraic sets [See also 12D15 , 13J30]	15B52	Random matrices
14P10	Semialgebraic sets and related spaces	15B57	Hermitian, skew-Hermitian, and related matrices
14P15	Real analytic and semianalytic sets [See also 32B20 , 32C05]	15B99	None of the above, but in this section
14P20	Nash functions and manifolds [See also 32C07 , 58A07]	16–XX	ASSOCIATIVE RINGS AND ALGEBRAS {For the commutative case, see 13–XX}
14P25	Topology of real algebraic varieties	16–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
14P99	None of the above, but in this section	16–01	Instructional exposition (textbooks, tutorial papers, etc.)
14Qxx	Computational aspects in algebraic geometry [See also 12Y05 , 13Pxx , 68W30]	16–02	Research exposition (monographs, survey articles)
14Q05	Curves	16–03	Historical (must also be assigned at least one classification number from Section 01)
14Q10	Surfaces, hypersurfaces	16–04	Explicit machine computation and programs (not the theory of computation or programming)
14Q15	Higher-dimensional varieties	16–06	Proceedings, conferences, collections, etc.
14Q20	Effectivity, complexity	16Bxx	General and miscellaneous
14Q99	None of the above, but in this section	16B50	Category-theoretic methods and results (except as in 16D90) [See also 18–XX]
14Rxx	Affine geometry	16B70	Applications of logic [See also 03Cxx]
14R05	Classification of affine varieties	16B99	None of the above, but in this section
14R10	Affine spaces (automorphisms, embeddings, exotic structures, cancellation problem)	16Dxx	Modules, bimodules and ideals
14R15	Jacobian problem [See also 13F20]	16D10	General module theory
14R20	Group actions on affine varieties [See also 13A50 , 14L30]	16D20	Bimodules
14R25	Affine fibrations [See also 14D06]	16D25	Ideals
14R99	None of the above, but in this section	16D30	Infinite-dimensional simple rings (except as in 16Kxx)
14Txx	Tropical geometry [See also 12K10 , 14M25 , 14N10 , 52B20]	16D40	Free, projective, and flat modules and ideals [See also 19A13]
14T05	Tropical geometry [See also 12K10 , 14M25 , 14N10 , 52B20]	16D50	Injective modules, self-injective rings [See also 16L60]
14T99	None of the above, but in this section	16D60	Simple and semisimple modules, primitive rings and ideals
15–XX	LINEAR AND MULTILINEAR ALGEBRA; MATRIX THEORY	16D70	Structure and classification (except as in 16Gxx), direct sum decomposition, cancellation
15–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	16D80	Other classes of modules and ideals [See also 16G50]
15–01	Instructional exposition (textbooks, tutorial papers, etc.)	16D90	Module categories [See also 16Gxx , 16S90]; module theory in a category-theoretic context; Morita equivalence and duality
15–02	Research exposition (monographs, survey articles)	16D99	None of the above, but in this section
15–03	Historical (must also be assigned at least one classification number from Section 01)	16Exx	Homological methods {For commutative rings, see 13Dxx; for general categories, see 18Gxx}
15–04	Explicit machine computation and programs (not the theory of computation or programming)	16E05	Syzygies, resolutions, complexes
15–06	Proceedings, conferences, collections, etc.	16E10	Homological dimension
15Axx	Basic linear algebra	16E20	Grothendieck groups, K -theory, etc. [See also 18F30 , 19Axx , 19D50]
15A03	Vector spaces, linear dependence, rank	16E30	Homological functors on modules (Tor, Ext, etc.)
15A04	Linear transformations, semilinear transformations	16E35	Derived categories
15A06	Linear equations	16E40	(Co)homology of rings and algebras (e.g. Hochschild, cyclic, dihedral, etc.)
15A09	Matrix inversion, generalized inverses	16E45	Differential graded algebras and applications
15A12	Conditioning of matrices [See also 65F35]	16E50	von Neumann regular rings and generalizations
15A15	Determinants, permanents, other special matrix functions [See also 19B10 , 19B14]	16E60	Semihiereditary and hereditary rings, free ideal rings, Sylvester rings, etc.
15A16	Matrix exponential and similar functions of matrices	16E65	Homological conditions on rings (generalizations of regular, Gorenstein, Cohen-Macaulay rings, etc.)
15A18	Eigenvalues, singular values, and eigenvectors	16E99	None of the above, but in this section
15A21	Canonical forms, reductions, classification	16Gxx	Representation theory of rings and algebras
15A22	Matrix pencils [See also 47A56]	16G10	Representations of Artinian rings
15A23	Factorization of matrices	16G20	Representations of quivers and partially ordered sets
15A24	Matrix equations and identities	16G30	Representations of orders, lattices, algebras over commutative rings [See also 16Hxx]
15A27	Commutativity	16G50	Cohen-Macaulay modules
15A29	Inverse problems	16G60	Representation type (finite, tame, wild, etc.)
15A30	Algebraic systems of matrices [See also 16S50 , 20Gxx , 20Hxx]	16G70	Auslander-Reiten sequences (almost split sequences) and Auslander-Reiten quivers
15A33	Matrices over special rings (quaternions, finite fields, etc.)	16G99	None of the above, but in this section
15A39	Linear inequalities		
15A42	Inequalities involving eigenvalues and eigenvectors		
15A45	Miscellaneous inequalities involving matrices		
15A54	Matrices over function rings in one or more variables		
15A60	Norms of matrices, numerical range, applications of functional analysis to matrix theory [See also 65F35 , 65J05]		
15A63	Quadratic and bilinear forms, inner products [See mainly 11Exx]		
15A66	Clifford algebras, spinors		
15A69	Multilinear algebra, tensor products		

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16Hxx	Algebras and orders {For arithmetic aspects, see 11R52 , 11R54 , 11S45 ; for representation theory, see 16G30 }
16H05	Separable algebras (e.g., quaternion algebras, Azumaya algebras, etc.)
16H10	Orders in separable algebras
16H15	Commutative orders
16H20	Lattices over orders
16H99	None of the above, but in this section
16Kxx	Division rings and semisimple Artin rings [See also 12E15 , 15A30]
16K20	Finite-dimensional {For crossed products, see 16S35 }
16K40	Infinite-dimensional and general
16K50	Brauer groups [See also 12G05 , 14F22]
16K99	None of the above, but in this section
16Lxx	Local rings and generalizations
16L30	Noncommutative local and semilocal rings, perfect rings
16L60	Quasi-Frobenius rings [See also 16D50]
16L99	None of the above, but in this section
16Nxx	Radicals and radical properties of rings
16N20	Jacobson radical, quasimultiplication
16N40	Nil and nilpotent radicals, sets, ideals, rings
16N60	Prime and semiprime rings [See also 16D60 , 16U10]
16N80	General radicals and rings {For radicals in module categories, see 16S90 }
16N99	None of the above, but in this section
16Pxx	Chain conditions, growth conditions, and other forms of finiteness
16P10	Finite rings and finite-dimensional algebras {For semisimple, see 16K20 ; for commutative, see 11Txx , 13Mxx }
16P20	Artinian rings and modules
16P40	Noetherian rings and modules
16P50	Localization and Noetherian rings [See also 16U20]
16P60	Chain conditions on annihilators and summands: Goldie-type conditions [See also 16U20], Krull dimension
16P70	Chain conditions on other classes of submodules, ideals, subrings, etc.; coherence
16P90	Growth rate, Gelfand-Kirillov dimension
16P99	None of the above, but in this section
16Rxx	Rings with polynomial identity
16R10	T -ideals, identities, varieties of rings and algebras
16R20	Semiprime p.i. rings, rings embeddable in matrices over commutative rings
16R30	Trace rings and invariant theory
16R40	Identities other than those of matrices over commutative rings
16R50	Other kinds of identities (generalized polynomial, rational, involution)
16R60	Functional identities
16R99	None of the above, but in this section
16Sxx	Rings and algebras arising under various constructions
16S10	Rings determined by universal properties (free algebras, coproducts, adjunction of inverses, etc.)
16S15	Finite generation, finite presentability, normal forms (diamond lemma, term-rewriting)
16S20	Centralizing and normalizing extensions
16S30	Universal enveloping algebras of Lie algebras [See mainly 17B35]
16S32	Rings of differential operators [See also 13N10 , 32C38]
16S34	Group rings [See also 20C05 , 20C07], Laurent polynomial rings
16S35	Twisted and skew group rings, crossed products
16S36	Ordinary and skew polynomial rings and semigroup rings [See also 20M25]
16S37	Quadratic and Koszul algebras
16S38	Rings arising from non-commutative algebraic geometry [See also 14A22]
16S40	Smash products of general Hopf actions [See also 16T05]
16S50	Endomorphism rings; matrix rings [See also 15-XX]
16S60	Rings of functions, subdirect products, sheaves of rings
16S70	Extensions of rings by ideals
16S80	Deformations of rings [See also 13D10 , 14D15]
16S85	Rings of fractions and localizations [See also 13B30]
16S90	Torsion theories; radicals on module categories [See also 13D30 , 18E40] {For radicals of rings, see 16Nxx }
16S99	None of the above, but in this section
16Txx	Hopf algebras, quantum groups and related topics
16T05	Hopf algebras and their applications [See also 16S40 , 57T05]
16T10	Bialgebras
16T15	Coalgebras and comodules; corings
16T20	Ring-theoretic aspects of quantum groups [See also 17B37 , 20G42 , 81R50]
16T25	Yang-Baxter equations
16T30	Connections with combinatorics
16T99	None of the above, but in this section

16Uxx	Conditions on elements
16U10	Integral domains
16U20	Ore rings, multiplicative sets, Ore localization
16U30	Divisibility, noncommutative UFDs
16U60	Units, groups of units
16U70	Center, normalizer (invariant elements)
16U80	Generalizations of commutativity
16U99	None of the above, but in this section
16Wxx	Rings and algebras with additional structure
16W10	Rings with involution; Lie, Jordan and other nonassociative structures [See also 17B60 , 17C50 , 46Kxx]
16W20	Automorphisms and endomorphisms
16W22	Actions of groups and semigroups; invariant theory
16W25	Derivations, actions of Lie algebras
16W50	Graded rings and modules
16W55	“Super” (or “skew”) structure [See also 17A70 , 17Bxx , 17C70] {For exterior algebras, see 15A75 ; for Clifford algebras, see 11E88 , 15A66 }
16W60	Valuations, completions, formal power series and related constructions [See also 13Jxx]
16W70	Filtered rings; filtrational and graded techniques
16W80	Topological and ordered rings and modules [See also 06F25 , 13Jxx]
16W99	None of the above, but in this section
16Yxx	Generalizations { For nonassociative rings, see 17-XX }
16Y30	Near-rings [See also 12K05]
16Y60	Semirings [See also 12K10]
16Y99	None of the above, but in this section
16Zxx	Computational aspects of associative rings
16Z05	Computational aspects of associative rings [See also 68W30]
16Z99	None of the above, but in this section
17-XX	NONASSOCIATIVE RINGS AND ALGEBRAS
17-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
17-01	Instructional exposition (textbooks, tutorial papers, etc.)
17-02	Research exposition (monographs, survey articles)
17-03	Historical (must also be assigned at least one classification number from Section 01)
17-04	Explicit machine computation and programs (not the theory of computation or programming)
17-06	Proceedings, conferences, collections, etc.
17-08	Computational methods
17Axx	General nonassociative rings
17A01	General theory
17A05	Power-associative rings
17A15	Noncommutative Jordan algebras
17A20	Flexible algebras
17A30	Algebras satisfying other identities
17A32	Leibniz algebras
17A35	Division algebras
17A36	Automorphisms, derivations, other operators
17A40	Ternary compositions
17A42	Other n -ary compositions ($n \geq 3$)
17A45	Quadratic algebras (but not quadratic Jordan algebras)
17A50	Free algebras
17A60	Structure theory
17A65	Radical theory
17A70	Superalgebras
17A75	Composition algebras
17A80	Valued algebras
17A99	None of the above, but in this section
17Bxx	Lie algebras and Lie superalgebras { For Lie groups, see 22Exx }
17B01	Identities, free Lie (super)algebras
17B05	Structure theory
17B08	Coadjoint orbits; nilpotent varieties
17B10	Representations, algebraic theory (weights)
17B15	Representations, analytic theory
17B20	Simple, semisimple, reductive (super)algebras
17B22	Root systems
17B25	Exceptional (super)algebras
17B30	Solvable, nilpotent (super)algebras
17B35	Universal enveloping (super)algebras [See also 16S30]
17B37	Quantum groups (quantized enveloping algebras) and related deformations [See also 16T20 , 20G42 , 81R50 , 82B23]
17B40	Automorphisms, derivations, other operators
17B45	Lie algebras of linear algebraic groups [See also 14Lxx and 20Gxx]
17B50	Modular Lie (super)algebras
17B55	Homological methods in Lie (super)algebras
17B56	Cohomology of Lie (super)algebras
17B60	Lie (super)algebras associated with other structures (associative, Jordan, etc.) [See also 16W10 , 17C40 , 17C50]
17B62	Lie bialgebras; Lie coalgebras

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17B63	Poisson algebras	18B40	Groupoids, semigroupoids, semigroups, groups (viewed as categories) [See also 20Axx , 20L05 , 20Mxx]
17B65	Infinite-dimensional Lie (super)algebras [See also 22E65]	18B99	None of the above, but in this section
17B66	Lie algebras of vector fields and related (super) algebras	18Cxx	Categories and theories
17B67	Kac-Moody (super)algebras; extended affine Lie algebras; toroidal Lie algebras	18C05	Equational categories [See also 03C05 , 08C05]
17B68	Virasoro and related algebras	18C10	Theories (e.g. algebraic theories), structure, and semantics [See also 03G30]
17B69	Vertex operators; vertex operator algebras and related structures	18C15	Triples (= standard construction, monad or triad), algebras for a triple, homology and derived functors for triples [See also 18Gxx]
17B70	Graded Lie (super)algebras	18C20	Algebras and Kleisli categories associated with monads
17B75	Color Lie (super)algebras	18C30	Sketches and generalizations
17B80	Applications to integrable systems	18C35	Accessible and locally presentable categories
17B81	Applications to physics	18C50	Categorical semantics of formal languages [See also 68Q55 , 68Q65]
17B99	None of the above, but in this section	18C99	None of the above, but in this section
17Cxx	Jordan algebras (algebras, triples and pairs)	18Dxx	Categories with structure
17C05	Identities and free Jordan structures	18D05	Double categories, 2-categories, bicategories and generalizations
17C10	Structure theory	18D10	Monoidal categories (= multiplicative categories), symmetric monoidal categories, braided categories [See also 19D23]
17C17	Radicals	18D15	Closed categories (closed monoidal and Cartesian closed categories, etc.)
17C20	Simple, semisimple algebras	18D20	Enriched categories (over closed or monoidal categories)
17C27	Idempotents, Peirce decompositions	18D25	Strong functors, strong adjunctions
17C30	Associated groups, automorphisms	18D30	Fibered categories
17C36	Associated manifolds	18D35	Structured objects in a category (group objects, etc.)
17C37	Associated geometries	18D50	Operads [See also 55P48]
17C40	Exceptional Jordan structures	18D99	None of the above, but in this section
17C50	Jordan structures associated with other structures [See also 16W10]	18Exx	Abelian categories
17C55	Finite-dimensional structures	18E05	Preadditive, additive categories
17C60	Division algebras	18E10	Exact categories, abelian categories
17C65	Jordan structures on Banach spaces and algebras [See also 46H70 , 46L70]	18E15	Grothendieck categories
17C70	Super structures	18E20	Embedding theorems [See also 18B15]
17C90	Applications to physics	18E25	Derived functors and satellites
17C99	None of the above, but in this section	18E30	Derived categories, triangulated categories
17Dxx	Other nonassociative rings and algebras	18E35	Localization of categories
17D05	Alternative rings	18E40	Torsion theories, radicals [See also 13D30 , 16S90]
17D10	Mal'cev (Mal'tsev) rings and algebras	18E99	None of the above, but in this section
17D15	Right alternative rings	18Fxx	Categories and geometry
17D20	(γ, δ) -rings, including $(1, -1)$ -rings	18F05	Local categories and functors
17D25	Lie-admissible algebras	18F10	Grothendieck topologies [See also 14F20]
17D92	Genetic algebras	18F15	Abstract manifolds and fiber bundles [See also 55Rxx , 57Pxx]
17D99	None of the above, but in this section	18F20	Presheaves and sheaves [See also 14F05 , 32C35 , 32L10 , 54B40 , 55N30]
18-XX	CATEGORY THEORY; HOMOLOGICAL ALGEBRA {For commutative rings see 13Dxx, for associative rings 16Exx, for groups 20Jxx, for topological groups and related structures 57Txx; see also 55Nxx and 55Uxx for algebraic topology}	18F25	Algebraic K -theory and L -theory [See also 11Exx , 11R70 , 11S70 , 12-XX , 13D15 , 14Cxx , 16E20 , 19-XX , 46L80 , 57R65 , 57R67]
18-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	18F30	Grothendieck groups [See also 13D15 , 16E20 , 19Axx]
18-01	Instructional exposition (textbooks, tutorial papers, etc.)	18F99	None of the above, but in this section
18-02	Research exposition (monographs, survey articles)	18Gxx	Homological algebra [See also 13Dxx , 16Exx , 20Jxx , 55Nxx , 55Uxx , 57Txx]
18-03	Historical (must also be assigned at least one classification number from Section 01)	18G05	Projectives and injectives [See also 13C10 , 13C11 , 16D40 , 16D50]
18-04	Explicit machine computation and programs (not the theory of computation or programming)	18G10	Resolutions; derived functors [See also 13D02 , 16E05 , 18E25]
18-06	Proceedings, conferences, collections, etc.	18G15	Ext and Tor, generalizations, Künneth formula [See also 55U25]
18Axx	General theory of categories and functors	18G20	Homological dimension [See also 13D05 , 16E10]
18A05	Definitions, generalizations	18G25	Relative homological algebra, projective classes
18A10	Graphs, diagram schemes, precategories [See especially 20L05]	18G30	Simplicial sets, simplicial objects (in a category) [See also 55U10]
18A15	Foundations, relations to logic and deductive systems [See also 03-XX]	18G35	Chain complexes [See also 18E30 , 55U15]
18A20	Epimorphisms, monomorphisms, special classes of morphisms, null morphisms	18G40	Spectral sequences, hypercohomology [See also 55Txx]
18A22	Special properties of functors (faithful, full, etc.)	18G50	Nonabelian homological algebra
18A23	Natural morphisms, dinatural morphisms	18G55	Homotopical algebra
18A25	Functor categories, comma categories	18G60	Other (co)homology theories [See also 19D55 , 46L80 , 58J20 , 58J22]
18A30	Limits and colimits (products, sums, directed limits, pushouts, fiber products, equalizers, kernels, ends and coends, etc.)	18G99	None of the above, but in this section
18A32	Factorization of morphisms, substructures, quotient structures, congruences, amalgams	19-XX	K-THEORY [See also 16E20 , 18F25]
18A35	Categories admitting limits (complete categories), functors preserving limits, completions	19-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
18A40	Adjoint functors (universal constructions, reflective subcategories, Kan extensions, etc.)	19-01	Instructional exposition (textbooks, tutorial papers, etc.)
18A99	None of the above, but in this section	19-02	Research exposition (monographs, survey articles)
18Bxx	Special categories	19-03	Historical (must also be assigned at least one classification number from Section 01)
18B05	Category of sets, characterizations [See also 03-XX]	19-04	Explicit machine computation and programs (not the theory of computation or programming)
18B10	Category of relations, additive relations	19-06	Proceedings, conferences, collections, etc.
18B15	Embedding theorems, universal categories [See also 18E20]	19Axx	Grothendieck groups and K_0 [See also 13D15 , 18F30]
18B20	Categories of machines, automata, operative categories [See also 03D05 , 68Qxx]	19A13	Stability for projective modules [See also 13C10]
18B25	Topoi [See also 03G30]	19A15	Efficient generation
18B30	Categories of topological spaces and continuous mappings [See also 54-XX]	19A22	Frobenius induction, Burnside and representation rings
18B35	Preorders, orders and lattices (viewed as categories) [See also 06-XX]	19A31	K_0 of group rings and orders
		19A49	K_0 of other rings
		19A99	None of the above, but in this section

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19Bxx	Whitehead groups and K_1	20Bxx	Permutation groups
19B10	Stable range conditions	20B05	General theory for finite groups
19B14	Stability for linear groups	20B07	General theory for infinite groups
19B28	K_1 of group rings and orders [See also 57Q10]	20B10	Characterization theorems
19B37	Congruence subgroup problems [See also 20H05]	20B15	Primitive groups
19B99	None of the above, but in this section	20B20	Multiply transitive finite groups
19Cxx	Steinberg groups and K_2	20B22	Multiply transitive infinite groups
19C09	Central extensions and Schur multipliers	20B25	Finite automorphism groups of algebraic, geometric, or combinatorial structures [See also 05Bxx , 12F10 , 20G40 , 20H30 , 51-XX]
19C20	Symbols, presentations and stability of K_2	20B27	Infinite automorphism groups [See also 12F10]
19C30	K_2 and the Brauer group	20B30	Symmetric groups
19C40	Excision for K_2	20B35	Subgroups of symmetric groups
19C99	None of the above, but in this section	20B40	Computational methods
19Dxx	Higher algebraic K-theory	20B99	None of the above, but in this section
19D06	Q - and plus-constructions	20Cxx	Representation theory of groups [See also 19A22 (for representation rings and Burnside rings)]
19D10	Algebraic K -theory of spaces	20C05	Group rings of finite groups and their modules [See also 16S34]
19D23	Symmetric monoidal categories [See also 18D10]	20C07	Group rings of infinite groups and their modules [See also 16S34]
19D25	Karoubi-Villamayor-Gersten K -theory	20C08	Hecke algebras and their representations
19D35	Negative K -theory, NK and Nil	20C10	Integral representations of finite groups
19D45	Higher symbols, Milnor K -theory	20C11	p -adic representations of finite groups
19D50	Computations of higher K -theory of rings [See also 13D15 , 16E20]	20C12	Integral representations of infinite groups
19D55	K -theory and homology; cyclic homology and cohomology [See also 18G60]	20C15	Ordinary representations and characters
19D99	None of the above, but in this section	20C20	Modular representations and characters
19Exx	K-theory in geometry	20C25	Projective representations and multipliers
19E08	K -theory of schemes [See also 14C35]	20C30	Representations of finite symmetric groups
19E15	Algebraic cycles and motivic cohomology [See also 14C25 , 14C35 , 14F42]	20C32	Representations of infinite symmetric groups
19E20	Relations with cohomology theories [See also 14Fxx]	20C33	Representations of finite groups of Lie type
19E99	None of the above, but in this section	20C34	Representations of sporadic groups
19Fxx	K-theory in number theory [See also 11R70, 11S70]	20C35	Applications of group representations to physics
19F05	Generalized class field theory [See also 11G45]	20C40	Computational methods
19F15	Symbols and arithmetic [See also 11R37]	20C99	None of the above, but in this section
19F27	Étale cohomology, higher regulators, zeta and L -functions [See also 11G40 , 11R42 , 11S40 , 14F20 , 14G10]	20Dxx	Abstract finite groups
19F99	None of the above, but in this section	20D05	Finite simple groups and their classification
19Gxx	K-theory of forms [See also 11Exx]	20D06	Simple groups: alternating groups and groups of Lie type [See also 20Gxx]
19G05	Stability for quadratic modules	20D08	Simple groups: sporadic groups
19G12	Witt groups of rings [See also 11E81]	20D10	Solvable groups, theory of formations, Schunck classes, Fitting classes, π -length, ranks [See also 20F17]
19G24	L -theory of group rings [See also 11E81]	20D15	Nilpotent groups, p -groups
19G38	Hermitian K -theory, relations with K -theory of rings	20D20	Sylow subgroups, Sylow properties, π -groups, π -structure
19G99	None of the above, but in this section	20D25	Special subgroups (Fratini, Fitting, etc.)
19Jxx	Obstructions from topology	20D30	Series and lattices of subgroups
19J05	Finiteness and other obstructions in K_0	20D35	Subnormal subgroups
19J10	Whitehead (and related) torsion	20D40	Products of subgroups
19J25	Surgery obstructions [See also 57R67]	20D45	Automorphisms
19J35	Obstructions to group actions	20D60	Arithmetic and combinatorial problems
19J99	None of the above, but in this section	20D99	None of the above, but in this section
19Kxx	K-theory and operator algebras [See mainly 46L80, and also 46M20]	20Exx	Structure and classification of infinite or finite groups
19K14	K_0 as an ordered group, traces	20E05	Free nonabelian groups
19K33	EXT and K -homology [See also 55N22]	20E06	Free products, free products with amalgamation, Higman-Neumann-Neumann extensions, and generalizations
19K35	Kasparov theory (KK -theory) [See also 58J22]	20E07	Subgroup theorems; subgroup growth
19K56	Index theory [See also 58J20 , 58J22]	20E08	Groups acting on trees [See also 20F65]
19K99	None of the above, but in this section	20E10	Quasivarieties and varieties of groups
19Lxx	Topological K-theory [See also 55N15, 55R50, 55S25]	20E15	Chains and lattices of subgroups, subnormal subgroups [See also 20F22]
19L10	Riemann-Roch theorems, Chern characters	20E18	Limits, profinite groups
19L20	J -homomorphism, Adams operations [See also 55Q50]	20E22	Extensions, wreath products, and other compositions [See also 20J05]
19L41	Connective K -theory, cobordism [See also 55N22]	20E25	Local properties
19L47	Equivariant K -theory [See also 55N91 , 55P91 , 55Q91 , 55R91 , 55S91]	20E26	Residual properties and generalizations; residually finite groups
19L50	Twisted K -theory; differential K -theory	20E28	Maximal subgroups
19L64	Computations, geometric applications	20E32	Simple groups [See also 20D05]
19L99	None of the above, but in this section	20E34	General structure theorems
19Mxx	Miscellaneous applications of K-theory	20E36	Automorphisms of infinite groups [For automorphisms of finite groups, see 20D45]
19M05	Miscellaneous applications of K -theory	20E42	Groups with a BN -pair; buildings [See also 51E24]
19M99	None of the above, but in this section	20E45	Conjugacy classes
20-XX	GROUP THEORY AND GENERALIZATIONS	20E99	None of the above, but in this section
20-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	20Fxx	Special aspects of infinite or finite groups
20-01	Instructional exposition (textbooks, tutorial papers, etc.)	20F05	Generators, relations, and presentations
20-02	Research exposition (monographs, survey articles)	20F06	Cancellation theory; application of van Kampen diagrams [See also 57M05]
20-03	Historical (must also be assigned at least one classification number from Section 01)	20F10	Word problems, other decision problems, connections with logic and automata [See also 03B25 , 03D05 , 03D40 , 06B25 , 08A50 , 20M05 , 68Q70]
20-04	Explicit machine computation and programs (not the theory of computation or programming)	20F11	Groups of finite Morley rank [See also 03C45 , 03C60]
20-06	Proceedings, conferences, collections, etc.	20F12	Commutator calculus
20Axx	Foundations	20F14	Derived series, central series, and generalizations
20A05	Axiomatics and elementary properties	20F16	Solvable groups, supersolvable groups [See also 20D10]
20A10	Metamathematical considerations {For word problems, see 20F10 }		
20A15	Applications of logic to group theory		
20A99	None of the above, but in this section		

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20F17	Formations of groups, Fitting classes [See also 20D10]	20Mxx	Semigroups
20F18	Nilpotent groups [See also 20D15]	20M05	Free semigroups, generators and relations, word problems [See also 03D40, 08A50, 20F10]
20F19	Generalizations of solvable and nilpotent groups	20M07	Varieties and pseudovarieties of semigroups
20F22	Other classes of groups defined by subgroup chains	20M10	General structure theory
20F24	FC-groups and their generalizations	20M11	Radical theory
20F28	Automorphism groups of groups [See also 20E36]	20M12	Ideal theory
20F29	Representations of groups as automorphism groups of algebraic systems	20M13	Arithmetic theory of monoids
20F34	Fundamental groups and their automorphisms [See also 57M05, 57Sxx]	20M14	Commutative semigroups
20F36	Braid groups; Artin groups	20M15	Mappings of semigroups
20F38	Other groups related to topology or analysis	20M17	Regular semigroups
20F40	Associated Lie structures	20M18	Inverse semigroups
20F45	Engel conditions	20M19	Orthodox semigroups
20F50	Periodic groups; locally finite groups	20M20	Semigroups of transformations, etc. [See also 47D03, 47H20, 54H15]
20F55	Reflection and Coxeter groups [See also 22E40, 51F15]	20M25	Semigroup rings, multiplicative semigroups of rings [See also 16S36, 16Y60]
20F60	Ordered groups [See mainly 06F15]	20M30	Representation of semigroups; actions of semigroups on sets
20F65	Geometric group theory [See also 05C25, 20E08, 57Mxx]	20M32	Algebraic monoids
20F67	Hyperbolic groups and nonpositively curved groups	20M35	Semigroups in automata theory, linguistics, etc. [See also 03D05, 68Q70, 68T50]
20F69	Asymptotic properties of groups	20M50	Connections of semigroups with homological algebra and category theory
20F70	Algebraic geometry over groups; equations over groups	20M99	None of the above, but in this section
20F99	None of the above, but in this section	20Nxx	Other generalizations of groups
20Gxx	Linear algebraic groups and related topics {For arithmetic theory, see 11E57, 11H56; for geometric theory, see 14Lxx, 22Exx; for other methods in representation theory, see 15A30, 22E45, 22E46, 22E47, 22E50, 22E55}	20N02	Sets with a single binary operation (groupoids)
20G05	Representation theory	20N05	Loops, quasigroups [See also 05Bxx]
20G07	Structure theory	20N10	Ternary systems (heaps, semiheaps, heapoids, etc.)
20G10	Cohomology theory	20N15	n -ary systems ($n \geq 3$)
20G15	Linear algebraic groups over arbitrary fields	20N20	Hypergroups
20G20	Linear algebraic groups over the reals, the complexes, the quaternions	20N25	Fuzzy groups [See also 03E72]
20G25	Linear algebraic groups over local fields and their integers	20N99	None of the above, but in this section
20G30	Linear algebraic groups over global fields and their integers	20Pxx	Probabilistic methods in group theory [See also 60Bxx]
20G35	Linear algebraic groups over adèles and other rings and schemes	20P05	Probabilistic methods in group theory [See also 60Bxx]
20G40	Linear algebraic groups over finite fields	20P99	None of the above, but in this section
20G41	Exceptional groups	22–XX	TOPOLOGICAL GROUPS, LIE GROUPS {For transformation groups, see 54H15, 57Sxx, 58–XX. For abstract harmonic analysis, see 43–XX}
20G42	Quantum groups (quantized function algebras) and their representations [See also 16T20, 17B37, 81R50]	22–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
20G43	Schur and q -Schur algebras	22–01	Instructional exposition (textbooks, tutorial papers, etc.)
20G44	Kac-Moody groups	22–02	Research exposition (monographs, survey articles)
20G45	Applications to physics	22–03	Historical (must also be assigned at least one classification number from Section 01)
20G99	None of the above, but in this section	22–04	Explicit machine computation and programs (not the theory of computation or programming)
20Hxx	Other groups of matrices [See also 15A30]	22–06	Proceedings, conferences, collections, etc.
20H05	Unimodular groups, congruence subgroups [See also 11F06, 19B37, 22E40, 51F20]	22Axx	Topological and differentiable algebraic systems {For topological rings and fields, see 12Jxx, 13Jxx, 16W80}
20H10	Fuchsian groups and their generalizations [See also 11F06, 22E40, 30F35, 32Nxx]	22A05	Structure of general topological groups
20H15	Other geometric groups, including crystallographic groups [See also 51–XX, especially 51F15, and 82D25]	22A10	Analysis on general topological groups
20H20	Other matrix groups over fields	22A15	Structure of topological semigroups
20H25	Other matrix groups over rings	22A20	Analysis on topological semigroups
20H30	Other matrix groups over finite fields	22A22	Topological groupoids (including differentiable and Lie groupoids) [See also 58H05]
20H99	None of the above, but in this section	22A25	Representations of general topological groups and semigroups
20Jxx	Connections with homological algebra and category theory	22A26	Topological semilattices, lattices and applications [See also 06B30, 06B35, 06F30]
20J05	Homological methods in group theory	22A30	Other topological algebraic systems and their representations
20J06	Cohomology of groups	22A99	None of the above, but in this section
20J15	Category of groups	22Bxx	Locally compact abelian groups (LCA groups)
20J99	None of the above, but in this section	22B05	General properties and structure of LCA groups
20Kxx	Abelian groups	22B10	Structure of group algebras of LCA groups
20K01	Finite abelian groups [For sumsets, see 11B13 and 11P70]	22B99	None of the above, but in this section
20K10	Torsion groups, primary groups and generalized primary groups	22Cxx	Compact groups
20K15	Torsion-free groups, finite rank	22C05	Compact groups
20K20	Torsion-free groups, infinite rank	22C99	None of the above, but in this section
20K21	Mixed groups	22Dxx	Locally compact groups and their algebras
20K25	Direct sums, direct products, etc.	22D05	General properties and structure of locally compact groups
20K27	Subgroups	22D10	Unitary representations of locally compact groups
20K30	Automorphisms, homomorphisms, endomorphisms, etc.	22D12	Other representations of locally compact groups
20K35	Extensions	22D15	Group algebras of locally compact groups
20K40	Homological and categorical methods	22D20	Representations of group algebras
20K45	Topological methods [See also 22A05, 22B05]	22D25	C^* -algebras and W^* -algebras in relation to group representations [See also 46Lxx]
20K99	None of the above, but in this section	22D30	Induced representations
20Lxx	Groupoids (i.e. small categories in which all morphisms are isomorphisms) {For sets with a single binary operation, see 20N02; for topological groupoids, see 22A22, 58H05}	22D35	Duality theorems
20L05	Groupoids (i.e. small categories in which all morphisms are isomorphisms) {For sets with a single binary operation, see 20N02; for topological groupoids, see 22A22, 58H05}	22D40	Ergodic theory on groups [See also 28Dxx]
20L99	None of the above, but in this section	22D45	Automorphism groups of locally compact groups
		22D99	None of the above, but in this section

22Exx	Lie groups {For the topology of Lie groups and homogeneous spaces, see 57Sxx, 57Txx; for analysis thereon, see 43A80, 43A85, 43A90}
22E05	Local Lie groups [See also 34–XX, 35–XX, 58H05]
22E10	General properties and structure of complex Lie groups [See also 32M05]
22E15	General properties and structure of real Lie groups
22E20	General properties and structure of other Lie groups
22E25	Nilpotent and solvable Lie groups
22E27	Representations of nilpotent and solvable Lie groups (special orbital integrals, non-type I representations, etc.)
22E30	Analysis on real and complex Lie groups [See also 33C80, 43–XX]
22E35	Analysis on p -adic Lie groups
22E40	Discrete subgroups of Lie groups [See also 20Hxx, 32Nxx]
22E41	Continuous cohomology [See also 57R32, 57Txx, 58H10]
22E43	Structure and representation of the Lorentz group
22E45	Representations of Lie and linear algebraic groups over real fields: analytic methods {For the purely algebraic theory, see 20G05}
22E46	Semisimple Lie groups and their representations
22E47	Representations of Lie and real algebraic groups: algebraic methods (Verma modules, etc.) [See also 17B10]
22E50	Representations of Lie and linear algebraic groups over local fields [See also 20G05]
22E55	Representations of Lie and linear algebraic groups over global fields and adèle rings [See also 20G05]
22E57	Geometric Langlands program: representation-theoretic aspects [See also 14D24]
22E60	Lie algebras of Lie groups {For the algebraic theory of Lie algebras, see 17Bxx}
22E65	Infinite-dimensional Lie groups and their Lie algebras: general properties [See also 17B65, 58B25, 58H05]
22E66	Analysis on and representations of infinite-dimensional Lie groups
22E67	Loop groups and related constructions, group-theoretic treatment [See also 58D05]
22E70	Applications of Lie groups to physics; explicit representations [See also 81R05, 81R10]
22E99	None of the above, but in this section
22Fxx	Noncompact transformation groups
22F05	General theory of group and pseudogroup actions {For topological properties of spaces with an action, see 57S20}
22F10	Measurable group actions [See also 22D40, 28Dxx, 37Axx]
22F30	Homogeneous spaces {For general actions on manifolds or preserving geometrical structures, see 57M60, 57Sxx; for discrete subgroups of Lie groups, see especially 22E40}
22F50	Groups as automorphisms of other structures
22F99	None of the above, but in this section
26–XX	REAL FUNCTIONS [See also 54C30]
26–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
26–01	Instructional exposition (textbooks, tutorial papers, etc.)
26–02	Research exposition (monographs, survey articles)
26–03	Historical (must also be assigned at least one classification number from Section 01)
26–04	Explicit machine computation and programs (not the theory of computation or programming)
26–06	Proceedings, conferences, collections, etc.
26Axx	Functions of one variable
26A03	Foundations: limits and generalizations, elementary topology of the line
26A06	One-variable calculus
26A09	Elementary functions
26A12	Rate of growth of functions, orders of infinity, slowly varying functions [See also 26A48]
26A15	Continuity and related questions (modulus of continuity, semicontinuity, discontinuities, etc.) {For properties determined by Fourier coefficients, see 42A16; for those determined by approximation properties, see 41A25, 41A27}
26A16	Lipschitz (Hölder) classes
26A18	Iteration [See also 37Bxx, 37Cxx, 37Exx, 39B12, 47H10, 54H25]
26A21	Classification of real functions; Baire classification of sets and functions [See also 03E15, 28A05, 54C50, 54H05]
26A24	Differentiation (functions of one variable): general theory, generalized derivatives, mean-value theorems [See also 28A15]
26A27	Nondifferentiability (nondifferentiable functions, points of nondifferentiability), discontinuous derivatives
26A30	Singular functions, Cantor functions, functions with other special properties
🔥 26A33	Fractional derivatives and integrals
26A36	Antidifferentiation
26A39	Denjoy and Perron integrals, other special integrals
26A42	Integrals of Riemann, Stieltjes and Lebesgue type [See also 28–XX]

26A45	Functions of bounded variation, generalizations
26A46	Absolutely continuous functions
26A48	Monotonic functions, generalizations
26A51	Convexity, generalizations
26A99	None of the above, but in this section
26Bxx	Functions of several variables
26B05	Continuity and differentiation questions
26B10	Implicit function theorems, Jacobians, transformations with several variables
26B12	Calculus of vector functions
26B15	Integration: length, area, volume [See also 28A75, 51M25]
26B20	Integral formulas (Stokes, Gauss, Green, etc.)
26B25	Convexity, generalizations
26B30	Absolutely continuous functions, functions of bounded variation
26B35	Special properties of functions of several variables, Hölder conditions, etc.
26B40	Representation and superposition of functions
26B99	None of the above, but in this section
26Cxx	Polynomials, rational functions
26C05	Polynomials: analytic properties, etc. [See also 12Dxx, 12Exx]
26C10	Polynomials: location of zeros [See also 12D10, 30C15, 65H05]
26C15	Rational functions [See also 14Pxx]
26C99	None of the above, but in this section
26Dxx	Inequalities {For maximal function inequalities, see 42B25; for functional inequalities, see 39B72; for probabilistic inequalities, see 60E15}
26D05	Inequalities for trigonometric functions and polynomials
26D07	Inequalities involving other types of functions
26D10	Inequalities involving derivatives and differential and integral operators
26D15	Inequalities for sums, series and integrals
26D20	Other analytical inequalities
26D99	None of the above, but in this section
26Exx	Miscellaneous topics [See also 58Cxx]
26E05	Real-analytic functions [See also 32B05, 32C05]
26E10	C^∞ -functions, quasi-analytic functions [See also 58C25]
26E15	Calculus of functions on infinite-dimensional spaces [See also 46G05, 58Cxx]
26E20	Calculus of functions taking values in infinite-dimensional spaces [See also 46E40, 46G10, 58Cxx]
26E25	Set-valued functions [See also 28B20, 49J53, 54C60] {For nonsmooth analysis, see 49J52, 58Cxx, 90Cxx}
26E30	Non-Archimedean analysis [See also 12J25]
26E35	Nonstandard analysis [See also 03H05, 28E05, 54J05]
26E40	Constructive real analysis [See also 03F60]
26E50	Fuzzy real analysis [See also 03E72, 28E10]
26E60	Means [See also 47A64]
26E70	Real analysis on time scales or measure chains {For dynamic equations on time scales or measure chains see 34N05}
26E99	None of the above, but in this section
28–XX	MEASURE AND INTEGRATION {For analysis on manifolds, see 58–XX}
28–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
28–01	Instructional exposition (textbooks, tutorial papers, etc.)
28–02	Research exposition (monographs, survey articles)
28–03	Historical (must also be assigned at least one classification number from Section 01)
28–04	Explicit machine computation and programs (not the theory of computation or programming)
28–06	Proceedings, conferences, collections, etc.
28Axx	Classical measure theory
28A05	Classes of sets (Borel fields, σ -rings, etc.), measurable sets, Suslin sets, analytic sets [See also 03E15, 26A21, 54H05]
28A10	Real- or complex-valued set functions
28A12	Contents, measures, outer measures, capacities
28A15	Abstract differentiation theory, differentiation of set functions [See also 26A24]
28A20	Measurable and nonmeasurable functions, sequences of measurable functions, modes of convergence
28A25	Integration with respect to measures and other set functions
28A33	Spaces of measures, convergence of measures [See also 46E27, 60Bxx]
28A35	Measures and integrals in product spaces
28A50	Integration and disintegration of measures
28A51	Lifting theory [See also 46G15]
28A60	Measures on Boolean rings, measure algebras [See also 54H10]
28A75	Length, area, volume, other geometric measure theory [See also 26B15, 49Q15]
28A78	Hausdorff and packing measures
28A80	Fractals [See also 37Fxx]

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28A99	None of the above, but in this section	30C80	Maximum principle; Schwarz's lemma, Lindelöf principle, analogues and generalizations; subordination
28Bxx	Set functions, measures and integrals with values in abstract spaces	30C85	Capacity and harmonic measure in the complex plane [See also 31A15]
28B05	Vector-valued set functions, measures and integrals [See also 46G10]	30C99	None of the above, but in this section
28B10	Group- or semigroup-valued set functions, measures and integrals	30Dxx	Entire and meromorphic functions, and related topics
28B15	Set functions, measures and integrals with values in ordered spaces	30D05	Functional equations in the complex domain, iteration and composition of analytic functions [See also 34Mxx , 37Fxx , 39-XX]
28B20	Set-valued set functions and measures; integration of set-valued functions; measurable selections [See also 26E25 , 54C60 , 54C65 , 91B14]	30D10	Representations of entire functions by series and integrals
28B99	None of the above, but in this section	30D15	Special classes of entire functions and growth estimates
28Cxx	Set functions and measures on spaces with additional structure [See also 46G12, 58C35, 58D20]	30D20	Entire functions, general theory
28C05	Integration theory via linear functionals (Radon measures, Daniell integrals, etc.), representing set functions and measures	30D30	Meromorphic functions, general theory
28C10	Set functions and measures on topological groups or semigroups, Haar measures, invariant measures [See also 22Axx , 43A05]	30D35	Distribution of values, Nevanlinna theory
28C15	Set functions and measures on topological spaces (regularity of measures, etc.)	30D40	Cluster sets, prime ends, boundary behavior
28C20	Set functions and measures and integrals in infinite-dimensional spaces (Wiener measure, Gaussian measure, etc.) [See also 46G12 , 58C35 , 58D20 , 60B11]	30D45	Bloch functions, normal functions, normal families
28C99	None of the above, but in this section	30D60	Quasi-analytic and other classes of functions
28Dxx	Measure-theoretic ergodic theory [See also 11K50, 11K55, 22D40, 37Axx, 47A35, 54H20, 60Fxx, 60G10]	30D99	None of the above, but in this section
28D05	Measure-preserving transformations	30Exx	Miscellaneous topics of analysis in the complex domain
28D10	One-parameter continuous families of measure-preserving transformations	30E05	Moment problems, interpolation problems
28D15	General groups of measure-preserving transformations	30E10	Approximation in the complex domain
28D20	Entropy and other invariants	30E15	Asymptotic representations in the complex domain
28D99	None of the above, but in this section	30E20	Integration, integrals of Cauchy type, integral representations of analytic functions [See also 45Exx]
28Exx	Miscellaneous topics in measure theory	30E25	Boundary value problems [See also 45Exx]
28E05	Nonstandard measure theory [See also 03H05 , 26E35]	30E99	None of the above, but in this section
28E10	Fuzzy measure theory [See also 03E72 , 26E50 , 94D05]	30Fxx	Riemann surfaces
28E15	Other connections with logic and set theory	30F10	Compact Riemann surfaces and uniformization [See also 14H15 , 32G15]
28E99	None of the above, but in this section	30F15	Harmonic functions on Riemann surfaces
30-XX	FUNCTIONS OF A COMPLEX VARIABLE {For analysis on manifolds, see 58-XX}	30F20	Classification theory of Riemann surfaces
30-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	30F25	Ideal boundary theory
30-01	Instructional exposition (textbooks, tutorial papers, etc.)	30F30	Differentials on Riemann surfaces
30-02	Research exposition (monographs, survey articles)	30F35	Fuchsian groups and automorphic functions [See also 11Fxx , 20H10 , 22E40 , 32Gxx , 32Nxx]
30-03	Historical (must also be assigned at least one classification number from Section 01)	30F40	Kleinian groups [See also 20H10]
30-04	Explicit machine computation and programs (not the theory of computation or programming)	30F45	Conformal metrics (hyperbolic, Poincaré, distance functions)
30-06	Proceedings, conferences, collections, etc.	30F50	Klein surfaces
30Axx	General properties	30F60	Teichmüller theory [See also 32G15]
30A05	Monogenic properties of complex functions (including polygenic and areolar monogenic functions)	30F99	None of the above, but in this section
30A10	Inequalities in the complex domain	30Gxx	Generalized function theory
30A99	None of the above, but in this section	30G06	Non-Archimedean function theory [See also 12J25]; nonstandard function theory [See also 03H05]
30Bxx	Series expansions	30G12	Finely holomorphic functions and topological function theory
30B10	Power series (including lacunary series)	30G20	Generalizations of Bers or Vekua type (pseudoanalytic, p -analytic, etc.)
30B20	Random power series	30G25	Discrete analytic functions
30B30	Boundary behavior of power series, over-convergence	30G30	Other generalizations of analytic functions (including abstract-valued functions)
30B40	Analytic continuation	30G35	Functions of hypercomplex variables and generalized variables
30B50	Dirichlet series and other series expansions, exponential series [See also 11M41 , 42-XX]	30G99	None of the above, but in this section
30B60	Completeness problems, closure of a system of functions	30Hxx	Spaces and algebras of analytic functions
30B70	Continued fractions [See also 11A55 , 40A15]	30H05	Bounded analytic functions
30B99	None of the above, but in this section	30H10	Hardy spaces
30Cxx	Geometric function theory	30H15	Nevanlinna class and Smirnov class
30C10	Polynomials	30H20	Bergman spaces, Fock spaces
30C15	Zeros of polynomials, rational functions, and other analytic functions (e.g. zeros of functions with bounded Dirichlet integral) {For algebraic theory, see 12D10 ; for real methods, see 26C10 }	30H25	Besov spaces and Q_p -spaces
30C20	Conformal mappings of special domains	30H30	Bloch spaces
30C25	Covering theorems in conformal mapping theory	30H35	BMO-spaces
30C30	Numerical methods in conformal mapping theory [See also 65E05]	30H50	Algebras of analytic functions
30C35	General theory of conformal mappings	30H80	Corona theorems
30C40	Kernel functions and applications	30H99	None of the above, but in this section
30C45	Special classes of univalent and multivalent functions (starlike, convex, bounded rotation, etc.)	30Jxx	Function theory on the disc
30C50	Coefficient problems for univalent and multivalent functions	30J05	Inner functions
30C55	General theory of univalent and multivalent functions	30J10	Blaschke products
30C62	Quasiconformal mappings in the plane	30J15	Singular inner functions
30C65	Quasiconformal mappings in \mathbf{R}^n , other generalizations	30J99	None of the above, but in this section
30C70	Extremal problems for conformal and quasiconformal mappings, variational methods	30Kxx	Universal holomorphic functions
30C75	Extremal problems for conformal and quasiconformal mappings, other methods	30K05	Universal Taylor series
		30K10	Universal Dirichlet series
		30K15	Bounded universal functions
		30K20	Compositional universality
		30K99	None of the above, but in this section
		30Lxx	Analysis on metric spaces
		30L05	Geometric embeddings of metric spaces
		30L10	Quasiconformal mappings in metric spaces
		30L99	None of the above, but in this section

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31–XX	POTENTIAL THEORY {For probabilistic potential theory, see 60J45 }
31–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
31–01	Instructional exposition (textbooks, tutorial papers, etc.)
31–02	Research exposition (monographs, survey articles)
31–03	Historical (must also be assigned at least one classification number from Section 01)
31–04	Explicit machine computation and programs (not the theory of computation or programming)
31–06	Proceedings, conferences, collections, etc.
31Axx	Two-dimensional theory
31A05	Harmonic, subharmonic, superharmonic functions
31A10	Integral representations, integral operators, integral equations methods
31A15	Potentials and capacity, harmonic measure, extremal length [See also 30C85]
31A20	Boundary behavior (theorems of Fatou type, etc.)
31A25	Boundary value and inverse problems
31A30	Biharmonic, polyharmonic functions and equations, Poisson’s equation
31A35	Connections with differential equations
31A99	None of the above, but in this section
31Bxx	Higher-dimensional theory
31B05	Harmonic, subharmonic, superharmonic functions
31B10	Integral representations, integral operators, integral equations methods
31B15	Potentials and capacities, extremal length
31B20	Boundary value and inverse problems
31B25	Boundary behavior
31B30	Biharmonic and polyharmonic equations and functions
31B35	Connections with differential equations
31B99	None of the above, but in this section
31Cxx	Other generalizations
31C05	Harmonic, subharmonic, superharmonic functions
31C10	Pluriharmonic and plurisubharmonic functions [See also 32U05]
31C12	Potential theory on Riemannian manifolds [See also 53C20 ; for Hodge theory, see 58A14]
31C15	Potentials and capacities
31C20	Discrete potential theory and numerical methods
31C25	Dirichlet spaces
31C35	Martin boundary theory [See also 60J50]
31C40	Fine potential theory
31C45	Other generalizations (nonlinear potential theory, etc.)
31C99	None of the above, but in this section
31Dxx	Axiomatic potential theory
31D05	Axiomatic potential theory
31D99	None of the above, but in this section
31Exx	Potential theory on metric spaces
31E05	Potential theory on metric spaces
31E99	None of the above, but in this section
32–XX	SEVERAL COMPLEX VARIABLES AND ANALYTIC SPACES {For infinite-dimensional holomorphy, see 46G20 , 58B12 }
32–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
32–01	Instructional exposition (textbooks, tutorial papers, etc.)
32–02	Research exposition (monographs, survey articles)
32–03	Historical (must also be assigned at least one classification number from Section 01)
32–04	Explicit machine computation and programs (not the theory of computation or programming)
32–06	Proceedings, conferences, collections, etc.
32Axx	Holomorphic functions of several complex variables
32A05	Power series, series of functions
32A07	Special domains (Reinhardt, Hartogs, circular, tube)
32A10	Holomorphic functions
32A12	Multifunctions
32A15	Entire functions
32A17	Special families of functions
32A18	Bloch functions, normal functions
32A19	Normal families of functions, mappings
32A20	Meromorphic functions
32A22	Nevanlinna theory (local); growth estimates; other inequalities {For geometric theory, see 32H25 , 32H30 }
32A25	Integral representations; canonical kernels (Szegő, Bergman, etc.)
32A26	Integral representations, constructed kernels (e.g. Cauchy, Fantappiè-type kernels)
32A27	Local theory of residues [See also 32C30]


32A30	Other generalizations of function theory of one complex variable (should also be assigned at least one classification number from Section 30) {For functions of several hypercomplex variables, see 30G35 }
32A35	H^p -spaces, Nevanlinna spaces [See also 32M15 , 42B30 , 43A85 , 46J15]
32A36	Bergman spaces
32A37	Other spaces of holomorphic functions (e.g. bounded mean oscillation (BMOA), vanishing mean oscillation (VMOA)) [See also 46Exx]
32A38	Algebras of holomorphic functions [See also 30H05 , 46J10 , 46J15]
32A40	Boundary behavior of holomorphic functions
32A45	Hyperfunctions [See also 46F15]
32A50	Harmonic analysis of several complex variables [See mainly 43–XX]
32A55	Singular integrals
32A60	Zero sets of holomorphic functions
32A65	Banach algebra techniques [See mainly 46Jxx]
32A70	Functional analysis techniques [See mainly 46Exx]
32A99	None of the above, but in this section
32Bxx	Local analytic geometry [See also 13–XX and 14–XX]
32B05	Analytic algebras and generalizations, preparation theorems
32B10	Germes of analytic sets, local parametrization
32B15	Analytic subsets of affine space
32B20	Semi-analytic sets and subanalytic sets [See also 14P15]
32B25	Triangulation and related questions
32B99	None of the above, but in this section
32Cxx	Analytic spaces
32C05	Real-analytic manifolds, real-analytic spaces [See also 14Pxx , 58A07]
32C07	Real-analytic sets, complex Nash functions [See also 14P15 , 14P20]
32C09	Embedding of real analytic manifolds
32C11	Complex supergeometry [See also 14A22 , 14M30 , 58A50]
32C15	Complex spaces
32C18	Topology of analytic spaces
32C20	Normal analytic spaces
32C22	Embedding of analytic spaces
32C25	Analytic subsets and submanifolds
32C30	Integration on analytic sets and spaces, currents {For local theory, see 32A25 or 32A27 }
32C35	Analytic sheaves and cohomology groups [See also 14Fxx , 18F20 , 55N30]
32C36	Local cohomology of analytic spaces
32C37	Duality theorems
32C38	Sheaves of differential operators and their modules, D -modules [See also 14F10 , 16S32 , 35A27 , 58J15]
32C55	The Levi problem in complex spaces; generalizations
32C81	Applications to physics
32C99	None of the above, but in this section
32Dxx	Analytic continuation
32D05	Domains of holomorphy
32D10	Envelopes of holomorphy
32D15	Continuation of analytic objects
32D20	Removable singularities
32D26	Riemann domains
32D99	None of the above, but in this section
32Exx	Holomorphic convexity
32E05	Holomorphically convex complex spaces, reduction theory
32E10	Stein spaces, Stein manifolds
32E20	Polynomial convexity
32E30	Holomorphic and polynomial approximation, Runge pairs, interpolation
32E35	Global boundary behavior of holomorphic functions
32E40	The Levi problem
32E99	None of the above, but in this section
32Fxx	Geometric convexity
32F10	q -convexity, q -concavity
32F17	Other notions of convexity
32F18	Finite-type conditions
32F27	Topological consequences of geometric convexity
32F32	Analytical consequences of geometric convexity (vanishing theorems, etc.)
32F45	Invariant metrics and pseudodistances
32F99	None of the above, but in this section
32Gxx	Deformations of analytic structures
32G05	Deformations of complex structures [See also 13D10 , 16S80 , 58H10 , 58H15]
32G07	Deformations of special (e.g. CR) structures
32G08	Deformations of fiber bundles
32G10	Deformations of submanifolds and subspaces
32G13	Analytic moduli problems {For algebraic moduli problems, see 14D20 , 14D22 , 14H10 , 14J10 } [See also 14H15 , 14J15]
32G15	Moduli of Riemann surfaces, Teichmüller theory [See also 14H15 , 30Fxx]

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32G20	Period matrices, variation of Hodge structure; degenerations [See also 14D05, 14D07, 14K30]	32Q55	Topological aspects of complex manifolds
32G34	Moduli and deformations for ordinary differential equations (e.g. Knizhnik-Zamolodchikov equation) [See also 34Mxx]	32Q57	Classification theorems
32G81	Applications to physics	32Q60	Almost complex manifolds
32G99	None of the above, but in this section	32Q65	Pseudoholomorphic curves
32Hxx	Holomorphic mappings and correspondences	32Q99	None of the above, but in this section
32H02	Holomorphic mappings, (holomorphic) embeddings and related questions	32Sxx	Singularities [See also 58Kxx]
32H04	Meromorphic mappings	32S05	Local singularities [See also 14J17]
32H12	Boundary uniqueness of mappings	32S10	Invariants of analytic local rings
32H25	Picard-type theorems and generalizations {For function-theoretic properties, see 32A22}	32S15	Equisingularity (topological and analytic) [See also 14E15]
32H30	Value distribution theory in higher dimensions {For function-theoretic properties, see 32A22}	32S20	Global theory of singularities; cohomological properties [See also 14E15]
32H35	Proper mappings, finiteness theorems	32S22	Relations with arrangements of hyperplanes [See also 52C35]
32H40	Boundary regularity of mappings	32S25	Surface and hypersurface singularities [See also 14J17]
32H50	Iteration problems	32S30	Deformations of singularities; vanishing cycles [See also 14B07]
32H99	None of the above, but in this section	32S35	Mixed Hodge theory of singular varieties [See also 14C30, 14D07]
32Jxx	Compact analytic spaces {For Riemann surfaces, see 14Hxx, 30Fxx; for algebraic theory, see 14Jxx}	32S40	Monodromy; relations with differential equations and D -modules
32J05	Compactification of analytic spaces	32S45	Modifications; resolution of singularities [See also 14E15]
32J10	Algebraic dependence theorems	32S50	Topological aspects: Lefschetz theorems, topological classification, invariants
32J15	Compact surfaces	32S55	Milnor fibration; relations with knot theory [See also 57M25, 57Q45]
32J17	Compact 3-folds	32S60	Stratifications; constructible sheaves; intersection cohomology [See also 58Kxx]
32J18	Compact n -folds	32S65	Singularities of holomorphic vector fields and foliations
32J25	Transcendental methods of algebraic geometry [See also 14C30]	32S70	Other operations on singularities
32J27	Compact Kähler manifolds: generalizations, classification	32S99	None of the above, but in this section
32J81	Applications to physics	32Txx	Pseudoconvex domains
32J99	None of the above, but in this section	32T05	Domains of holomorphy
32Kxx	Generalizations of analytic spaces (should also be assigned at least one other classification number from Section 32 describing the type of problem)	32T15	Strongly pseudoconvex domains
32K05	Banach analytic spaces [See also 58Bxx]	32T20	Worm domains
32K07	Formal and graded complex spaces [See also 58C50]	32T25	Finite type domains
32K15	Differentiable functions on analytic spaces, differentiable spaces [See also 58C25]	32T27	Geometric and analytic invariants on weakly pseudoconvex boundaries
32K99	None of the above, but in this section	32T35	Exhaustion functions
32Lxx	Holomorphic fiber spaces [See also 55Rxx]	32T40	Peak functions
32L05	Holomorphic bundles and generalizations	32T99	None of the above, but in this section
32L10	Sheaves and cohomology of sections of holomorphic vector bundles, general results [See also 14F05, 18F20, 55N30]	32Uxx	Pluripotential theory
32L15	Bundle convexity [See also 32F10]	32U05	Plurisubharmonic functions and generalizations [See also 31C10]
32L20	Vanishing theorems	32U10	Plurisubharmonic exhaustion functions
32L25	Twistor theory, double fibrations [See also 53C28]	32U15	General pluripotential theory
32L81	Applications to physics	32U20	Capacity theory and generalizations
32L99	None of the above, but in this section	32U25	Lelong numbers
32Mxx	Complex spaces with a group of automorphisms	32U30	Removable sets
32M05	Complex Lie groups, automorphism groups acting on complex spaces [See also 22E10]	32U35	Pluricomplex Green functions
32M10	Homogeneous complex manifolds [See also 14M17, 57T15]	32U40	Currents
32M12	Almost homogeneous manifolds and spaces [See also 14M17]	32U99	None of the above, but in this section
32M15	Hermitian symmetric spaces, bounded symmetric domains, Jordan algebras [See also 22E10, 22E40, 53C35, 57T15]	32Vxx	CR manifolds
32M17	Automorphism groups of \mathbf{C}^n and affine manifolds	32V05	CR structures, CR operators, and generalizations
32M25	Complex vector fields	32V10	CR functions
32M99	None of the above, but in this section	32V15	CR manifolds as boundaries of domains
32Nxx	Automorphic functions [See also 11Fxx, 20H10, 22E40, 30F35]	32V20	Analysis on CR manifolds
32N05	General theory of automorphic functions of several complex variables	32V25	Extension of functions and other analytic objects from CR manifolds
32N10	Automorphic forms	32V30	Embeddings of CR manifolds
32N15	Automorphic functions in symmetric domains	32V35	Finite type conditions on CR manifolds
32N99	None of the above, but in this section	32V40	Real submanifolds in complex manifolds
32Pxx	Non-Archimedean analysis (should also be assigned at least one other classification number from Section 32 describing the type of problem)	32V99	None of the above, but in this section
32P05	Non-Archimedean analysis (should also be assigned at least one other classification number from Section 32 describing the type of problem)	32Wxx	Differential operators in several variables
32P99	None of the above, but in this section	32W05	$\bar{\partial}$ and $\bar{\partial}$ -Neumann operators
32Qxx	Complex manifolds	32W10	$\bar{\partial}_b$ and $\bar{\partial}_b$ -Neumann operators
32Q05	Negative curvature manifolds	32W20	Complex Monge-Ampère operators
32Q10	Positive curvature manifolds	32W25	Pseudodifferential operators in several complex variables
32Q15	Kähler manifolds	32W30	Heat kernels in several complex variables
32Q20	Kähler-Einstein manifolds [See also 53Cxx]	32W50	Other partial differential equations of complex analysis
32Q25	Calabi-Yau theory [See also 14J30]	32W99	None of the above, but in this section
32Q26	Notions of stability	33–XX	SPECIAL FUNCTIONS (33–XX DEALS WITH THE PROPERTIES OF FUNCTIONS AS FUNCTIONS) {For orthogonal functions, see 42Cxx; for aspects of combinatorics see 05Axx; for number-theoretic aspects see 11–XX; for representation theory see 22Exx}
32Q28	Stein manifolds	33–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
32Q30	Uniformization	33–01	Instructional exposition (textbooks, tutorial papers, etc.)
32Q35	Complex manifolds as subdomains of Euclidean space	33–02	Research exposition (monographs, survey articles)
32Q40	Embedding theorems	33–03	Historical (must also be assigned at least one classification number from Section 01)
32Q45	Hyperbolic and Kobayashi hyperbolic manifolds	33–04	Explicit machine computation and programs (not the theory of computation or programming)
		33–06	Proceedings, conferences, collections, etc.

33Bxx	Elementary classical functions	34A25	Analytical theory: series, transformations, transforms, operational calculus, etc. [See also 44–XX]
33B10	Exponential and trigonometric functions	34A26	Geometric methods in differential equations
33B15	Gamma, beta and polygamma functions	34A30	Linear equations and systems, general
33B20	Incomplete beta and gamma functions (error functions, probability integral, Fresnel integrals)	34A33	Lattice differential equations
33B30	Higher logarithm functions	34A34	Nonlinear equations and systems, general
33B99	None of the above, but in this section	34A35	Differential equations of infinite order
33Cxx	Hypergeometric functions	34A36	Discontinuous equations
33C05	Classical hypergeometric functions, ${}_2F_1$	34A37	Differential equations with impulses
33C10	Bessel and Airy functions, cylinder functions, ${}_0F_1$	34A38	Hybrid systems
33C15	Confluent hypergeometric functions, Whittaker functions, ${}_1F_1$	34A40	Differential inequalities [See also 26D20]
33C20	Generalized hypergeometric series, ${}_pF_q$	34A45	Theoretical approximation of solutions {For numerical analysis, see 65Lxx}
33C45	Orthogonal polynomials and functions of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.) [See also 42C05 for general orthogonal polynomials and functions]	34A55	Inverse problems
33C47	Other special orthogonal polynomials and functions	34A60	Differential inclusions [See also 49J21, 49K21]
33C50	Orthogonal polynomials and functions in several variables expressible in terms of special functions in one variable	34A99	None of the above, but in this section
33C52	Orthogonal polynomials and functions associated with root systems	34Bxx	Boundary value problems {For ordinary differential operators, see 34Lxx}
33C55	Spherical harmonics	34B05	Linear boundary value problems
• 33C60	Hypergeometric integrals and functions defined by them (E, G, H and I functions)	34B07	Linear boundary value problems with nonlinear dependence on the spectral parameter
33C65	Appell, Horn and Lauricella functions	34B08	Parameter dependent boundary value problems
33C67	Hypergeometric functions associated with root systems	34B09	Boundary eigenvalue problems
33C70	Other hypergeometric functions and integrals in several variables	34B10	Nonlocal and multipoint boundary value problems
33C75	Elliptic integrals as hypergeometric functions	34B15	Nonlinear boundary value problems
33C80	Connections with groups and algebras, and related topics	34B16	Singular nonlinear boundary value problems
33C90	Applications	34B18	Positive solutions of nonlinear boundary value problems
33C99	None of the above, but in this section	34B20	Weyl theory and its generalizations
33Dxx	Basic hypergeometric functions	34B24	Sturm-Liouville theory [See also 34Lxx]
33D05	q -gamma functions, q -beta functions and integrals	34B27	Green functions
33D15	Basic hypergeometric functions in one variable, ${}_r\varphi_s$	34B30	Special equations (Mathieu, Hill, Bessel, etc.)
33D45	Basic orthogonal polynomials and functions (Askey-Wilson polynomials, etc.)	34B37	Boundary value problems with impulses
33D50	Orthogonal polynomials and functions in several variables expressible in terms of basic hypergeometric functions in one variable	34B40	Boundary value problems on infinite intervals
33D52	Basic orthogonal polynomials and functions associated with root systems (Macdonald polynomials, etc.)	34B45	Boundary value problems on graphs and networks
33D60	Basic hypergeometric integrals and functions defined by them	34B60	Applications
33D65	Bibasic functions and multiple bases	34B99	None of the above, but in this section
33D67	Basic hypergeometric functions associated with root systems	34Cxx	Qualitative theory [See also 37–XX]
33D70	Other basic hypergeometric functions and integrals in several variables	34C05	Location of integral curves, singular points, limit cycles
33D80	Connections with quantum groups, Chevalley groups, p -adic groups, Hecke algebras, and related topics	34C07	Theory of limit cycles of polynomial and analytic vector fields (existence, uniqueness, bounds, Hilbert's 16th problem and ramifications)
33D90	Applications	34C08	Connections with real algebraic geometry (fewnomials, desingularization, zeros of Abelian integrals, etc.)
33D99	None of the above, but in this section	34C10	Oscillation theory, zeros, disconjugacy and comparison theory
33Exx	Other special functions	34C11	Growth, boundedness
33E05	Elliptic functions and integrals	34C12	Monotone systems
33E10	Lamé, Mathieu, and spheroidal wave functions	34C14	Symmetries, invariants
• 33E12	Mittag-Leffler functions and generalizations	34C15	Nonlinear oscillations, coupled oscillators
33E15	Other wave functions	34C20	Transformation and reduction of equations and systems, normal forms
33E17	Painlevé-type functions	34C23	Bifurcation [See also 37Gxx]
33E20	Other functions defined by series and integrals	34C25	Periodic solutions
33E30	Other functions coming from differential, difference and integral equations	34C26	Relaxation oscillations
33E50	Special functions in characteristic p (gamma functions, etc.)	34C27	Almost and pseudo-almost periodic solutions
33E99	None of the above, but in this section	34C28	Complex behavior, chaotic systems [See also 37Dxx]
33Fxx	Computational aspects	34C29	Averaging method
33F05	Numerical approximation and evaluation [See also 65D20]	34C37	Homoclinic and heteroclinic solutions
33F10	Symbolic computation (Gosper and Zeilberger algorithms, etc.) [See also 68W30]	34C40	Equations and systems on manifolds
33F99	None of the above, but in this section	34C41	Equivalence, asymptotic equivalence
34–XX	ORDINARY DIFFERENTIAL EQUATIONS	34C45	Invariant manifolds
34–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	34C46	Multifrequency systems
34–01	Instructional exposition (textbooks, tutorial papers, etc.)	34C55	Hysteresis
34–02	Research exposition (monographs, survey articles)	34C60	Qualitative investigation and simulation of models
34–03	Historical (must also be assigned at least one classification number from Section 01)	34C99	None of the above, but in this section
34–04	Explicit machine computation and programs (not the theory of computation or programming)	34Dxx	Stability theory [See also 37C75, 93Dxx]
34–06	Proceedings, conferences, collections, etc.	34D05	Asymptotic properties
34Axx	General theory	34D06	Synchronization
34A05	Explicit solutions and reductions	34D08	Characteristic and Lyapunov exponents
34A07	Fuzzy differential equations	34D09	Dichotomy, trichotomy
• 34A08	Fractional differential equations	34D10	Perturbations
34A09	Implicit equations, differential-algebraic equations [See also 65L80]	34D15	Singular perturbations
34A12	Initial value problems, existence, uniqueness, continuous dependence and continuation of solutions	34D20	Stability
		34D23	Global stability
		34D30	Structural stability and analogous concepts [See also 37C20]
		34D35	Stability of manifolds of solutions
		34D45	Attractors [See also 37C70, 37D45]
		34D99	None of the above, but in this section

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34Exx	Asymptotic theory
34E05	Asymptotic expansions
34E10	Perturbations, asymptotics
34E13	Multiple scale methods
34E15	Singular perturbations, general theory
34E17	Canard solutions
34E18	Methods of nonstandard analysis
34E20	Singular perturbations, turning point theory, WKB methods
34E99	None of the above, but in this section
34Fxx	Equations and systems with randomness [See also 34K50 , 60H10 , 93E03]
34F05	Equations and systems with randomness [See also 34K50 , 60H10 , 93E03]
34F10	Bifurcation
34F15	Resonance phenomena
34F99	None of the above, but in this section
34Gxx	Differential equations in abstract spaces [See also 34Lxx , 37Kxx , 47Dxx , 47Hxx , 47Jxx , 58D25]
34G10	Linear equations [See also 47D06 , 47D09]
34G20	Nonlinear equations [See also 47Hxx , 47Jxx]
34G25	Evolution inclusions
34G99	None of the above, but in this section
34Hxx	Control problems [See also 49J15 , 49K15 , 93C15]
34H05	Control problems [See also 49J15 , 49K15 , 93C15]
34H10	Chaos control
34H15	Stabilization
34H20	Bifurcation control
34H99	None of the above, but in this section
34Kxx	Functional-differential and differential-difference equations [See also 37-XX]
34K05	General theory
34K06	Linear functional-differential equations
34K07	Theoretical approximation of solutions
34K08	Spectral theory of functional-differential operators
34K09	Functional-differential inclusions
34K10	Boundary value problems
34K11	Oscillation theory
34K12	Growth, boundedness, comparison of solutions
34K13	Periodic solutions
34K14	Almost and pseudo-periodic solutions
34K17	Transformation and reduction of equations and systems, normal forms
34K18	Bifurcation theory
34K19	Invariant manifolds
34K20	Stability theory
34K21	Stationary solutions
34K23	Complex (chaotic) behavior of solutions
34K25	Asymptotic theory
34K26	Singular perturbations
34K27	Perturbations
34K28	Numerical approximation of solutions
34K29	Inverse problems
34K30	Equations in abstract spaces [See also 34Gxx , 35R09 , 35R10 , 47Jxx]
34K31	Lattice functional-differential equations
34K32	Implicit equations
34K33	Averaging
34K34	Hybrid systems
34K35	Control problems [See also 49J21 , 49K21 , 93C23]
34K36	Fuzzy functional-differential equations
 34K37	Functional-differential equations with fractional derivatives
34K38	Functional-differential inequalities
34K40	Neutral equations
34K45	Equations with impulses
34K50	Stochastic functional-differential equations [See also , 60Hxx]
34K60	Qualitative investigation and simulation of models
34K99	None of the above, but in this section
34Lxx	Ordinary differential operators [See also 47E05]
34L05	General spectral theory
34L10	Eigenfunctions, eigenfunction expansions, completeness of eigenfunctions
34L15	Eigenvalues, estimation of eigenvalues, upper and lower bounds
34L16	Numerical approximation of eigenvalues and of other parts of the spectrum
34L20	Asymptotic distribution of eigenvalues, asymptotic theory of eigenfunctions
34L25	Scattering theory, inverse scattering
34L30	Nonlinear ordinary differential operators
34L40	Particular operators (Dirac, one-dimensional Schrödinger, etc.)
34L99	None of the above, but in this section

34Mxx	Differential equations in the complex domain [See also 30Dxx , 32G34]
34M03	Linear equations and systems
34M05	Entire and meromorphic solutions
34M10	Oscillation, growth of solutions
34M15	Algebraic aspects (differential-algebraic, hypertranscendence, group-theoretical)
34M25	Formal solutions, transform techniques
34M30	Asymptotics, summation methods
34M35	Singularities, monodromy, local behavior of solutions, normal forms
34M40	Stokes phenomena and connection problems (linear and nonlinear)
34M45	Differential equations on complex manifolds
34M50	Inverse problems (Riemann-Hilbert, inverse differential Galois, etc.)
34M55	Painlevé and other special equations; classification, hierarchies;
34M56	Isomonodromic deformations
34M60	Singular perturbation problems in the complex domain (complex WKB, turning points, steepest descent) [See also 34E20]
34M99	None of the above, but in this section
34Nxx	Dynamic equations on time scales or measure chains {For real analysis on time scales see 26E70 }
34N05	Dynamic equations on time scales or measure chains {For real analysis on time scales or measure chains, see 26E70 }
34N99	None of the above, but in this section
35-XX	PARTIAL DIFFERENTIAL EQUATIONS
35-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
35-01	Instructional exposition (textbooks, tutorial papers, etc.)
35-02	Research exposition (monographs, survey articles)
35-03	Historical (must also be assigned at least one classification number from Section 01)
35-04	Explicit machine computation and programs (not the theory of computation or programming)
35-06	Proceedings, conferences, collections, etc.
35Axx	General topics
35A01	Existence problems: global existence, local existence, non-existence
35A02	Uniqueness problems: global uniqueness, local uniqueness, non-uniqueness
35A08	Fundamental solutions
35A09	Classical solutions
35A10	Cauchy-Kovalevskaya theorems
35A15	Variational methods
35A16	Topological and monotonicity methods
35A17	Parametrices
35A18	Wave front sets
35A20	Analytic methods, singularities
35A21	Propagation of singularities
35A22	Transform methods (e.g. integral transforms)
35A23	Inequalities involving derivatives and differential and integral operators, inequalities for integrals
35A24	Methods of ordinary differential equations
35A25	Other special methods
35A27	Microlocal methods; methods of sheaf theory and homological algebra in PDE [See also 32C38 , 58J15]
35A30	Geometric theory, characteristics, transformations [See also 58J70 , 58J72]
35A35	Theoretical approximation to solutions {For numerical analysis, see 65Mxx , 65Nxx }
35A99	None of the above, but in this section
35Bxx	Qualitative properties of solutions
35B05	Oscillation, zeros of solutions, mean value theorems, etc.
35B06	Symmetries, invariants, etc.
35B07	Axially symmetric solutions
35B08	Entire solutions
35B09	Positive solutions
35B10	Periodic solutions
35B15	Almost and pseudo-almost periodic solutions
35B20	Perturbations
35B25	Singular perturbations
35B27	Homogenization; equations in media with periodic structure [See also 74Qxx , 76M50]
35B30	Dependence of solutions on initial and boundary data, parameters [See also 37Cxx]
35B32	Bifurcation [See also 37Gxx , 37K50]
35B33	Critical exponents
35B34	Resonances
35B35	Stability
35B36	Pattern formation
35B38	Critical points
35B40	Asymptotic behavior of solutions
35B41	Attractors

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35B42	Inertial manifolds
35B44	Blow-up
35B45	A priori estimates
35B50	Maximum principles
35B51	Comparison principles
35B53	Liouville theorems, Phragmén-Lindelöf theorems
35B60	Continuation and prolongation of solutions [See also 58A15 , 58A17 , 58Hxx]
35B65	Smoothness and regularity of solutions
35B99	None of the above, but in this section
35Cxx	Representations of solutions
35C05	Solutions in closed form
35C06	Self-similar solutions
35C07	Traveling wave solutions
35C08	Soliton solutions
35C09	Trigonometric solutions
35C10	Series solutions
35C11	Polynomial solutions
35C15	Integral representations of solutions
35C20	Asymptotic expansions
35C99	None of the above, but in this section
35Dxx	Generalized solutions
35D30	Weak solutions
35D35	Strong solutions
35D40	Viscosity solutions
35D99	None of the above, but in this section
35Exx	Equations and systems with constant coefficients [See also 35N05]
35E05	Fundamental solutions
35E10	Convexity properties
35E15	Initial value problems
35E20	General theory
35E99	None of the above, but in this section
35Fxx	General first-order equations and systems
35F05	Linear first-order equations
35F10	Initial value problems for linear first-order equations
35F15	Boundary value problems for linear first-order equations
35F16	Initial-boundary value problems for linear first-order equations
35F20	Nonlinear first-order equations
35F21	Hamilton-Jacobi equations
35F25	Initial value problems for nonlinear first-order equations
35F30	Boundary value problems for nonlinear first-order equations
35F31	Initial-boundary value problems for nonlinear first-order equations
35F35	Linear first-order systems
35F40	Initial value problems for linear first-order systems
35F45	Boundary value problems for linear first-order systems
35F46	Initial-boundary value problems for linear first-order systems
35F50	Nonlinear first-order systems
35F55	Initial value problems for nonlinear first-order systems
35F60	Boundary value problems for nonlinear first-order systems
35F61	Initial-boundary value problems for nonlinear first-order systems
35F99	None of the above, but in this section
35Gxx	General higher-order equations and systems
35G05	Linear higher-order equations
35G10	Initial value problems for linear higher-order equations
35G15	Boundary value problems for linear higher-order equations
35G16	Initial-boundary value problems for linear higher-order equations
35G20	Nonlinear higher-order equations
35G25	Initial value problems for nonlinear higher-order equations
35G30	Boundary value problems for nonlinear higher-order equations
35G31	Initial-boundary value problems for nonlinear higher-order equations
35G35	Linear higher-order systems
35G40	Initial value problems for linear higher-order systems
35G45	Boundary value problems for linear higher-order systems
35G46	Initial-boundary value problems for linear higher-order systems
35G50	Nonlinear higher-order systems
35G55	Initial value problems for nonlinear higher-order systems
35G60	Boundary value problems for nonlinear higher-order systems
35G61	Initial-boundary value problems for nonlinear higher-order systems
35G99	None of the above, but in this section
35Hxx	Close-to-elliptic equations and systems
35H10	Hypoelliptic equations
35H20	Subelliptic equations
35H30	Quasi-elliptic equations
35H99	None of the above, but in this section
35Jxx	Elliptic equations and systems [See also 58J10, 58J20]
35J05	Laplacian operator, reduced wave equation (Helmholtz equation), Poisson equation [See also 31Axx , 31Bxx]
35J08	Green’s functions
35J10	Schrödinger operator [See also 35Pxx]
35J15	Second-order elliptic equations

35J20	Variational methods for second-order elliptic equations
35J25	Boundary value problems for second-order elliptic equations
35J30	Higher-order elliptic equations [See also 31A30 , 31B30]
35J35	Variational methods for higher-order elliptic equations
35J40	Boundary value problems for higher-order elliptic equations
35J46	First-order elliptic systems
35J47	Second-order elliptic systems
35J48	Higher-order elliptic systems
35J50	Variational methods for elliptic systems
35J56	Boundary value problems for first-order elliptic systems
35J57	Boundary value problems for second-order elliptic systems
35J58	Boundary value problems for higher-order elliptic systems
35J60	Nonlinear elliptic equations
35J61	Semilinear elliptic equations
35J62	Quasilinear elliptic equations
35J65	Nonlinear boundary value problems for linear elliptic equations
35J66	Nonlinear boundary value problems for nonlinear elliptic equations
35J67	Boundary values of solutions to elliptic equations
35J70	Degenerate elliptic equations
35J75	Singular elliptic equations
35J86	Linear elliptic unilateral problems and linear elliptic variational inequalities [See also 35R35 , 49J40]
35J87	Nonlinear elliptic unilateral problems and nonlinear elliptic variational inequalities [See also 35R35 , 49J40]
35J88	Systems of elliptic variational inequalities [See also 35R35 , 49J40]
35J91	Semilinear elliptic equations with Laplacian, bi-Laplacian or poly-Laplacian
35J92	Quasilinear elliptic equations with p -Laplacian
35J93	Quasilinear elliptic equations with mean curvature operator
35J96	Elliptic Monge-Ampère equations
35J99	None of the above, but in this section
35Kxx	Parabolic equations and systems [See also 35Bxx, 35Dxx, 35R30, 35R35, 58J35]
35K05	Heat equation
35K08	Heat kernel
35K10	Second-order parabolic equations
35K15	Initial value problems for second-order parabolic equations
35K20	Initial-boundary value problems for second-order parabolic equations
35K25	Higher-order parabolic equations
35K30	Initial value problems for higher-order parabolic equations
35K35	Initial-boundary value problems for higher-order parabolic equations
35K40	Second-order parabolic systems
35K41	Higher-order parabolic systems
35K45	Initial value problems for second-order parabolic systems
35K46	Initial value problems for higher-order parabolic systems
35K51	Initial-boundary value problems for second-order parabolic systems
35K52	Initial-boundary value problems for higher-order parabolic systems
35K55	Nonlinear parabolic equations
35K57	Reaction-diffusion equations
35K58	Semilinear parabolic equations
35K59	Quasilinear parabolic equations
35K60	Nonlinear initial value problems for linear parabolic equations
35K61	Nonlinear initial-boundary value problems for nonlinear parabolic equations
35K65	Degenerate parabolic equations
35K67	Singular parabolic equations
35K70	Ultraparabolic equations, pseudoparabolic equations, etc.
35K85	Linear parabolic unilateral problems and linear parabolic variational inequalities [See also 35R35 , 49J40]
35K86	Nonlinear parabolic unilateral problems and nonlinear parabolic variational inequalities [See also 35R35 , 49J40]
35K87	Systems of parabolic variational inequalities [See also 35R35 , 49J40]
35K90	Abstract parabolic equations
35K91	Semilinear parabolic equations with Laplacian, bi-Laplacian or poly-Laplacian
35K92	Quasilinear parabolic equations with p -Laplacian
35K93	Quasilinear parabolic equations with mean curvature operator
35K96	Parabolic Monge-Ampère equations
35K99	None of the above, but in this section
35Lxx	Hyperbolic equations and systems [See also 58J45]
35L02	First-order hyperbolic equations
35L03	Initial value problems for first-order hyperbolic equations
35L04	Initial-boundary value problems for first-order hyperbolic equations
35L05	Wave equation
35L10	Second-order hyperbolic equations
35L15	Initial value problems for second-order hyperbolic equations
35L20	Initial-boundary value problems for second-order hyperbolic equations
35L25	Higher-order hyperbolic equations
35L30	Initial value problems for higher-order hyperbolic equations

35L35	Initial-boundary value problems for higher-order hyperbolic equations	35Q62	PDEs in connection with statistics
35L40	First-order hyperbolic systems	35Q68	PDEs in connection with computer science
35L45	Initial value problems for first-order hyperbolic systems	35Q70	PDEs in connection with mechanics of particles and systems
35L50	Initial-boundary value problems for first-order hyperbolic systems	35Q74	PDEs in connection with mechanics of deformable solids
35L51	Second-order hyperbolic systems	35Q75	PDEs in connection with relativity and gravitational theory
35L52	Initial value problems for second-order hyperbolic systems	35Q76	Einstein equations
35L53	Initial-boundary value problems for second-order hyperbolic systems	35Q80	PDEs in connection with classical thermodynamics and heat transfer
35L55	Higher-order hyperbolic systems	35Q82	PDEs in connection with statistical mechanics
35L56	Initial value problems for higher-order hyperbolic systems	35Q83	Vlasov-like equations
35L57	Initial-boundary value problems for higher-order hyperbolic systems	35Q84	Fokker-Planck equations
35L60	Nonlinear first-order hyperbolic equations	35Q85	PDEs in connection with astronomy and astrophysics
35L65	Conservation laws	35Q86	PDEs in connection with geophysics
35L67	Shocks and singularities [See also 58Kxx , 76L05]	35Q90	PDEs in connection with mathematical programming
35L70	Nonlinear second-order hyperbolic equations	35Q91	PDEs in connection with game theory, economics, social and behavioral sciences
35L71	Semilinear second-order hyperbolic equations	35Q92	PDEs in connection with biology and other natural sciences
35L72	Quasilinear second-order hyperbolic equations	35Q93	PDEs in connection with control and optimization
35L75	Nonlinear higher-order hyperbolic equations	35Q94	PDEs in connection with information and communication
35L76	Semilinear higher-order hyperbolic equations	35Q99	None of the above, but in this section
35L77	Quasilinear higher-order hyperbolic equations	35Rxx	Miscellaneous topics {For equations on manifolds, see 58Jxx; for manifolds of solutions, see 58Bxx; for stochastic PDE, see also 60H15}
35L80	Degenerate hyperbolic equations	35R01	Partial differential equations on manifolds [See also 32Wxx , 53Cxx , 58Jxx]
35L81	Singular hyperbolic equations	35R02	Partial differential equations on graphs and networks (ramified or polygonal spaces)
35L82	Pseudohyperbolic equations	35R03	Partial differential equations on Heisenberg groups, Lie groups, Carnot groups, etc.
35L85	Linear hyperbolic unilateral problems and linear hyperbolic variational inequalities [See also 35R35 , 49J40]	35R05	Partial differential equations with discontinuous coefficients or data
35L86	Nonlinear hyperbolic unilateral problems and nonlinear hyperbolic variational inequalities [See also 35R35 , 49J40]	35R06	Partial differential equations with measure
35L87	Unilateral problems and variational inequalities for hyperbolic systems [See also 35R35 , 49J40]	35R09	Integro-partial differential equations [See also 45Kxx]
35L90	Abstract hyperbolic equations	35R10	Partial functional-differential equations
35L99	None of the above, but in this section	 35R11	Fractional partial differential equations
35Mxx	Equations and systems of special type (mixed, composite, etc.)	35R12	Impulsive partial differential equations
35M10	Equations of mixed type	35R13	Fuzzy partial differential equations
35M11	Initial value problems for equations of mixed type	35R15	Partial differential equations on infinite-dimensional (e.g. function) spaces (= PDE in infinitely many variables) [See also 46Gxx , 58D25]
35M12	Boundary value problems for equations of mixed type	35R20	Partial operator-differential equations (i.e., PDE on finite-dimensional spaces for abstract space valued functions) [See also 34Gxx , 47A50 , 47D03 , 47D06 , 47D09 , 47H20 , 47Jxx]
35M13	Initial-boundary value problems for equations of mixed type	35R25	Improperly posed problems
35M30	Systems of mixed type	35R30	Inverse problems
35M31	Initial value problems for systems of mixed type	35R35	Free boundary problems
35M32	Boundary value problems for systems of mixed type	35R37	Moving boundary problems
35M33	Initial-boundary value problems for systems of mixed type	35R45	Partial differential inequalities
35M85	Linear unilateral problems and variational inequalities of mixed type [See also 35R35 , 49J40]	35R50	Partial differential equations of infinite order
35M86	Nonlinear unilateral problems and nonlinear variational inequalities of mixed type [See also 35R35 , 49J40]	35R60	Partial differential equations with randomness, stochastic partial differential equations [See also 60H15]
35M87	Systems of variational inequalities of mixed type [See also 35R35 , 49J40]	35R70	Partial differential equations with multivalued right-hand sides
35M99	None of the above, but in this section	35R99	None of the above, but in this section
35Nxx	Overdetermined systems [See also 58Hxx, 58J10, 58J15]	35Sxx	Pseudodifferential operators and other generalizations of partial differential operators [See also 47G30, 58J40]
35N05	Overdetermined systems with constant coefficients	35S05	Pseudodifferential operators
35N10	Overdetermined systems with variable coefficients	35S10	Initial value problems for pseudodifferential operators
35N15	$\bar{\partial}$ -Neumann problem and generalizations; formal complexes [See also 32W05 , 32W10 , 58J10]	35S11	Initial-boundary value problems for pseudodifferential operators
35N20	Overdetermined initial value problems	35S15	Boundary value problems for pseudodifferential operators
35N25	Overdetermined boundary value problems	35S30	Fourier integral operators
35N30	Overdetermined initial-boundary value problems	35S35	Topological aspects: intersection cohomology, stratified sets, etc. [See also 32C38 , 32S40 , 32S60 , 58J15]
35N99	None of the above, but in this section	35S50	Paradifferential operators
35Pxx	Spectral theory and eigenvalue problems [See also 47Axx, 47Bxx, 47F05]	35S99	None of the above, but in this section
35P05	General topics in linear spectral theory	37-XX	DYNAMICAL SYSTEMS AND ERGODIC THEORY [See also 26A18, 28Dxx, 34Cxx, 34Dxx, 35Bxx, 46Lxx, 58Jxx, 70-XX]
35P10	Completeness of eigenfunctions, eigenfunction expansions	37-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
35P15	Estimation of eigenvalues, upper and lower bounds	37-01	Instructional exposition (textbooks, tutorial papers, etc.)
35P20	Asymptotic distribution of eigenvalues and eigenfunctions	37-02	Research exposition (monographs, survey articles)
35P25	Scattering theory [See also 47A40]	37-03	Historical (must also be assigned at least one classification number from Section 01)
35P30	Nonlinear eigenvalue problems, nonlinear spectral theory	37-04	Explicit machine computation and programs (not the theory of computation or programming)
35P99	None of the above, but in this section	37-06	Proceedings, conferences, collections, etc.
35Qxx	Equations of mathematical physics and other areas of application [See also 35J05, 35J10, 35K05, 35L05]	37Axx	Ergodic theory [See also 28Dxx]
35Q05	Euler-Poisson-Darboux equations	37A05	Measure-preserving transformations
35Q15	Riemann-Hilbert problems [See also 30E25 , 31A25 , 31B20]	37A10	One-parameter continuous families of measure-preserving transformations
35Q20	Boltzmann equations	37A15	General groups of measure-preserving transformations [See mainly 22Fxx]
35Q30	Navier-Stokes equations [See also 76D05 , 76D07 , 76N10]	37A17	Homogeneous flows [See also 22Fxx]
35Q31	Euler equations [See also 76D05 , 76D07 , 76N10]		
35Q35	PDEs in connection with fluid mechanics		
35Q40	PDEs in connection with quantum mechanics		
35Q41	Time-dependent Schrödinger equations, Dirac equations		
35Q51	Soliton-like equations [See also 37K40]		
35Q53	KdV-like equations (Korteweg-de Vries) [See also 37K10]		
35Q55	NLS-like equations (nonlinear Schrödinger) [See also 37K10]		
35Q56	Ginzburg-Landau equations		
35Q60	PDEs in connection with optics and electromagnetic theory		
35Q61	Maxwell equations		

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37A20	Orbit equivalence, cocycles, ergodic equivalence relations	37Fxx	Complex dynamical systems [See also 30D05, 32H50]
37A25	Ergodicity, mixing, rates of mixing	37F05	Relations and correspondences
37A30	Ergodic theorems, spectral theory, Markov operators {For operator ergodic theory, see mainly 47A35}	37F10	Polynomials; rational maps; entire and meromorphic functions [See also 32A10, 32A20, 32H02, 32H04]
37A35	Entropy and other invariants, isomorphism, classification	37F15	Expanding maps; hyperbolicity; structural stability
37A40	Nonsingular (and infinite-measure preserving) transformations	37F20	Combinatorics and topology
37A45	Relations with number theory and harmonic analysis [See also 11Kxx]	37F25	Renormalization
37A50	Relations with probability theory and stochastic processes [See also 60Fxx and 60G10]	37F30	Quasiconformal methods and Teichmüller theory; Fuchsian and Kleinian groups as dynamical systems
37A55	Relations with the theory of C^* -algebras [See mainly 46L55]	37F35	Conformal densities and Hausdorff dimension
37A60	Dynamical systems in statistical mechanics [See also 82Cxx]	37F40	Geometric limits
37A99	None of the above, but in this section	37F45	Holomorphic families of dynamical systems; the Mandelbrot set; bifurcations
37Bxx	Topological dynamics [See also 54H20]	37F50	Small divisors, rotation domains and linearization; Fatou and Julia sets
37B05	Transformations and group actions with special properties (minimality, distality, proximality, etc.)	37F75	Holomorphic foliations and vector fields [See also 32M25, 32S65, 34Mxx]
37B10	Symbolic dynamics [See also 37Cxx, 37Dxx]	37F99	None of the above, but in this section
37B15	Cellular automata [See also 68Q80]	37Gxx	Local and nonlocal bifurcation theory [See also 34C23, 34K18]
37B20	Notions of recurrence	37G05	Normal forms
37B25	Lyapunov functions and stability; attractors, repellers	37G10	Bifurcations of singular points
37B30	Index theory, Morse-Conley indices	37G15	Bifurcations of limit cycles and periodic orbits
37B35	Gradient-like and recurrent behavior; isolated (locally maximal) invariant sets	37G20	Hyperbolic singular points with homoclinic trajectories
37B40	Topological entropy	37G25	Bifurcations connected with nontransversal intersection
37B45	Continua theory in dynamics	37G30	Infinite nonwandering sets arising in bifurcations
37B50	Multi-dimensional shifts of finite type, tiling dynamics	37G35	Attractors and their bifurcations
37B55	Nonautonomous dynamical systems	37G40	Symmetries, equivariant bifurcation theory
37B99	None of the above, but in this section	37G99	None of the above, but in this section
37Cxx	Smooth dynamical systems: general theory [See also 34Cxx, 34Dxx]	37Hxx	Random dynamical systems [See also 15B52, 34D08, 34F05, 47B80, 70L05, 82C05, 93Exx]
37C05	Smooth mappings and diffeomorphisms	37H05	Foundations, general theory of cocycles, algebraic ergodic theory [See also 37Axx]
37C10	Vector fields, flows, ordinary differential equations	37H10	Generation, random and stochastic difference and differential equations [See also 34F05, 34K50, 60H10, 60H15]
37C15	Topological and differentiable equivalence, conjugacy, invariants, moduli, classification	37H15	Multiplicative ergodic theory, Lyapunov exponents [See also 34D08, 37Axx, 37Cxx, 37Dxx]
37C20	Generic properties, structural stability	37H20	Bifurcation theory [See also 37Gxx]
37C25	Fixed points, periodic points, fixed-point index theory	37H99	None of the above, but in this section
37C27	Periodic orbits of vector fields and flows	37Jxx	Finite-dimensional Hamiltonian, Lagrangian, contact, and nonholonomic systems [See also 53Dxx, 70Fxx, 70Hxx]
37C29	Homoclinic and heteroclinic orbits	37J05	General theory, relations with symplectic geometry and topology
37C30	Zeta functions, (Ruelle-Frobenius) transfer operators, and other functional analytic techniques in dynamical systems	37J10	Symplectic mappings, fixed points
37C35	Orbit growth	37J15	Symmetries, invariants, invariant manifolds, momentum maps, reduction [See also 53D20]
37C40	Smooth ergodic theory, invariant measures [See also 37Dxx]	37J20	Bifurcation problems
37C45	Dimension theory of dynamical systems	37J25	Stability problems
37C50	Approximate trajectories (pseudotrajectories, shadowing, etc.)	37J30	Obstructions to integrability (nonintegrability criteria)
37C55	Periodic and quasiperiodic flows and diffeomorphisms	37J35	Completely integrable systems, topological structure of phase space, integration methods
37C60	Nonautonomous smooth dynamical systems [See also 37B55]	37J40	Perturbations, normal forms, small divisors, KAM theory, Arnol'd diffusion
37C65	Monotone flows	37J45	Periodic, homoclinic and heteroclinic orbits; variational methods, degree-theoretic methods
37C70	Attractors and repellers, topological structure	37J50	Action-minimizing orbits and measures
37C75	Stability theory	37J55	Contact systems [See also 53D10]
37C80	Symmetries, equivariant dynamical systems	37J60	Nonholonomic dynamical systems [See also 70F25]
37C85	Dynamics of group actions other than Z and R , and foliations [See mainly 22Fxx, and also 57R30, 57Sxx]	37J99	None of the above, but in this section
37C99	None of the above, but in this section	37Kxx	Infinite-dimensional Hamiltonian systems [See also 35Axx, 35Qxx]
37Dxx	Dynamical systems with hyperbolic behavior	37K05	Hamiltonian structures, symmetries, variational principles, conservation laws
37D05	Hyperbolic orbits and sets	37K10	Completely integrable systems, integrability tests, bi-Hamiltonian structures, hierarchies (KdV, KP, Toda, etc.)
37D10	Invariant manifold theory	37K15	Integration of completely integrable systems by inverse spectral and scattering methods
37D15	Morse-Smale systems	37K20	Relations with algebraic geometry, complex analysis, special functions [See also 14H70]
37D20	Uniformly hyperbolic systems (expanding, Anosov, Axiom A, etc.)	37K25	Relations with differential geometry
37D25	Nonuniformly hyperbolic systems (Lyapunov exponents, Pesin theory, etc.)	37K30	Relations with infinite-dimensional Lie algebras and other algebraic structures
37D30	Partially hyperbolic systems and dominated splittings	37K35	Lie-Bäcklund and other transformations
37D35	Thermodynamic formalism, variational principles, equilibrium states	37K40	Soliton theory, asymptotic behavior of solutions
37D40	Dynamical systems of geometric origin and hyperbolicity (geodesic and horocycle flows, etc.)	37K45	Stability problems
37D45	Strange attractors, chaotic dynamics	37K50	Bifurcation problems
37D50	Hyperbolic systems with singularities (billiards, etc.)	37K55	Perturbations, KAM for infinite-dimensional systems
37D99	None of the above, but in this section	37K60	Lattice dynamics [See also 37L60]
37Exx	Low-dimensional dynamical systems	37K65	Hamiltonian systems on groups of diffeomorphisms and on manifolds of mappings and metrics
37E05	Maps of the interval (piecewise continuous, continuous, smooth)	37K99	None of the above, but in this section
37E10	Maps of the circle		
37E15	Combinatorial dynamics (types of periodic orbits)		
37E20	Universality, renormalization [See also 37F25]		
37E25	Maps of trees and graphs		
37E30	Homeomorphisms and diffeomorphisms of planes and surfaces		
37E35	Flows on surfaces		
37E40	Twist maps		
37E45	Rotation numbers and vectors		
37E99	None of the above, but in this section		

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37Lxx	Infinite-dimensional dissipative dynamical systems [See also 35Bxx , 35Qxx]	39A30	Stability theory
37L05	General theory, nonlinear semigroups, evolution equations	39A33	Complex (chaotic) behavior of solutions
37L10	Normal forms, center manifold theory, bifurcation theory	39A45	Equations in the complex domain
37L15	Stability problems	39A50	Stochastic difference equations
37L20	Symmetries	39A60	Applications
37L25	Inertial manifolds and other invariant attracting sets	39A70	Difference operators [See also 47B39]
37L30	Attractors and their dimensions, Lyapunov exponents	39A99	None of the above, but in this section
37L40	Invariant measures	39Bxx	Functional equations and inequalities [See also 30D05]
37L45	Hyperbolicity; Lyapunov functions	39B05	General
37L50	Noncompact semigroups; dispersive equations; perturbations of Hamiltonian systems	39B12	Iteration theory, iterative and composite equations [See also 26A18 , 30D05 , 37–XX]
37L55	Infinite-dimensional random dynamical systems; stochastic equations [See also 35R60 , 60H10 , 60H15]	39B22	Equations for real functions [See also 26A51 , 26B25]
37L60	Lattice dynamics [See also 37K60]	39B32	Equations for complex functions [See also 30D05]
37L65	Special approximation methods (nonlinear Galerkin, etc.)	39B42	Matrix and operator equations [See also 47Jxx]
37L99	None of the above, but in this section	39B52	Equations for functions with more general domains and/or ranges
37Mxx	Approximation methods and numerical treatment of dynamical systems [See also 65Pxx]	39B55	Orthogonal additivity and other conditional equations
37M05	Simulation	39B62	Functional inequalities, including subadditivity, convexity, etc. [See also 26A51 , 26B25 , 26Dxx]
37M10	Time series analysis	39B72	Systems of functional equations and inequalities
37M15	Symplectic integrators	39B82	Stability, separation, extension, and related topics [See also 46A22]
37M20	Computational methods for bifurcation problems	39B99	None of the above, but in this section
37M25	Computational methods for ergodic theory (approximation of invariant measures, computation of Lyapunov exponents, entropy)	40–XX	SEQUENCES, SERIES, SUMMABILITY
37M99	None of the above, but in this section	40–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
37Nxx	Applications	40–01	Instructional exposition (textbooks, tutorial papers, etc.)
37N05	Dynamical systems in classical and celestial mechanics [See mainly 70Fxx , 70Hxx , 70Kxx]	40–02	Research exposition (monographs, survey articles)
37N10	Dynamical systems in fluid mechanics, oceanography and meteorology [See mainly 76–XX , especially 76D05 , 76F20 , 86A05 , 86A10]	40–03	Historical (must also be assigned at least one classification number from Section 01)
37N15	Dynamical systems in solid mechanics [See mainly 74Hxx]	40–04	Explicit machine computation and programs (not the theory of computation or programming)
37N20	Dynamical systems in other branches of physics (quantum mechanics, general relativity, laser physics)	40–06	Proceedings, conferences, collections, etc.
37N25	Dynamical systems in biology [See mainly 92–XX , but also 91–XX]	40Axx	Convergence and divergence of infinite limiting processes
37N30	Dynamical systems in numerical analysis	40A05	Convergence and divergence of series and sequences
37N35	Dynamical systems in control	40A10	Convergence and divergence of integrals
37N40	Dynamical systems in optimization and economics	40A15	Convergence and divergence of continued fractions [See also 30B70]
37N99	None of the above, but in this section	40A20	Convergence and divergence of infinite products
37Pxx	Arithmetic and non-Archimedean dynamical systems [See also 11S82 , 37A45]	40A25	Approximation to limiting values (summation of series, etc.) {For the Euler-Maclaurin summation formula, see 65B15 }
37P05	Polynomial and rational maps	40A30	Convergence and divergence of series and sequences of functions
37P10	Analytic and meromorphic maps	40A35	Ideal and statistical convergence [See also 40G15]
37P15	Global ground fields	40A99	None of the above, but in this section
37P20	Non-Archimedean local ground fields	40Bxx	Multiple sequences and series
37P25	Finite ground fields	40B05	Multiple sequences and series (should also be assigned at least one other classification number in this section)
37P30	Height functions; Green functions; invariant measures [See also 11G50 , 14G40]	40B99	None of the above, but in this section
37P35	Arithmetic properties of periodic points	40Cxx	General summability methods
37P40	Non-Archimedean Fatou and Julia sets	40C05	Matrix methods
37P45	Families and moduli spaces	40C10	Integral methods
37P50	Dynamical systems on Berkovich spaces	40C15	Function-theoretic methods (including power series methods and semicontinuous methods)
37P55	Arithmetic dynamics on general algebraic varieties	40C99	None of the above, but in this section
37P99	None of the above, but in this section	40Dxx	Direct theorems on summability
39–XX	DIFFERENCE AND FUNCTIONAL EQUATIONS	40D05	General theorems
39–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	40D09	Structure of summability fields
39–01	Instructional exposition (textbooks, tutorial papers, etc.)	40D10	Tauberian constants and oscillation limits
39–02	Research exposition (monographs, survey articles)	40D15	Convergence factors and summability factors
39–03	Historical (must also be assigned at least one classification number from Section 01)	40D20	Summability and bounded fields of methods
39–04	Explicit machine computation and programs (not the theory of computation or programming)	40D25	Inclusion and equivalence theorems
39–06	Proceedings, conferences, collections, etc.	40D99	None of the above, but in this section
39Axx	Difference equations {For dynamical systems, see 37–XX ; for dynamic equations on time scales, see 34N05 }	40Exx	Inversion theorems
39A05	General theory	40E05	Tauberian theorems, general
39A06	Linear equations	40E10	Growth estimates
39A10	Difference equations, additive	40E15	Lacunary inversion theorems
39A12	Discrete version of topics in analysis	40E20	Tauberian constants
39A13	Difference equations, scaling (q -differences) [See also 33Dxx]	40E99	None of the above, but in this section
39A14	Partial difference equations	40Fxx	Absolute and strong summability (should also be assigned at least one other classification number in Section 40)
39A20	Multiplicative and other generalized difference equations, e.g. of Lyness type	40F05	Absolute and strong summability (should also be assigned at least one other classification number in Section 40)
39A21	Oscillation theory	40F99	None of the above, but in this section
39A22	Growth, boundedness, comparison of solutions	40Gxx	Special methods of summability
39A23	Periodic solutions	40G05	Cesàro, Euler, Nörlund and Hausdorff methods
39A24	Almost periodic solutions	40G10	Abel, Borel and power series methods
39A28	Bifurcation theory	40G15	Summability methods using statistical convergence [See also 40A35]
		40G99	None of the above, but in this section
		40Hxx	Functional analytic methods in summability
		40H05	Functional analytic methods in summability
		40H99	None of the above, but in this section

40Jxx	Summability in abstract structures [See also 43A55, 46A35, 46B15]	42A50	Conjugate functions, conjugate series, singular integrals
40J05	Summability in abstract structures [See also 43A55, 46A35, 46B15] (should also be assigned at least one other classification number in this section)	42A55	Lacunary series of trigonometric and other functions; Riesz products
40J99	None of the above, but in this section	42A61	Probabilistic methods
41–XX	APPROXIMATIONS AND EXPANSIONS {For all approximation theory in the complex domain, see 30E05 and 30E10; for all trigonometric approximation and interpolation, see 42A10 and 42A15; for numerical approximation, see 65Dxx}	42A63	Uniqueness of trigonometric expansions, uniqueness of Fourier expansions, Riemann theory, localization
41–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	42A65	Completeness of sets of functions
41–01	Instructional exposition (textbooks, tutorial papers, etc.)	42A70	Trigonometric moment problems
41–02	Research exposition (monographs, survey articles)	42A75	Classical almost periodic functions, mean periodic functions [See also 43A60]
41–03	Historical (must also be assigned at least one classification number from Section 01)	42A82	Positive definite functions
41–04	Explicit machine computation and programs (not the theory of computation or programming)	42A85	Convolution, factorization
41–06	Proceedings, conferences, collections, etc.	42A99	None of the above, but in this section
41Axx	Approximations and expansions {For all approximation theory in the complex domain, see 30E05 and 30E10; for all trigonometric approximation and interpolation, see 42A10 and 42A15; for numerical approximation, see 65Dxx}	42Bxx	Harmonic analysis in several variables {For automorphic theory, see mainly 11F30}
41A05	Interpolation [See also 42A15 and 65D05]	42B05	Fourier series and coefficients
41A10	Approximation by polynomials {For approximation by trigonometric polynomials, see 42A10}	42B08	Summability
41A15	Spline approximation	42B10	Fourier and Fourier-Stieltjes transforms and other transforms of Fourier type
41A17	Inequalities in approximation (Bernstein, Jackson, Nikol’skiĭ-type inequalities)	42B15	Multipliers
41A20	Approximation by rational functions	42B20	Singular and oscillatory integrals (Calderón-Zygmund, etc.)
41A21	Padé approximation	42B25	Maximal functions, Littlewood-Paley theory
41A25	Rate of convergence, degree of approximation	42B30	H^p -spaces
41A27	Inverse theorems	42B35	Function spaces arising in harmonic analysis
41A28	Simultaneous approximation	42B37	Harmonic analysis and PDE [See also 35–XX]
41A29	Approximation with constraints	42B99	None of the above, but in this section
41A30	Approximation by other special function classes	42Cxx	Nontrigonometric harmonic analysis
41A35	Approximation by operators (in particular, by integral operators)	42C05	Orthogonal functions and polynomials, general theory [See also 33C45, 33C50, 33D45]
41A36	Approximation by positive operators	42C10	Fourier series in special orthogonal functions (Legendre polynomials, Walsh functions, etc.)
41A40	Saturation	42C15	General harmonic expansions, frames
41A44	Best constants	42C20	Other transformations of harmonic type
41A45	Approximation by arbitrary linear expressions	42C25	Uniqueness and localization for orthogonal series
41A46	Approximation by arbitrary nonlinear expressions; widths and entropy	42C30	Completeness of sets of functions
41A50	Best approximation, Chebyshev systems	42C40	Wavelets and other special systems
41A52	Uniqueness of best approximation	42C99	None of the above, but in this section
41A55	Approximate quadratures	43–XX	ABSTRACT HARMONIC ANALYSIS {For other analysis on topological and Lie groups, see 22Exx}
41A58	Series expansions (e.g. Taylor, Lidstone series, but not Fourier series)	43–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
41A60	Asymptotic approximations, asymptotic expansions (steepest descent, etc.) [See also 30E15]	43–01	Instructional exposition (textbooks, tutorial papers, etc.)
41A63	Multidimensional problems (should also be assigned at least one other classification number in this section)	43–02	Research exposition (monographs, survey articles)
41A65	Abstract approximation theory (approximation in normed linear spaces and other abstract spaces)	43–03	Historical (must also be assigned at least one classification number from Section 01)
41A80	Remainders in approximation formulas	43–04	Explicit machine computation and programs (not the theory of computation or programming)
41A99	None of the above, but in this section	43–06	Proceedings, conferences, collections, etc.
42–XX	HARMONIC ANALYSIS ON EUCLIDEAN SPACES	43Axx	Abstract harmonic analysis {For other analysis on topological and Lie groups, see 22Exx}
42–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	43A05	Measures on groups and semigroups, etc.
42–01	Instructional exposition (textbooks, tutorial papers, etc.)	43A07	Means on groups, semigroups, etc.; amenable groups
42–02	Research exposition (monographs, survey articles)	43A10	Measure algebras on groups, semigroups, etc.
42–03	Historical (must also be assigned at least one classification number from Section 01)	43A15	L^p -spaces and other function spaces on groups, semigroups, etc.
42–04	Explicit machine computation and programs (not the theory of computation or programming)	43A17	Analysis on ordered groups, H^p -theory
42–06	Proceedings, conferences, collections, etc.	43A20	L^1 -algebras on groups, semigroups, etc.
42Axx	Harmonic analysis in one variable	43A22	Homomorphisms and multipliers of function spaces on groups, semigroups, etc.
42A05	Trigonometric polynomials, inequalities, extremal problems	43A25	Fourier and Fourier-Stieltjes transforms on locally compact and other abelian groups
42A10	Trigonometric approximation	43A30	Fourier and Fourier-Stieltjes transforms on nonabelian groups and on semigroups, etc.
42A15	Trigonometric interpolation	43A32	Other transforms and operators of Fourier type
42A16	Fourier coefficients, Fourier series of functions with special properties, special Fourier series {For automorphic theory, see mainly 11F30}	43A35	Positive definite functions on groups, semigroups, etc.
42A20	Convergence and absolute convergence of Fourier and trigonometric series	43A40	Character groups and dual objects
42A24	Summability and absolute summability of Fourier and trigonometric series	43A45	Spectral synthesis on groups, semigroups, etc.
42A32	Trigonometric series of special types (positive coefficients, monotonic coefficients, etc.)	43A46	Special sets (thin sets, Kronecker sets, Helson sets, Ditkin sets, Sidon sets, etc.)
42A38	Fourier and Fourier-Stieltjes transforms and other transforms of Fourier type	43A50	Convergence of Fourier series and of inverse transforms
42A45	Multipliers	43A55	Summability methods on groups, semigroups, etc. [See also 40J05]
		43A60	Almost periodic functions on groups and semigroups and their generalizations (recurrent functions, distal functions, etc.); almost automorphic functions
		43A62	Hypergroups
		43A65	Representations of groups, semigroups, etc. [See also 22A10, 22A20, 22Dxx, 22E45]
		43A70	Analysis on specific locally compact and other abelian groups [See also 11R56, 22B05]
		43A75	Analysis on specific compact groups
		43A77	Analysis on general compact groups
		43A80	Analysis on other specific Lie groups [See also 22Exx]

43A85	Analysis on homogeneous spaces
43A90	Spherical functions [See also 22E45, 22E46, 33C55]
43A95	Categorical methods [See also 46Mxx]
43A99	None of the above, but in this section
44-XX	INTEGRAL TRANSFORMS, OPERATIONAL CALCULUS
🚫	{For fractional derivatives and integrals, see 26A33. For Fourier transforms, see 42A38, 42B10. For integral transforms in distribution spaces, see 46F12. For numerical methods, see 65R10}
44-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
44-01	Instructional exposition (textbooks, tutorial papers, etc.)
44-02	Research exposition (monographs, survey articles)
44-03	Historical (must also be assigned at least one classification number from Section 01)
44-04	Explicit machine computation and programs (not the theory of computation or programming)
44-06	Proceedings, conferences, collections, etc.
44Axx	Integral transforms, operational calculus {For fractional derivatives and integrals, see 26A33. For Fourier transforms, see 42A38, 42B10. For integral transforms in distribution spaces, see 46F12. For numerical methods, see 65R10}
44A05	General transforms [See also 42A38]
44A10	Laplace transform
44A12	Radon transform [See also 92C55]
44A15	Special transforms (Legendre, Hilbert, etc.)
🚫	44A20 Transforms of special functions
44A30	Multiple transforms
44A35	Convolution
🚫	44A40 Calculus of Mikusiński and other operational calculi
44A45	Classical operational calculus
44A55	Discrete operational calculus
44A60	Moment problems
44A99	None of the above, but in this section
45-XX	INTEGRAL EQUATIONS
45-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
45-01	Instructional exposition (textbooks, tutorial papers, etc.)
45-02	Research exposition (monographs, survey articles)
45-03	Historical (must also be assigned at least one classification number from Section 01)
45-04	Explicit machine computation and programs (not the theory of computation or programming)
45-06	Proceedings, conferences, collections, etc.
45Axx	Linear integral equations
45A05	Linear integral equations
45A99	None of the above, but in this section
45Bxx	Fredholm integral equations
45B05	Fredholm integral equations
45B99	None of the above, but in this section
45Cxx	Eigenvalue problems [See also 34Lxx, 35Pxx, 45P05, 47A75]
45C05	Eigenvalue problems [See also 34Lxx, 35Pxx, 45P05, 47A75]
45C99	None of the above, but in this section
45Dxx	Volterra integral equations [See also 34A12]
45D05	Volterra integral equations [See also 34A12]
45D99	None of the above, but in this section
45Exx	Singular integral equations [See also 30E20, 30E25, 44A15, 44A35]
45E05	Integral equations with kernels of Cauchy type [See also 35J15]
45E10	Integral equations of the convolution type (Abel, Picard, Toeplitz and Wiener-Hopf type) [See also 47B35]
45E99	None of the above, but in this section
45Fxx	Systems of linear integral equations
45F05	Systems of nonsingular linear integral equations
45F10	Dual, triple, etc., integral and series equations
45F15	Systems of singular linear integral equations
45F99	None of the above, but in this section
45Gxx	Nonlinear integral equations [See also 47H30, 47Jxx]
45G05	Singular nonlinear integral equations
45G10	Other nonlinear integral equations
45G15	Systems of nonlinear integral equations
45G99	None of the above, but in this section
45Hxx	Miscellaneous special kernels [See also 44A15]
45H05	Miscellaneous special kernels [See also 44A15]
45H99	None of the above, but in this section
45Jxx	Integro-ordinary differential equations [See also 34K05, 34K30, 47G20]
45J05	Integro-ordinary differential equations [See also 34K05, 34K30, 47G20]
45J99	None of the above, but in this section

45Kxx	Integro-partial differential equations [See also 34K30, 35R09, 35R10, 47G20]
45K05	Integro-partial differential equations [See also 34K30, 35R09, 35R10, 47G20]
45K99	None of the above, but in this section
45Lxx	Theoretical approximation of solutions {For numerical analysis, see 65Rxx}
45L05	Theoretical approximation of solutions {For numerical analysis, see 65Rxx}
45L99	None of the above, but in this section
45Mxx	Qualitative behavior
45M05	Asymptotics
45M10	Stability theory
45M15	Periodic solutions
45M20	Positive solutions
45M99	None of the above, but in this section
45Nxx	Abstract integral equations, integral equations in abstract spaces
45N05	Abstract integral equations, integral equations in abstract spaces
45N99	None of the above, but in this section
45Pxx	Integral operators [See also 47B38, 47G10]
45P05	Integral operators [See also 47B38, 47G10]
45P99	None of the above, but in this section
45Qxx	Inverse problems
45Q05	Inverse problems
45Q99	None of the above, but in this section
45Rxx	Random integral equations [See also 60H20]
45R05	Random integral equations [See also 60H20]
45R99	None of the above, but in this section
46-XX	FUNCTIONAL ANALYSIS {For manifolds modeled on topological linear spaces, see 57Nxx, 58Bxx}
46-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
46-01	Instructional exposition (textbooks, tutorial papers, etc.)
46-02	Research exposition (monographs, survey articles)
46-03	Historical (must also be assigned at least one classification number from Section 01)
46-04	Explicit machine computation and programs (not the theory of computation or programming)
46-06	Proceedings, conferences, collections, etc.
46Axx	Topological linear spaces and related structures {For function spaces, see 46Exx}
46A03	General theory of locally convex spaces
46A04	Locally convex Fréchet spaces and (DF)-spaces
46A08	Barrelled spaces, bornological spaces
46A11	Spaces determined by compactness or summability properties (nuclear spaces, Schwartz spaces, Montel spaces, etc.)
46A13	Spaces defined by inductive or projective limits (LB, LF, etc.) [See also 46M40]
46A16	Not locally convex spaces (metrizable topological linear spaces, locally bounded spaces, quasi-Banach spaces, etc.)
46A17	Bornologies and related structures; Mackey convergence, etc.
46A19	Other “topological” linear spaces (convergence spaces, ranked spaces, spaces with a metric taking values in an ordered structure more general than R , etc.)
46A20	Duality theory
46A22	Theorems of Hahn-Banach type; extension and lifting of functionals and operators [See also 46M10]
46A25	Reflexivity and semi-reflexivity [See also 46B10]
46A30	Open mapping and closed graph theorems; completeness (including B_- , B_+ -completeness)
46A32	Spaces of linear operators; topological tensor products; approximation properties [See also 46B28, 46M05, 47L05, 47L20]
46A35	Summability and bases [See also 46B15]
46A40	Ordered topological linear spaces, vector lattices [See also 06F20, 46B40, 46B42]
46A45	Sequence spaces (including Köthe sequence spaces) [See also 46B45]
46A50	Compactness in topological linear spaces; angelic spaces, etc.
46A55	Convex sets in topological linear spaces; Choquet theory [See also 52A07]
46A61	Graded Fréchet spaces and tame operators
46A63	Topological invariants ((DN), (Ω) , etc.)
46A70	Saks spaces and their duals (strict topologies, mixed topologies, two-norm spaces, co-Saks spaces, etc.)
46A80	Modular spaces
46A99	None of the above, but in this section
46Bxx	Normed linear spaces and Banach spaces; Banach lattices {For function spaces, see 46Exx}
46B03	Isomorphic theory (including renorming) of Banach spaces
46B04	Isometric theory of Banach spaces
46B06	Asymptotic theory of Banach spaces [See also 52A23]

- 46B07 Local theory of Banach spaces
- 46B08 Ultraproduct techniques in Banach space theory [See also [46M07](#)]
- 46B09 Probabilistic methods in Banach space theory [See also [60Bxx](#)]
- 46B10 Duality and reflexivity [See also [46A25](#)]
- 46B15 Summability and bases [See also [46A35](#)]
- 46B20 Geometry and structure of normed linear spaces
- 46B22 Radon-Nikodým, Kreĭn-Milman and related properties [See also [46G10](#)]
- 46B25 Classical Banach spaces in the general theory
- 46B26 Nonseparable Banach spaces
- 46B28 Spaces of operators; tensor products; approximation properties [See also [46A32](#), [46M05](#), [47L05](#), [47L20](#)]
- 46B40 Ordered normed spaces [See also [46A40](#), [46B42](#)]
- 46B42 Banach lattices [See also [46A40](#), [46B40](#)]
- 46B45 Banach sequence spaces [See also [46A45](#)]
- 46B50 Compactness in Banach (or normed) spaces
- 46B70 Interpolation between normed linear spaces [See also [46M35](#)]
- 46B80 Nonlinear classification of Banach spaces; nonlinear quotients
- 46B85 Embeddings of discrete metric spaces into Banach spaces; applications in topology and computer science [See also [05C12](#), [68Rxx](#)]
- 46B99 None of the above, but in this section
- 46Cxx Inner product spaces and their generalizations, Hilbert spaces {For function spaces, see [46Exx](#)}**
- 46C05 Hilbert and pre-Hilbert spaces: geometry and topology (including spaces with semidefinite inner product)
- 46C07 Hilbert subspaces (= operator ranges); complementation (Aronszajn, de Branges, etc.) [See also [46B70](#), [46M35](#)]
- 46C15 Characterizations of Hilbert spaces
- 46C20 Spaces with indefinite inner product (Kreĭn spaces, Pontryagin spaces, etc.) [See also [47B50](#)]
- 46C50 Generalizations of inner products (semi-inner products, partial inner products, etc.)
- 46C99 None of the above, but in this section
- 46Exx Linear function spaces and their duals [See also [30H05](#), [32A38](#), [46F05](#)] {For function algebras, see [46J10](#)}**
- 46E05 Lattices of continuous, differentiable or analytic functions
- 46E10 Topological linear spaces of continuous, differentiable or analytic functions
- 46E15 Banach spaces of continuous, differentiable or analytic functions
- 46E20 Hilbert spaces of continuous, differentiable or analytic functions
- 46E22 Hilbert spaces with reproducing kernels (= [proper] functional Hilbert spaces, including de Branges-Rovnyak and other structured spaces) [See also [47B32](#)]
- 46E25 Rings and algebras of continuous, differentiable or analytic functions {For Banach function algebras, see [46J10](#), [46J15](#)}
- 46E27 Spaces of measures [See also [28A33](#), [46Gxx](#)]
- 46E30 Spaces of measurable functions (L^p -spaces, Orlicz spaces, Köthe function spaces, Lorentz spaces, rearrangement invariant spaces, ideal spaces, etc.)
- 46E35 Sobolev spaces and other spaces of “smooth” functions, embedding theorems, trace theorems
- 46E39 Sobolev (and similar kinds of) spaces of functions of discrete variables
- 46E40 Spaces of vector- and operator-valued functions
- 46E50 Spaces of differentiable or holomorphic functions on infinite-dimensional spaces [See also [46G20](#), [46G25](#), [47H60](#)]
- 46E99 None of the above, but in this section
- 46Fxx Distributions, generalized functions, distribution spaces [See also [46T30](#)]**
- 46F05 Topological linear spaces of test functions, distributions and ultradistributions [See also [46E10](#), [46E35](#)]
- 46F10 Operations with distributions
- 46F12 Integral transforms in distribution spaces [See also [42-XX](#), [44-XX](#)]
- 46F15 Hyperfunctions, analytic functionals [See also [32A25](#), [32A45](#), [32C35](#), [58J15](#)]
- 46F20 Distributions and ultradistributions as boundary values of analytic functions [See also [30D40](#), [30E25](#), [32A40](#)]
- 46F25 Distributions on infinite-dimensional spaces [See also [58C35](#)]
- 46F30 Generalized functions for nonlinear analysis (Rosinger, Colombeau, nonstandard, etc.)
- 46F99 None of the above, but in this section
- 46Gxx Measures, integration, derivative, holomorphy (all involving infinite-dimensional spaces) [See also [28-XX](#), [46Txx](#)]**
- 46G05 Derivatives [See also [46T20](#), [58C20](#), [58C25](#)]
- 46G10 Vector-valued measures and integration [See also [28Bxx](#), [46B22](#)]
- 46G12 Measures and integration on abstract linear spaces [See also [28C20](#), [46T12](#)]
- 46G15 Functional analytic lifting theory [See also [28A51](#)]
- 46G20 Infinite-dimensional holomorphy [See also [32-XX](#), [46E50](#), [46T25](#), [58B12](#), [58C10](#)]
- 46G25 (Spaces of) multilinear mappings, polynomials [See also [46E50](#), [46G20](#), [47H60](#)]
- 46G99 None of the above, but in this section
- 46Hxx Topological algebras, normed rings and algebras, Banach algebras {For group algebras, convolution algebras and measure algebras, see [43A10](#), [43A20](#)}**
- 46H05 General theory of topological algebras
- 46H10 Ideals and subalgebras
- 46H15 Representations of topological algebras
- 46H20 Structure, classification of topological algebras
- 46H25 Normed modules and Banach modules, topological modules (if not placed in [13-XX](#) or [16-XX](#))
- 46H30 Functional calculus in topological algebras [See also [47A60](#)]
- 46H35 Topological algebras of operators [See mainly [47Lxx](#)]
- 46H40 Automatic continuity
- 46H70 Nonassociative topological algebras [See also [46K70](#), [46L70](#)]
- 46H99 None of the above, but in this section
- 46Jxx Commutative Banach algebras and commutative topological algebras [See also [46E25](#)]**
- 46J05 General theory of commutative topological algebras
- 46J10 Banach algebras of continuous functions, function algebras [See also [46E25](#)]
- 46J15 Banach algebras of differentiable or analytic functions, H^p -spaces [See also [30H10](#), [32A35](#), [32A37](#), [32A38](#), [42B30](#)]
- 46J20 Ideals, maximal ideals, boundaries
- 46J25 Representations of commutative topological algebras
- 46J30 Subalgebras
- 46J40 Structure, classification of commutative topological algebras
- 46J45 Radical Banach algebras
- 46J99 None of the above, but in this section
- 46Kxx Topological (rings and) algebras with an involution [See also [16W10](#)]**
- 46K05 General theory of topological algebras with involution
- 46K10 Representations of topological algebras with involution
- 46K15 Hilbert algebras
- 46K50 Nonselfadjoint (sub)algebras in algebras with involution
- 46K70 Nonassociative topological algebras with an involution [See also [46H70](#), [46L70](#)]
- 46K99 None of the above, but in this section
- 46Lxx Selfadjoint operator algebras (C^* -algebras, von Neumann (W^* -) algebras, etc.) [See also [22D25](#), [47Lxx](#)]**
- 46L05 General theory of C^* -algebras
- 46L06 Tensor products of C^* -algebras
- 46L07 Operator spaces and completely bounded maps [See also [47L25](#)]
- 46L08 C^* -modules
- 46L09 Free products of C^* -algebras
- 46L10 General theory of von Neumann algebras
- 46L30 States
- 46L35 Classifications of C^* -algebras
- 46L36 Classification of factors
- 46L37 Subfactors and their classification
- 46L40 Automorphisms
- 46L45 Decomposition theory for C^* -algebras
- 46L51 Noncommutative measure and integration
- 46L52 Noncommutative function spaces
- 46L53 Noncommutative probability and statistics
- 46L54 Free probability and free operator algebras
- 46L55 Noncommutative dynamical systems [See also [28Dxx](#), [37Kxx](#), [37Lxx](#), [54H20](#)]
- 46L57 Derivations, dissipations and positive semigroups in C^* -algebras
- 46L60 Applications of selfadjoint operator algebras to physics [See also [46N50](#), [46N55](#), [47L90](#), [81T05](#), [82B10](#), [82C10](#)]
- 46L65 Quantizations, deformations
- 46L70 Nonassociative selfadjoint operator algebras [See also [46H70](#), [46K70](#)]
- 46L80 K -theory and operator algebras (including cyclic theory) [See also [18F25](#), [19Kxx](#), [46M20](#), [55Rxx](#), [58J22](#)]
- 46L85 Noncommutative topology [See also [58B32](#), [58B34](#), [58J22](#)]
- 46L87 Noncommutative differential geometry [See also [58B32](#), [58B34](#), [58J22](#)]
- 46L89 Other “noncommutative” mathematics based on C^* -algebra theory [See also [58B32](#), [58B34](#), [58J22](#)]
- 46L99 None of the above, but in this section
- 46Mxx Methods of category theory in functional analysis [See also [18-XX](#)]**
- 46M05 Tensor products [See also [46A32](#), [46B28](#), [47A80](#)]
- 46M07 Ultraproducts [See also [46B08](#), [46S20](#)]
- 46M10 Projective and injective objects [See also [46A22](#)]
- 46M15 Categories, functors {For K -theory, EXT, etc., see [19K33](#), [46L80](#), [46M18](#), [46M20](#)}
- 46M18 Homological methods (exact sequences, right inverses, lifting, etc.)

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46M20	Methods of algebraic topology (cohomology, sheaf and bundle theory, etc.) [See also 14F05 , 18Fxx , 19Kxx , 32Cxx , 32Lxx , 46L80 , 46M15 , 46M18 , 55Rxx]	47A62	Equations involving linear operators, with operator unknowns
46M35	Abstract interpolation of topological vector spaces [See also 46B70]	47A63	Operator inequalities
46M40	Inductive and projective limits [See also 46A13]	47A64	Operator means, shorted operators, etc.
46M99	None of the above, but in this section	47A65	Structure theory
46Nxx	Miscellaneous applications of functional analysis [See also 47Nxx]	47A66	Quasitriangular and nonquasitriangular, quasidiagonal and nonquasidiagonal operators
46N10	Applications in optimization, convex analysis, mathematical programming, economics	47A67	Representation theory
46N20	Applications to differential and integral equations	47A68	Factorization theory (including Wiener-Hopf and spectral factorizations)
46N30	Applications in probability theory and statistics	47A70	(Generalized) eigenfunction expansions; rigged Hilbert spaces
46N40	Applications in numerical analysis [See also 65Jxx]	47A75	Eigenvalue problems [See also 47J10 , 49R05]
46N50	Applications in quantum physics	47A80	Tensor products of operators [See also 46M05]
46N55	Applications in statistical physics	47A99	None of the above, but in this section
46N60	Applications in biology and other sciences	47Bxx	Special classes of linear operators
46N99	None of the above, but in this section	47B06	Riesz operators; eigenvalue distributions; approximation numbers, s -numbers, Kolmogorov numbers, entropy numbers, etc. of operators
46Sxx	Other (nonclassical) types of functional analysis [See also 47Sxx]	47B07	Operators defined by compactness properties
46S10	Functional analysis over fields other than \mathbf{R} or \mathbf{C} or the quaternions; non-Archimedean functional analysis [See also 12J25 , 32P05]	47B10	Operators belonging to operator ideals (nuclear, p -summing, in the Schatten-von Neumann classes, etc.) [See also 47L20]
46S20	Nonstandard functional analysis [See also 03H05]	47B15	Hermitian and normal operators (spectral measures, functional calculus, etc.)
46S30	Constructive functional analysis [See also 03F60]	47B20	Subnormal operators, hyponormal operators, etc.
46S40	Fuzzy functional analysis [See also 03E72]	47B25	Symmetric and selfadjoint operators (unbounded)
46S50	Functional analysis in probabilistic metric linear spaces	47B32	Operators in reproducing-kernel Hilbert spaces (including de Branges, de Branges-Rovnyak, and other structured spaces) [See also 46E22]
46S60	Functional analysis on superspaces (supermanifolds) or graded spaces [See also 58A50 and 58C50]	47B33	Composition operators
46S99	None of the above, but in this section	47B34	Kernel operators
46Txx	Nonlinear functional analysis [See also 47Hxx , 47Jxx , 58Cxx , 58Dxx]	47B35	Toeplitz operators, Hankel operators, Wiener-Hopf operators [See also 45P05 , 47G10 for other integral operators; see also 32A25 , 32M15]
46T05	Infinite-dimensional manifolds [See also 53Axx , 57N20 , 58Bxx , 58Dxx]	47B36	Jacobi (tridiagonal) operators (matrices) and generalizations
46T10	Manifolds of mappings	47B37	Operators on special spaces (weighted shifts, operators on sequence spaces, etc.)
46T12	Measure (Gaussian, cylindrical, etc.) and integrals (Feynman, path, Fresnel, etc.) on manifolds [See also 28Cxx , 46G12 , 60-XX]	47B38	Operators on function spaces (general)
46T20	Continuous and differentiable maps [See also 46G05]	47B39	Difference operators [See also 39A70]
46T25	Holomorphic maps [See also 46G20]	47B40	Spectral operators, decomposable operators, well-bounded operators, etc.
46T30	Distributions and generalized functions on nonlinear spaces [See also 46Fxx]	47B44	Accretive operators, dissipative operators, etc.
46T99	None of the above, but in this section	47B47	Commutators, derivations, elementary operators, etc.
47-XX	OPERATOR THEORY	47B48	Operators on Banach algebras
47-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	47B49	Transformers, preservers (operators on spaces of operators)
47-01	Instructional exposition (textbooks, tutorial papers, etc.)	47B50	Operators on spaces with an indefinite metric [See also 46C50]
47-02	Research exposition (monographs, survey articles)	47B60	Operators on ordered spaces
47-03	Historical (must also be assigned at least one classification number from Section 01)	47B65	Positive operators and order-bounded operators
47-04	Explicit machine computation and programs (not the theory of computation or programming)	47B80	Random operators [See also 47H40 , 60H25]
47-06	Proceedings, conferences, collections, etc.	47B99	None of the above, but in this section
47Axx	General theory of linear operators	47Cxx	Individual linear operators as elements of algebraic systems
47A05	General (adjoints, conjugates, products, inverses, domains, ranges, etc.)	47C05	Operators in algebras
47A06	Linear relations (multivalued linear operators)	47C10	Operators in $*$ -algebras
47A07	Forms (bilinear, sesquilinear, multilinear)	47C15	Operators in C^* - or von Neumann algebras
47A10	Spectrum, resolvent	47C99	None of the above, but in this section
47A11	Local spectral properties	47Dxx	Groups and semigroups of linear operators, their generalizations and applications
47A12	Numerical range, numerical radius	47D03	Groups and semigroups of linear operators {For nonlinear operators, see 47H20 ; see also 20M20 }
47A13	Several-variable operator theory (spectral, Fredholm, etc.)	47D06	One-parameter semigroups and linear evolution equations [See also 34G10 , 34K30]
47A15	Invariant subspaces [See also 47A46]	47D07	Markov semigroups and applications to diffusion processes {For Markov processes, see 60Jxx }
47A16	Cyclic vectors, hypercyclic and chaotic operators	47D08	Schrödinger and Feynman-Kac semigroups
47A20	Dilations, extensions, compressions	47D09	Operator sine and cosine functions and higher-order Cauchy problems [See also 34G10]
47A25	Spectral sets	47D60	C -semigroups, regularized semigroups
47A30	Norms (inequalities, more than one norm, etc.)	47D62	Integrated semigroups
47A35	Ergodic theory [See also 28Dxx , 37Axx]	47D99	None of the above, but in this section
47A40	Scattering theory [See also 34L25 , 35P25 , 37K15 , 58J50 , 81Uxx]	47Exx	Ordinary differential operators [See also 34Bxx , 34Lxx]
47A45	Canonical models for contractions and nonselfadjoint operators	47E05	Ordinary differential operators [See also 34Bxx , 34Lxx] (should also be assigned at least one other classification number in section 47)
47A46	Chains (nests) of projections or of invariant subspaces, integrals along chains, etc.	47E99	None of the above, but in this section
47A48	Operator colligations (= nodes), vessels, linear systems, characteristic functions, realizations, etc.	47Fxx	Partial differential operators [See also 35Pxx , 58Jxx]
47A50	Equations and inequalities involving linear operators, with vector unknowns	47F05	Partial differential operators [See also 35Pxx , 58Jxx] (should also be assigned at least one other classification number in section 47)
47A52	Ill-posed problems, regularization [See also 35R25 , 47J06 , 65F22 , 65J20 , 65L08 , 65M30 , 65R30]	47F99	None of the above, but in this section
47A53	(Semi-) Fredholm operators; index theories [See also 58B15 , 58J20]	47Gxx	Integral, integro-differential, and pseudodifferential operators [See also 58Jxx]
47A55	Perturbation theory [See also 47H14 , 58J37 , 70H09 , 81Q15]	47G10	Integral operators [See also 45P05]
47A56	Functions whose values are linear operators (operator and matrix valued functions, etc., including analytic and meromorphic ones)	47G20	Integro-differential operators [See also 34K30 , 35R09 , 35R10 , 45Jxx , 45Kxx]
47A57	Operator methods in interpolation, moment and extension problems [See also 30E05 , 42A70 , 42A82 , 44A60]	47G30	Pseudodifferential operators [See also 35Sxx , 58Jxx]
47A58	Operator approximation theory		
47A60	Functional calculus		

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47G40	Potential operators [See also 31–XX]	47Sxx	Other (nonclassical) types of operator theory [See also 46Sxx]
47G99	None of the above, but in this section	47S10	Operator theory over fields other than R , C or the quaternions; non-Archimedean operator theory
47Hxx	Nonlinear operators and their properties {For global and geometric aspects, see 49J53 , 58–XX , especially 58Cxx }	47S20	Nonstandard operator theory [See also 03H05]
47H04	Set-valued operators [See also 28B20 , 54C60 , 58C06]	47S30	Constructive operator theory [See also 03F60]
47H05	Monotone operators and generalizations	47S40	Fuzzy operator theory [See also 03E72]
47H06	Accretive operators, dissipative operators, etc.	47S50	Operator theory in probabilistic metric linear spaces [See also 54E70]
47H07	Monotone and positive operators on ordered Banach spaces or other ordered topological vector spaces	47S99	None of the above, but in this section
47H08	Measures of noncompactness and condensing mappings, K -set contractions, etc.	49–XX	CALCULUS OF VARIATIONS AND OPTIMAL CONTROL; OPTIMIZATION [See also 34H05 , 34K35 , 65Kxx , 90Cxx , 93–XX]
47H09	Contraction-type mappings, nonexpansive mappings, A -proper mappings, etc.	49–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
47H10	Fixed-point theorems [See also 37C25 , 54H25 , 55M20 , 58C30]	49–01	Instructional exposition (textbooks, tutorial papers, etc.)
47H11	Degree theory [See also 55M25 , 58C30]	49–02	Research exposition (monographs, survey articles)
47H14	Perturbations of nonlinear operators [See also 47A55 , 58J37 , 70H09 , 70K60 , 81Q15]	49–03	Historical (must also be assigned at least one classification number from Section 01)
47H20	Semigroups of nonlinear operators [See also 37L05 , 47J35 , 54H15 , 58D07]	49–04	Explicit machine computation and programs (not the theory of computation or programming)
47H25	Nonlinear ergodic theorems [See also 28Dxx , 37Axx , 47A35]	49–06	Proceedings, conferences, collections, etc.
47H30	Particular nonlinear operators (superposition, Hammerstein, Nemytskiĭ, Uryson, etc.) [See also 45Gxx , 45P05]	49Jxx	Existence theories
47H40	Random operators [See also 47B80 , 60H25]	49J05	Free problems in one independent variable
47H60	Multilinear and polynomial operators [See also 46G25]	49J10	Free problems in two or more independent variables
47H99	None of the above, but in this section	49J15	Optimal control problems involving ordinary differential equations
47Jxx	Equations and inequalities involving nonlinear operators [See also 46Txx] {For global and geometric aspects, see 58–XX }	49J20	Optimal control problems involving partial differential equations
47J05	Equations involving nonlinear operators (general) [See also 47H10 , 47J25]	49J21	Optimal control problems involving relations other than differential equations
47J06	Nonlinear ill-posed problems [See also 35R25 , 47A52 , 65F22 , 65J20 , 65L08 , 65M30 , 65R30]	49J27	Problems in abstract spaces [See also 90C48 , 93C25]
47J07	Abstract inverse mapping and implicit function theorems [See also 46T20 and 58C15]	49J30	Optimal solutions belonging to restricted classes (Lipschitz controls, bang-bang controls, etc.)
47J10	Nonlinear spectral theory, nonlinear eigenvalue problems [See also 49R05]	49J35	Minimax problems
47J15	Abstract bifurcation theory [See also 34C23 , 37Gxx , 58E07 , 58E09]	49J40	Variational methods including variational inequalities [See also 47J20]
47J20	Variational and other types of inequalities involving nonlinear operators (general) [See also 49J40]	49J45	Methods involving semicontinuity and convergence; relaxation
47J22	Variational and other types of inclusions [See also 34A60 , 49J21 , 49K21]	49J50	Fréchet and Gateaux differentiability [See also 46G05 , 58C20]
47J25	Iterative procedures [See also 65J15]	49J52	Nonsmooth analysis [See also 46G05 , 58C50 , 90C56]
47J30	Variational methods [See also 58Exx]	49J53	Set-valued and variational analysis [See also 28B20 , 47H04 , 54C60 , 58C06]
47J35	Nonlinear evolution equations [See also 34G20 , 35K90 , 35L90 , 35Qxx , 35R20 , 37Kxx , 37Lxx , 47H20 , 58D25]	49J55	Problems involving randomness [See also 93E20]
47J40	Equations with hysteresis operators [See also 34C55 , 74N30]	49J99	None of the above, but in this section
47J99	None of the above, but in this section	49Kxx	Optimality conditions
47Lxx	Linear spaces and algebras of operators [See also 46Lxx]	49K05	Free problems in one independent variable
47L05	Linear spaces of operators [See also 46A32 and 46B28]	49K10	Free problems in two or more independent variables
47L07	Convex sets and cones of operators [See also 46A55]	49K15	Problems involving ordinary differential equations
47L10	Algebras of operators on Banach spaces and other topological linear spaces	49K20	Problems involving partial differential equations
47L15	Operator algebras with symbol structure	49K21	Problems involving relations other than differential equations
47L20	Operator ideals [See also 47B10]	49K27	Problems in abstract spaces [See also 90C48 , 93C25]
47L22	Ideals of polynomials and of multilinear mappings	49K30	Optimal solutions belonging to restricted classes
47L25	Operator spaces (= matricially normed spaces) [See also 46L07]	49K35	Minimax problems
47L30	Abstract operator algebras on Hilbert spaces	49K40	Sensitivity, stability, well-posedness [See also 90C31]
47L35	Nest algebras, CSL algebras	49K45	Problems involving randomness [See also 93E20]
47L40	Limit algebras, subalgebras of C^* -algebras	49K99	None of the above, but in this section
47L45	Dual algebras; weakly closed singly generated operator algebras	49Lxx	Hamilton-Jacobi theories, including dynamic programming
47L50	Dual spaces of operator algebras	49L20	Dynamic programming method
47L55	Representations of (nonselfadjoint) operator algebras	49L25	Viscosity solutions
47L60	Algebras of unbounded operators; partial algebras of operators	49L99	None of the above, but in this section
47L65	Crossed product algebras (analytic crossed products)	49Mxx	Numerical methods [See also 90Cxx , 65Kxx]
47L70	Nonassociative nonselfadjoint operator algebras	49M05	Methods based on necessary conditions
47L75	Other nonselfadjoint operator algebras	49M15	Newton-type methods
47L80	Algebras of specific types of operators (Toeplitz, integral, pseudodifferential, etc.)	49M20	Methods of relaxation type
47L90	Applications of operator algebras to physics	49M25	Discrete approximations
47L99	None of the above, but in this section	49M27	Decomposition methods
47Nxx	Miscellaneous applications of operator theory [See also 46Nxx]	49M29	Methods involving duality
47N10	Applications in optimization, convex analysis, mathematical programming, economics	49M30	Other methods
47N20	Applications to differential and integral equations	49M37	Methods of nonlinear programming type [See also 90C30 , 65Kxx]
47N30	Applications in probability theory and statistics	49M99	None of the above, but in this section
47N40	Applications in numerical analysis [See also 65Jxx]	49Nxx	Miscellaneous topics
47N50	Applications in the physical sciences	49N05	Linear optimal control problems [See also 93C05]
47N60	Applications in chemistry and life sciences	49N10	Linear-quadratic problems
47N70	Applications in systems theory, circuits, and control theory	49N15	Duality theory
47N99	None of the above, but in this section	49N20	Periodic optimization
		49N25	Impulsive optimal control problems
		49N30	Problems with incomplete information [See also 93C41]
		49N35	Optimal feedback synthesis [See also 93B52]
		49N45	Inverse problems
		49N60	Regularity of solutions
		49N70	Differential games
		49N75	Pursuit and evasion games
		49N90	Applications of optimal control and differential games [See also 90C90 , 93C95]
		49N99	None of the above, but in this section

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49Qxx	Manifolds [See also 58Exx]
49Q05	Minimal surfaces [See also 53A10 , 58E12]
49Q10	Optimization of shapes other than minimal surfaces [See also 90C90]
49Q12	Sensitivity analysis
49Q15	Geometric measure and integration theory, integral and normal currents [See also 28A75 , 32C30 , 58A25 , 58C35]
49Q20	Variational problems in a geometric measure-theoretic setting
49Q99	None of the above, but in this section
49Rxx	Variational methods for eigenvalues of operators [See also 47A75]
49R05	Variational methods for eigenvalues of operators [See also 47A75] (should also be assigned at least one other classification number in Section 49)
49R99	None of the above, but in this section
49Sxx	Variational principles of physics
49S05	Variational principles of physics (should also be assigned at least one other classification number in section 49)
49S99	None of the above, but in this section
51–XX	GEOMETRY {For algebraic geometry, see 14–XX}
51–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
51–01	Instructional exposition (textbooks, tutorial papers, etc.)
51–02	Research exposition (monographs, survey articles)
51–03	Historical (must also be assigned at least one classification number from Section 01)
51–04	Explicit machine computation and programs (not the theory of computation or programming)
51–06	Proceedings, conferences, collections, etc.
51Axx	Linear incidence geometry
51A05	General theory and projective geometries
51A10	Homomorphism, automorphism and dualities
51A15	Structures with parallelism
51A20	Configuration theorems
51A25	Algebraization [See also 12Kxx , 20N05]
51A30	Desarguesian and Pappian geometries
51A35	Non-Desarguesian affine and projective planes
51A40	Translation planes and spreads
51A45	Incidence structures imbeddable into projective geometries
51A50	Polar geometry, symplectic spaces, orthogonal spaces
51A99	None of the above, but in this section
51Bxx	Nonlinear incidence geometry
51B05	General theory
51B10	Möbius geometries
51B15	Laguerre geometries
51B20	Minkowski geometries
51B25	Lie geometries
51B99	None of the above, but in this section
51Cxx	Ring geometry (Hjelmslev, Barbilian, etc.)
51C05	Ring geometry (Hjelmslev, Barbilian, etc.)
51C99	None of the above, but in this section
51Dxx	Geometric closure systems
51D05	Abstract (Maeda) geometries
51D10	Abstract geometries with exchange axiom
51D15	Abstract geometries with parallelism
51D20	Combinatorial geometries [See also 05B25 , 05B35]
51D25	Lattices of subspaces [See also 05B35]
51D30	Continuous geometries and related topics [See also 06Cxx]
51D99	None of the above, but in this section
51Exx	Finite geometry and special incidence structures
51E05	General block designs [See also 05B05]
51E10	Steiner systems
51E12	Generalized quadrangles, generalized polygons
51E14	Finite partial geometries (general), nets, partial spreads
51E15	Affine and projective planes
51E20	Combinatorial structures in finite projective spaces [See also 05Bxx]
51E21	Blocking sets, ovals, k -arcs
51E22	Linear codes and caps in Galois spaces [See also 94B05]
51E23	Spreads and packing problems
51E24	Buildings and the geometry of diagrams
51E25	Other finite nonlinear geometries
51E26	Other finite linear geometries
51E30	Other finite incidence structures [See also 05B30]
51E99	None of the above, but in this section
51Fxx	Metric geometry
51F05	Absolute planes
51F10	Absolute spaces
51F15	Reflection groups, reflection geometries [See also 20H10 , 20H15 ; for Coxeter groups, see 20F55]
51F20	Congruence and orthogonality [See also 20H05]
51F25	Orthogonal and unitary groups [See also 20H05]
51F99	None of the above, but in this section

51Gxx	Ordered geometries (ordered incidence structures, etc.)
51G05	Ordered geometries (ordered incidence structures, etc.)
51G99	None of the above, but in this section
51Hxx	Topological geometry
51H05	General theory
51H10	Topological linear incidence structures
51H15	Topological nonlinear incidence structures
51H20	Topological geometries on manifolds [See also 57–XX]
51H25	Geometries with differentiable structure [See also 53Cxx , 53C70]
51H30	Geometries with algebraic manifold structure [See also 14–XX]
51H99	None of the above, but in this section
51Jxx	Incidence groups
51J05	General theory
51J10	Projective incidence groups
51J15	Kinematic spaces
51J20	Representation by near-fields and near-algebras [See also 12K05 , 16Y30]
51J99	None of the above, but in this section
51Kxx	Distance geometry
51K05	General theory
51K10	Synthetic differential geometry
51K99	None of the above, but in this section
51Lxx	Geometric order structures [See also 53C75]
51L05	Geometry of orders of nondifferentiable curves
51L10	Directly differentiable curves
51L15	n -vertex theorems via direct methods
51L20	Geometry of orders of surfaces
51L99	None of the above, but in this section
51Mxx	Real and complex geometry
51M04	Elementary problems in Euclidean geometries
51M05	Euclidean geometries (general) and generalizations
51M09	Elementary problems in hyperbolic and elliptic geometries
51M10	Hyperbolic and elliptic geometries (general) and generalizations
51M15	Geometric constructions
51M16	Inequalities and extremum problems {For convex problems, see 52A40 }
51M20	Polyhedra and polytopes; regular figures, division of spaces [See also 51F15]
51M25	Length, area and volume [See also 26B15]
51M30	Line geometries and their generalizations [See also 53A25]
51M35	Synthetic treatment of fundamental manifolds in projective geometries (Grassmannians, Veronesians and their generalizations) [See also 14M15]
51M99	None of the above, but in this section
51Nxx	Analytic and descriptive geometry
51N05	Descriptive geometry [See also 65D17 , 68U07]
51N10	Affine analytic geometry
51N15	Projective analytic geometry
51N20	Euclidean analytic geometry
51N25	Analytic geometry with other transformation groups
51N30	Geometry of classical groups [See also 20Gxx , 14L35]
51N35	Questions of classical algebraic geometry [See also 14Nxx]
51N99	None of the above, but in this section
51Pxx	Geometry and physics (should also be assigned at least one other classification number from Sections 70–86)
51P05	Geometry and physics (should also be assigned at least one other classification number from Sections 70–86)
51P99	None of the above, but in this section
52–XX	CONVEX AND DISCRETE GEOMETRY
52–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
52–01	Instructional exposition (textbooks, tutorial papers, etc.)
52–02	Research exposition (monographs, survey articles)
52–03	Historical (must also be assigned at least one classification number from Section 01)
52–04	Explicit machine computation and programs (not the theory of computation or programming)
52–06	Proceedings, conferences, collections, etc.
52Axx	General convexity
52A01	Axiomatic and generalized convexity
52A05	Convex sets without dimension restrictions
52A07	Convex sets in topological vector spaces [See also 46A55]
52A10	Convex sets in 2 dimensions (including convex curves) [See also 53A04]
52A15	Convex sets in 3 dimensions (including convex surfaces) [See also 53A05 , 53C45]
52A20	Convex sets in n dimensions (including convex hypersurfaces) [See also 53A07 , 53C45]
52A21	Finite-dimensional Banach spaces (including special norms, zonoids, etc.) [See also 46Bxx]

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52A22	Random convex sets and integral geometry [See also 53C65 , 60D05]	53Bxx	Local differential geometry
52A23	Asymptotic theory of convex bodies [See also 46B06]	53B05	Linear and affine connections
52A27	Approximation by convex sets	53B10	Projective connections
52A30	Variants of convex sets (star-shaped, (m, n) -convex, etc.)	53B15	Other connections
52A35	Helly-type theorems and geometric transversal theory	53B20	Local Riemannian geometry
52A37	Other problems of combinatorial convexity	53B21	Methods of Riemannian geometry
52A38	Length, area, volume [See also 26B15 , 28A75 , 49Q20]	53B25	Local submanifolds [See also 53C40]
52A39	Mixed volumes and related topics	53B30	Lorentz metrics, indefinite metrics
52A40	Inequalities and extremum problems	53B35	Hermitian and Kählerian structures [See also 32Cxx]
52A41	Convex functions and convex programs [See also 26B25 , 90C25]	53B40	Finsler spaces and generalizations (areal metrics)
52A55	Spherical and hyperbolic convexity	53B50	Applications to physics
52A99	None of the above, but in this section	53B99	None of the above, but in this section
52Bxx	Polytopes and polyhedra	53Cxx	Global differential geometry [See also 51H25 , 58–XX ; for related bundle theory, see 55Rxx , 57Rxx]
52B05	Combinatorial properties (number of faces, shortest paths, etc.) [See also 05Cxx]	53C05	Connections, general theory
52B10	Three-dimensional polytopes	53C07	Special connections and metrics on vector bundles (Hermite-Einstein-Yang-Mills) [See also 32Q20]
52B11	n -dimensional polytopes	53C08	Gerbes, differential characters: differential geometric aspects
52B12	Special polytopes (linear programming, centrally symmetric, etc.)	53C10	G -structures
52B15	Symmetry properties of polytopes	53C12	Foliations (differential geometric aspects) [See also 57R30 , 57R32]
52B20	Lattice polytopes (including relations with commutative algebra and algebraic geometry) [See also 06A11 , 13F20 , 13Hxx]	53C15	General geometric structures on manifolds (almost complex, almost product structures, etc.)
52B22	Shellability	53C17	Sub-Riemannian geometry
52B35	Gale and other diagrams	53C20	Global Riemannian geometry, including pinching [See also 31C12 , 58B20]
52B40	Matroids (realizations in the context of convex polytopes, convexity in combinatorial structures, etc.) [See also 05B35 , 52Cxx]	53C21	Methods of Riemannian geometry, including PDE methods; curvature restrictions [See also 58J60]
52B45	Dissections and valuations (Hilbert’s third problem, etc.)	53C22	Geodesics [See also 58E10]
52B55	Computational aspects related to convexity {For computational geometry and algorithms, see 68Q25 , 68U05 ; for numerical algorithms, see 65Yxx } [See also 68Uxx]	53C23	Global geometric and topological methods (à la Gromov); differential geometric analysis on metric spaces
52B60	Isoperimetric problems for polytopes	53C24	Rigidity results
52B70	Polyhedral manifolds	53C25	Special Riemannian manifolds (Einstein, Sasakian, etc.)
52B99	None of the above, but in this section	53C26	Hyper-Kähler and quaternionic Kähler geometry, “special” geometry
52Cxx	Discrete geometry	53C27	Spin and Spin ^c geometry
52C05	Lattices and convex bodies in 2 dimensions [See also 11H06 , 11H31 , 11P21]	53C28	Twistor methods [See also 32L25]
52C07	Lattices and convex bodies in n dimensions [See also 11H06 , 11H31 , 11P21]	53C29	Issues of holonomy
52C10	Erdős problems and related topics of discrete geometry [See also 11Hxx]	53C30	Homogeneous manifolds [See also 14M15 , 14M17 , 32M10 , 57T15]
52C15	Packing and covering in 2 dimensions [See also 05B40 , 11H31]	53C35	Symmetric spaces [See also 32M15 , 57T15]
52C17	Packing and covering in n dimensions [See also 05B40 , 11H31]	53C38	Calibrations and calibrated geometries
52C20	Tilings in 2 dimensions [See also 05B45 , 51M20]	53C40	Global submanifolds [See also 53B25]
52C22	Tilings in n dimensions [See also 05B45 , 51M20]	53C42	Immersions (minimal, prescribed curvature, tight, etc.) [See also 49Q05 , 49Q10 , 53A10 , 57R40 , 57R42]
52C23	Quasicrystals, aperiodic tilings	53C43	Differential geometric aspects of harmonic maps [See also 58E20]
52C25	Rigidity and flexibility of structures [See also 70B15]	53C44	Geometric evolution equations (mean curvature flow, Ricci flow, etc.)
52C26	Circle packings and discrete conformal geometry	53C45	Global surface theory (convex surfaces à la A. D. Aleksandrov)
52C30	Planar arrangements of lines and pseudolines	53C50	Lorentz manifolds, manifolds with indefinite metrics
52C35	Arrangements of points, flats, hyperplanes [See also 32S22]	53C55	Hermitian and Kählerian manifolds [See also 32Cxx]
52C40	Oriented matroids	53C56	Other complex differential geometry [See also 32Cxx]
52C45	Combinatorial complexity of geometric structures [See also 68U05]	53C60	Finsler spaces and generalizations (areal metrics) [See also 58B20]
52C99	None of the above, but in this section	53C65	Integral geometry [See also 52A22 , 60D05]; differential forms, currents, etc. [See mainly 58Axx]
53–XX	DIFFERENTIAL GEOMETRY {For differential topology, see 57Rxx . For foundational questions of differentiable manifolds, see 58Axx }	53C70	Direct methods (G -spaces of Busemann, etc.)
53–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	53C75	Geometric orders, order geometry [See also 51Lxx]
53–01	Instructional exposition (textbooks, tutorial papers, etc.)	53C80	Applications to physics
53–02	Research exposition (monographs, survey articles)	53C99	None of the above, but in this section
53–03	Historical (must also be assigned at least one classification number from Section 01)	53Dxx	Symplectic geometry, contact geometry [See also 37Jxx , 70Gxx , 70Hxx]
53–04	Explicit machine computation and programs (not the theory of computation or programming)	53D05	Symplectic manifolds, general
53–06	Proceedings, conferences, collections, etc.	53D10	Contact manifolds, general
53Axx	Classical differential geometry	53D12	Lagrangian submanifolds; Maslov index
53A04	Curves in Euclidean space	53D15	Almost contact and almost symplectic manifolds
53A05	Surfaces in Euclidean space	53D17	Poisson manifolds; Poisson groupoids and algebroids
53A07	Higher-dimensional and -codimensional surfaces in Euclidean n -space	53D18	Generalized geometries (à la Hitchin)
53A10	Minimal surfaces, surfaces with prescribed mean curvature [See also 49Q05 , 49Q10 , 53C42]	53D20	Momentum maps; symplectic reduction
53A15	Affine differential geometry	53D22	Canonical transformations
53A17	Kinematics	53D25	Geodesic flows
53A20	Projective differential geometry	53D30	Symplectic structures of moduli spaces
53A25	Differential line geometry	53D35	Global theory of symplectic and contact manifolds [See also 57Rxx]
53A30	Conformal differential geometry	53D37	Mirror symmetry, symplectic aspects; homological mirror symmetry; Fukaya category [See also 14J33]
53A35	Non-Euclidean differential geometry	53D40	Floer homology and cohomology, symplectic aspects
53A40	Other special differential geometries	53D42	Symplectic field theory; contact homology
53A45	Vector and tensor analysis	53D45	Gromov-Witten invariants, quantum cohomology, Frobenius manifolds [See also 14N35]
53A55	Differential invariants (local theory), geometric objects	53D50	Geometric quantization
53A60	Geometry of webs [See also 14C21 , 20N05]	53D55	Deformation quantization, star products
53A99	None of the above, but in this section	53D99	None of the above, but in this section
		53Zxx	Applications to physics
		53Z05	Applications to physics
		53Z99	None of the above, but in this section

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54–XX	GENERAL TOPOLOGY {For the topology of manifolds of all dimensions, see 57Nxx}	54E35	Metric spaces, metrizability
54–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	54E40	Special maps on metric spaces
54–01	Instructional exposition (textbooks, tutorial papers, etc.)	54E45	Compact (locally compact) metric spaces
54–02	Research exposition (monographs, survey articles)	54E50	Complete metric spaces
54–03	Historical (must also be assigned at least one classification number from Section 01)	54E52	Baire category, Baire spaces
54–04	Explicit machine computation and programs (not the theory of computation or programming)	54E55	Bitopologies
54–06	Proceedings, conferences, collections, etc.	54E70	Probabilistic metric spaces
54Axx	Generalities	54E99	None of the above, but in this section
54A05	Topological spaces and generalizations (closure spaces, etc.)	54Fxx	Special properties
54A10	Several topologies on one set (change of topology, comparison of topologies, lattices of topologies)	54F05	Linearly ordered topological spaces, generalized ordered spaces, and partially ordered spaces [See also 06B30, 06F30]
54A15	Syntopogeneous structures	54F15	Continua and generalizations
54A20	Convergence in general topology (sequences, filters, limits, convergence spaces, etc.)	54F35	Higher-dimensional local connectedness [See also 55Mxx, 55Nxx]
54A25	Cardinality properties (cardinal functions and inequalities, discrete subsets) [See also 03Exx] {For ultrafilters, see 54D80}	54F45	Dimension theory [See also 55M10]
54A35	Consistency and independence results [See also 03E35]	54F50	Spaces of dimension ≤ 1 ; curves, dendrites [See also 26A03]
54A40	Fuzzy topology [See also 03E72]	54F55	Unicoherence, multicoherence
54A99	None of the above, but in this section	54F65	Topological characterizations of particular spaces
54Bxx	Basic constructions	54F99	None of the above, but in this section
54B05	Subspaces	54Gxx	Peculiar spaces
54B10	Product spaces	54G05	Extremally disconnected spaces, F -spaces, etc.
54B15	Quotient spaces, decompositions	54G10	P -spaces
54B17	Adjunction spaces and similar constructions	54G12	Scattered spaces
54B20	Hyperspaces	54G15	Pathological spaces
54B30	Categorical methods [See also 18B30]	54G20	Counterexamples
54B35	Spectra	54G99	None of the above, but in this section
54B40	Presheaves and sheaves [See also 18F20]	54Hxx	Connections with other structures, applications
54B99	None of the above, but in this section	54H05	Descriptive set theory (topological aspects of Borel, analytic, projective, etc. sets) [See also 03E15, 26A21, 28A05]
54Cxx	Maps and general types of spaces defined by maps	54H10	Topological representations of algebraic systems [See also 22–XX]
54C05	Continuous maps	54H11	Topological groups [See also 22A05]
54C08	Weak and generalized continuity	54H12	Topological lattices, etc. [See also 06B30, 06F30]
54C10	Special maps on topological spaces (open, closed, perfect, etc.)	54H13	Topological fields, rings, etc. [See also 12Jxx] {For algebraic aspects, see 13Jxx, 16W80}
54C15	Retraction	54H15	Transformation groups and semigroups [See also 20M20, 22–XX, 57Sxx]
54C20	Extension of maps	54H20	Topological dynamics [See also 28Dxx, 37Bxx]
54C25	Embedding	54H25	Fixed-point and coincidence theorems [See also 47H10, 55M20]
54C30	Real-valued functions [See also 26–XX]	54H99	None of the above, but in this section
54C35	Function spaces [See also 46Exx, 58D15]	54Jxx	Nonstandard topology [See also 03H05]
54C40	Algebraic properties of function spaces [See also 46J10]	54J05	Nonstandard topology [See also 03H05]
54C45	C - and C^* -embedding	54J99	None of the above, but in this section
54C50	Special sets defined by functions [See also 26A21]	55–XX	ALGEBRAIC TOPOLOGY
54C55	Absolute neighborhood extensor, absolute extensor, absolute neighborhood retract (ANR), absolute retract spaces (general properties) [See also 55M15]	55–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
54C56	Shape theory [See also 55P55, 57N25]	55–01	Instructional exposition (textbooks, tutorial papers, etc.)
54C60	Set-valued maps [See also 26E25, 28B20, 47H04, 58C06]	55–02	Research exposition (monographs, survey articles)
54C65	Selections [See also 28B20]	55–03	Historical (must also be assigned at least one classification number from Section 01)
54C70	Entropy	55–04	Explicit machine computation and programs (not the theory of computation or programming)
54C99	None of the above, but in this section	55–06	Proceedings, conferences, collections, etc.
54Dxx	Fairly general properties	55Mxx	Classical topics {For the topology of Euclidean spaces and manifolds, see 57Nxx}
54D05	Connected and locally connected spaces (general aspects)	55M05	Duality
54D10	Lower separation axioms (T_0 – T_3 , etc.)	55M10	Dimension theory [See also 54F45]
54D15	Higher separation axioms (completely regular, normal, perfectly or collectionwise normal, etc.)	55M15	Absolute neighborhood retracts [See also 54C55]
54D20	Noncompact covering properties (paracompact, Lindelöf, etc.)	55M20	Fixed points and coincidences [See also 54H25]
54D25	“ P -minimal” and “ P -closed” spaces	55M25	Degree, winding number
54D30	Compactness	55M30	Ljusternik-Schnirelman (Lyusternik-Shnirel’man) category of a space
54D35	Extensions of spaces (compactifications, supercompactifications, completions, etc.)	55M35	Finite groups of transformations (including Smith theory) [See also 57S17]
54D40	Remainders	55M99	None of the above, but in this section
54D45	Local compactness, σ -compactness	55Nxx	Homology and cohomology theories [See also 57Txx]
54D50	k -spaces	55N05	Čech types
54D55	Sequential spaces	55N07	Steenrod-Sitnikov homologies
54D60	Realcompactness and realcompactification	55N10	Singular theory
54D65	Separability	55N15	K -theory [See also 19Lxx] {For algebraic K -theory, see 18F25, 19–XX}
54D70	Base properties	55N20	Generalized (extraordinary) homology and cohomology theories
54D80	Special constructions of spaces (spaces of ultrafilters, etc.)	55N22	Bordism and cobordism theories, formal group laws [See also 14L05, 19L41, 57R75, 57R77, 57R85, 57R90]
54D99	None of the above, but in this section	55N25	Homology with local coefficients, equivariant cohomology
54Exx	Spaces with richer structures	55N30	Sheaf cohomology [See also 18F20, 32C35, 32L10]
54E05	Proximity structures and generalizations	55N32	Orbifold cohomology
54E15	Uniform structures and generalizations	55N33	Intersection homology and cohomology
54E17	Nearness spaces	55N34	Elliptic cohomology
54E18	p -spaces, M -spaces, σ -spaces, etc.	55N35	Other homology theories
54E20	Stratifiable spaces, cosmic spaces, etc.	55N40	Axioms for homology theory and uniqueness theorems
54E25	Semimetric spaces	55N45	Products and intersections
54E30	Moore spaces	55N91	Equivariant homology and cohomology [See also 19L47]

55N99	None of the above, but in this section
55Pxx	Homotopy theory { For simple homotopy type , see 57Q10 }
55P05	Homotopy extension properties, cofibrations
55P10	Homotopy equivalences
55P15	Classification of homotopy type
55P20	Eilenberg-Mac Lane spaces
55P25	Spanier-Whitehead duality
55P30	Eckmann-Hilton duality
55P35	Loop spaces
55P40	Suspensions
55P42	Stable homotopy theory, spectra
55P43	Spectra with additional structure (E_∞ , A_∞ , ring spectra, etc.)
55P45	H -spaces and duals
55P47	Infinite loop spaces
55P48	Loop space machines, operads [See also 18D50]
55P50	String topology
55P55	Shape theory [See also 54C56 , 55Q07]
55P57	Proper homotopy theory
55P60	Localization and completion
55P62	Rational homotopy theory
55P65	Homotopy functors
55P91	Equivariant homotopy theory [See also 19L47]
55P92	Relations between equivariant and nonequivariant homotopy theory
55P99	None of the above, but in this section
55Qxx	Homotopy groups
55Q05	Homotopy groups, general; sets of homotopy classes
55Q07	Shape groups
55Q10	Stable homotopy groups
55Q15	Whitehead products and generalizations
55Q20	Homotopy groups of wedges, joins, and simple spaces
55Q25	Hopf invariants
55Q35	Operations in homotopy groups
55Q40	Homotopy groups of spheres
55Q45	Stable homotopy of spheres
55Q50	J -morphism [See also 19L20]
55Q51	v_n -periodicity
55Q52	Homotopy groups of special spaces
55Q55	Cohomotopy groups
55Q70	Homotopy groups of special types [See also 55N05 , 55N07]
55Q91	Equivariant homotopy groups [See also 19L47]
55Q99	None of the above, but in this section
55Rxx	Fiber spaces and bundles [See also 18F15 , 32Lxx , 46M20 , 57R20 , 57R22 , 57R25]
55R05	Fiber spaces
55R10	Fiber bundles
55R12	Transfer
55R15	Classification
55R20	Spectral sequences and homology of fiber spaces [See also 55Txx]
55R25	Sphere bundles and vector bundles
55R35	Classifying spaces of groups and H -spaces
55R37	Maps between classifying spaces
55R40	Homology of classifying spaces, characteristic classes [See also 57Txx , 57R20]
55R45	Homology and homotopy of BO and BU ; Bott periodicity
55R50	Stable classes of vector space bundles, K -theory [See also 19Lxx] {For algebraic K -theory, see 18F25 , 19-XX }
55R55	Fiberings with singularities
55R60	Microbundles and block bundles [See also 57N55 , 57Q50]
55R65	Generalizations of fiber spaces and bundles
55R70	Fibrewise topology
55R80	Discriminantal varieties, configuration spaces
55R91	Equivariant fiber spaces and bundles [See also 19L47]
55R99	None of the above, but in this section
55Sxx	Operations and obstructions
55S05	Primary cohomology operations
55S10	Steenrod algebra
55S12	Dyer-Lashof operations
55S15	Symmetric products, cyclic products
55S20	Secondary and higher cohomology operations
55S25	K -theory operations and generalized cohomology operations [See also 19D55 , 19Lxx]
55S30	Massey products
55S35	Obstruction theory
55S36	Extension and compression of mappings
55S37	Classification of mappings
55S40	Sectioning fiber spaces and bundles
55S45	Postnikov systems, k -invariants
55S91	Equivariant operations and obstructions [See also 19L47]
55S99	None of the above, but in this section

55Txx	Spectral sequences [See also 18G40 , 55R20]
55T05	General
55T10	Serre spectral sequences
55T15	Adams spectral sequences
55T20	Eilenberg-Moore spectral sequences [See also 57T35]
55T25	Generalized cohomology
55T99	None of the above, but in this section
55Uxx	Applied homological algebra and category theory [See also 18Gxx]
55U05	Abstract complexes
55U10	Simplicial sets and complexes
55U15	Chain complexes
55U20	Universal coefficient theorems, Bockstein operator
55U25	Homology of a product, Künneth formula
55U30	Duality
55U35	Abstract and axiomatic homotopy theory
55U40	Topological categories, foundations of homotopy theory
55U99	None of the above, but in this section
57-XX	MANIFOLDS AND CELL COMPLEXES { For complex manifolds , see 32Qxx }
57-00	General reference works (handbooks, dictionaries, bibliographies, etc.)
57-01	Instructional exposition (textbooks, tutorial papers, etc.)
57-02	Research exposition (monographs, survey articles)
57-03	Historical (must also be assigned at least one classification number from Section 01)
57-04	Explicit machine computation and programs (not the theory of computation or programming)
57-06	Proceedings, conferences, collections, etc.
57Mxx	Low-dimensional topology
57M05	Fundamental group, presentations, free differential calculus
57M07	Topological methods in group theory
57M10	Covering spaces
57M12	Special coverings, e.g. branched
57M15	Relations with graph theory [See also 05Cxx]
57M20	Two-dimensional complexes
57M25	Knots and links in S^3 {For higher dimensions, see 57Q45 }
57M27	Invariants of knots and 3-manifolds
57M30	Wild knots and surfaces, etc., wild embeddings
57M35	Dehn's lemma, sphere theorem, loop theorem, asphericity
57M40	Characterizations of E^3 and S^3 (Poincaré conjecture) [See also 57N12]
57M50	Geometric structures on low-dimensional manifolds
57M60	Group actions in low dimensions
57M99	None of the above, but in this section
57Nxx	Topological manifolds
57N05	Topology of E^2 , 2-manifolds
57N10	Topology of general 3-manifolds [See also 57Mxx]
57N12	Topology of E^3 and S^3 [See also 57M40]
57N13	Topology of E^4 , 4-manifolds [See also 14Jxx , 32Jxx]
57N15	Topology of E^n , n -manifolds ($4 < n < \infty$)
57N16	Geometric structures on manifolds [See also 57M50]
57N17	Topology of topological vector spaces
57N20	Topology of infinite-dimensional manifolds [See also 58Bxx]
57N25	Shapes [See also 54C56 , 55P55 , 55Q07]
57N30	Engulfing
57N35	Embeddings and immersions
57N37	Isotopy and pseudo-isotopy
57N40	Neighborhoods of submanifolds
57N45	Flatness and tameness
57N50	$S^{n-1} \subset E^n$, Schoenflies problem
57N55	Microbundles and block bundles [See also 55R60 , 57Q50]
57N60	Cellularity
57N65	Algebraic topology of manifolds
57N70	Cobordism and concordance
57N75	General position and transversality
57N80	Stratifications
57N99	None of the above, but in this section
57Pxx	Generalized manifolds [See also 18F15]
57P05	Local properties of generalized manifolds
57P10	Poincaré duality spaces
57P99	None of the above, but in this section
57Qxx	PL-topology
57Q05	General topology of complexes
57Q10	Simple homotopy type, Whitehead torsion, Reidemeister-Franz torsion, etc. [See also 19B28]
57Q12	Wall finiteness obstruction for CW-complexes
57Q15	Triangulating manifolds
57Q20	Cobordism
57Q25	Comparison of PL-structures: classification, Hauptvermutung
57Q30	Engulfing

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57Q35	Embeddings and immersions	58–03	Historical (must also be assigned at least one classification number from Section 01)
57Q37	Isotopy	58–04	Explicit machine computation and programs (not the theory of computation or programming)
57Q40	Regular neighborhoods	58–06	Proceedings, conferences, collections, etc.
57Q45	Knots and links (in high dimensions) {For the low-dimensional case, see 57M25 }	58Axx	General theory of differentiable manifolds [See also 32Cxx]
57Q50	Microbundles and block bundles [See also 55R60 , 57N55]	58A03	Topos-theoretic approach to differentiable manifolds
57Q55	Approximations	58A05	Differentiable manifolds, foundations
57Q60	Cobordism and concordance	58A07	Real-analytic and Nash manifolds [See also 14P20 , 32C07]
57Q65	General position and transversality	58A10	Differential forms
57Q91	Equivariant PL-topology	58A12	de Rham theory [See also 14Fxx]
57Q99	None of the above, but in this section	58A14	Hodge theory [See also 14C30 , 14Fxx , 32J25 , 32S35]
57Rxx	Differential topology { For foundational questions of differentiable manifolds, see 58Axx; for infinite-dimensional manifolds, see 58Bxx }	58A15	Exterior differential systems (Cartan theory)
57R05	Triangulating	58A17	Pfaffian systems
57R10	Smoothing	58A20	Jets
57R12	Smooth approximations	58A25	Currents [See also 32C30 , 53C65]
57R15	Specialized structures on manifolds (spin manifolds, framed manifolds, etc.)	58A30	Vector distributions (subbundles of the tangent bundles)
57R17	Symplectic and contact topology	58A32	Natural bundles
57R18	Topology and geometry of orbifolds	58A35	Stratified sets [See also 32S60]
57R19	Algebraic topology on manifolds	58A40	Differential spaces
57R20	Characteristic classes and numbers	58A50	Supermanifolds and graded manifolds [See also 14A22 , 32C11]
57R22	Topology of vector bundles and fiber bundles [See also 55Rxx]	58A99	None of the above, but in this section
57R25	Vector fields, frame fields	58Bxx	Infinite-dimensional manifolds
57R27	Controllability of vector fields on C^∞ and real-analytic manifolds [See also 49Qxx , 37C10 , 93B05]	58B05	Homotopy and topological questions
57R30	Foliations; geometric theory	58B10	Differentiability questions
57R32	Classifying spaces for foliations; Gelfand-Fuks cohomology [See also 58H10]	58B12	Questions of holomorphy [See also 32–XX , 46G20]
57R35	Differentiable mappings	58B15	Fredholm structures [See also 47A53]
57R40	Embeddings	58B20	Riemannian, Finsler and other geometric structures [See also 53C20 , 53C60]
57R42	Immersions	58B25	Group structures and generalizations on infinite-dimensional manifolds [See also 22E65 , 58D05]
57R45	Singularities of differentiable mappings	58B32	Geometry of quantum groups
57R50	Diffeomorphisms	58B34	Noncommutative geometry (à la Connes)
57R52	Isotopy	58B99	None of the above, but in this section
57R55	Differentiable structures	58Cxx	Calculus on manifolds; nonlinear operators [See also 46Txx , 47Hxx , 47Jxx]
57R56	Topological quantum field theories	58C05	Real-valued functions
57R57	Applications of global analysis to structures on manifolds, Donaldson and Seiberg-Witten invariants [See also 58–XX]	58C06	Set valued and function-space valued mappings [See also 47H04 , 54C60]
57R58	Floer homology	58C07	Continuity properties of mappings
57R60	Homotopy spheres, Poincaré conjecture	58C10	Holomorphic maps [See also 32–XX]
57R65	Surgery and handlebodies	58C15	Implicit function theorems; global Newton methods
57R67	Surgery obstructions, Wall groups [See also 19J25]	58C20	Differentiation theory (Gateaux, Fréchet, etc.) [See also 26Exx , 46G05]
57R70	Critical points and critical submanifolds	58C25	Differentiable maps
57R75	O- and SO-cobordism	58C30	Fixed point theorems on manifolds [See also 47H10]
57R77	Complex cobordism (U- and SU-cobordism) [See also 55N22]	58C35	Integration on manifolds; measures on manifolds [See also 28Cxx]
57R80	h - and s -cobordism	58C40	Spectral theory; eigenvalue problems [See also 47J10 , 58E07]
57R85	Equivariant cobordism	58C50	Analysis on supermanifolds or graded manifolds
57R90	Other types of cobordism [See also 55N22]	58C99	None of the above, but in this section
57R91	Equivariant algebraic topology of manifolds	58Dxx	Spaces and manifolds of mappings (including nonlinear versions of 46Exx) [See also 46Txx , 53Cxx]
57R95	Realizing cycles by submanifolds	58D05	Groups of diffeomorphisms and homeomorphisms as manifolds [See also 22E65 , 57S05]
57R99	None of the above, but in this section	58D07	Groups and semigroups of nonlinear operators [See also 17B65 , 47H20]
57Sxx	Topological transformation groups [See also 20F34 , 22–XX , 37–XX , 54H15 , 58D05]	58D10	Spaces of imbeddings and immersions
57S05	Topological properties of groups of homeomorphisms or diffeomorphisms	58D15	Manifolds of mappings [See also 46T10 , 54C35]
57S10	Compact groups of homeomorphisms	58D17	Manifolds of metrics (esp. Riemannian)
57S15	Compact Lie groups of differentiable transformations	58D19	Group actions and symmetry properties
57S17	Finite transformation groups	58D20	Measures (Gaussian, cylindrical, etc.) on manifolds of maps [See also 28Cxx , 46T12]
57S20	Noncompact Lie groups of transformations	58D25	Equations in function spaces; evolution equations [See also 34Gxx , 35K90 , 35L90 , 35R15 , 37Lxx , 47Jxx]
57S25	Groups acting on specific manifolds	58D27	Moduli problems for differential geometric structures
57S30	Discontinuous groups of transformations	58D29	Moduli problems for topological structures
57S99	None of the above, but in this section	58D30	Applications (in quantum mechanics (Feynman path integrals), relativity, fluid dynamics, etc.)
57Txx	Homology and homotopy of topological groups and related structures	58D99	None of the above, but in this section
57T05	Hopf algebras [See also 16T05]	58Exx	Variational problems in infinite-dimensional spaces
57T10	Homology and cohomology of Lie groups	58E05	Abstract critical point theory (Morse theory, Ljusternik-Schnirelman (Lyusternik-Shnirel’man) theory, etc.)
57T15	Homology and cohomology of homogeneous spaces of Lie groups	58E07	Abstract bifurcation theory
57T20	Homotopy groups of topological groups and homogeneous spaces	58E09	Group-invariant bifurcation theory
57T25	Homology and cohomology of H -spaces	58E10	Applications to the theory of geodesics (problems in one independent variable)
57T30	Bar and cobar constructions [See also 18G55 , 55Uxx]	58E11	Critical metrics
57T35	Applications of Eilenberg-Moore spectral sequences [See also 55R20 , 55T20]	58E12	Applications to minimal surfaces (problems in two independent variables) [See also 49Q05]
57T99	None of the above, but in this section		
58–XX	GLOBAL ANALYSIS, ANALYSIS ON MANIFOLDS [See also 32Cxx , 32Fxx , 32Wxx , 46–XX , 47Hxx , 53Cxx]{ For geometric integration theory, see 49Q15 }		
58–00	General reference works (handbooks, dictionaries, bibliographies, etc.)		
58–01	Instructional exposition (textbooks, tutorial papers, etc.)		
58–02	Research exposition (monographs, survey articles)		

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58E15	Application to extremal problems in several variables; Yang-Mills functionals [See also 81T13], etc.	60–04	Explicit machine computation and programs (not the theory of computation or programming)
58E17	Pareto optimality, etc., applications to economics [See also 90C29]	60–06	Proceedings, conferences, collections, etc.
58E20	Harmonic maps [See also 53C43], etc.	60–08	Computational methods (not classified at a more specific level) [See also 65C50]
58E25	Applications to control theory [See also 49–XX , 93–XX]	60Axx	Foundations of probability theory
58E30	Variational principles	60A05	Axioms; other general questions
58E35	Variational inequalities (global problems)	60A10	Probabilistic measure theory {For ergodic theory, see 28Dxx and 60Fxx }
58E40	Group actions	60A86	Fuzzy probability
58E50	Applications	60A99	None of the above, but in this section
58E99	None of the above, but in this section	60Bxx	Probability theory on algebraic and topological structures
58Hxx	Pseudogroups, differentiable groupoids and general structures on manifolds	60B05	Probability measures on topological spaces
58H05	Pseudogroups and differentiable groupoids [See also 22A22 , 22E65]	60B10	Convergence of probability measures
58H10	Cohomology of classifying spaces for pseudogroup structures (Spencer, Gelfand-Fuks, etc.) [See also 57R32]	60B11	Probability theory on linear topological spaces [See also 28C20]
58H15	Deformations of structures [See also 32Gxx , 58J10]	60B12	Limit theorems for vector-valued random variables (infinite-dimensional case)
58H99	None of the above, but in this section	60B15	Probability measures on groups or semigroups, Fourier transforms, factorization
58Jxx	Partial differential equations on manifolds; differential operators [See also 32Wxx, 35–XX, 53Cxx]	60B20	Random matrices (probabilistic aspects; for algebraic aspects see 15B52)
58J05	Elliptic equations on manifolds, general theory [See also 35–XX]	60B99	None of the above, but in this section
58J10	Differential complexes [See also 35Nxx]; elliptic complexes	60Cxx	Combinatorial probability
58J15	Relations with hyperfunctions	60C05	Combinatorial probability
58J20	Index theory and related fixed point theorems [See also 19K56 , 46L80]	60C99	None of the above, but in this section
58J22	Exotic index theories [See also 19K56 , 46L05 , 46L10 , 46L80 , 46M20]	60Dxx	Geometric probability and stochastic geometry [See also 52A22, 53C65]
58J26	Elliptic genera	60D05	Geometric probability and stochastic geometry [See also 52A22 , 53C65]
58J28	Eta-invariants, Chern-Simons invariants	60D99	None of the above, but in this section
58J30	Spectral flows	60Exx	Distribution theory [See also 62Exx, 62Hxx]
58J32	Boundary value problems on manifolds	60E05	Distributions: general theory
58J35	Heat and other parabolic equation methods	60E07	Infinitely divisible distributions; stable distributions
58J37	Perturbations; asymptotics	60E10	Characteristic functions; other transforms
58J40	Pseudodifferential and Fourier integral operators on manifolds [See also 35Sxx]	60E15	Inequalities; stochastic orderings
58J42	Noncommutative global analysis, noncommutative residues	60E99	None of the above, but in this section
58J45	Hyperbolic equations [See also 35Lxx]	60Fxx	Limit theorems [See also 28Dxx, 60B12]
58J47	Propagation of singularities; initial value problems	60F05	Central limit and other weak theorems
58J50	Spectral problems; spectral geometry; scattering theory [See also 35Pxx]	60F10	Large deviations
58J51	Relations between spectral theory and ergodic theory, e.g. quantum unique ergodicity	60F15	Strong theorems
58J52	Determinants and determinant bundles, analytic torsion	60F17	Functional limit theorems; invariance principles
58J53	Isospectrality	60F20	Zero-one laws
58J55	Bifurcation [See also 35B32]	60F25	L^p -limit theorems
58J60	Relations with special manifold structures (Riemannian, Finsler, etc.)	60F99	None of the above, but in this section
58J65	Diffusion processes and stochastic analysis on manifolds [See also 35R60 , 60H10 , 60J60]	60Gxx	Stochastic processes
58J70	Invariance and symmetry properties [See also 35A30]	60G05	Foundations of stochastic processes
58J72	Correspondences and other transformation methods (e.g. Lie-Bäcklund) [See also 35A22]	60G07	General theory of processes
58J90	Applications	60G09	Exchangeability
58J99	None of the above, but in this section	60G10	Stationary processes
58Kxx	Theory of singularities and catastrophe theory [See also 32Sxx, 37–XX]	60G12	General second-order processes
58K05	Critical points of functions and mappings	60G15	Gaussian processes
58K10	Monodromy	60G17	Sample path properties
58K15	Topological properties of mappings	60G18	Self-similar processes
58K20	Algebraic and analytic properties of mappings	60G20	Generalized stochastic processes
58K25	Stability	 60G22	Fractional processes, including fractional Brownian motion
58K30	Global theory	60G25	Prediction theory [See also 62M20]
58K35	Catastrophe theory	60G30	Continuity and singularity of induced measures
58K40	Classification; finite determinacy of map germs	60G35	Signal detection and filtering [See also 62M20 , 93E10 , 93E11 , 94Axx]
58K45	Singularities of vector fields, topological aspects	60G40	Stopping times; optimal stopping problems; gambling theory [See also 62L15 , 91A60]
58K50	Normal forms	60G42	Martingales with discrete parameter
58K55	Asymptotic behavior	60G44	Martingales with continuous parameter
58K60	Deformation of singularities	60G46	Martingales and classical analysis
58K65	Topological invariants	60G48	Generalizations of martingales
58K70	Symmetries, equivariance	60G50	Sums of independent random variables; random walks
58K99	None of the above, but in this section	60G51	Processes with independent increments; Lévy processes
58Zxx	Applications to physics	60G52	Stable processes
58Z05	Applications to physics	60G55	Point processes
58Z99	None of the above, but in this section	60G57	Random measures
60–XX	PROBABILITY THEORY AND STOCHASTIC PROCESSES {For additional applications, see 11Kxx, 62–XX, 90–XX, 91–XX, 92–XX, 93–XX, 94–XX}	60G60	Random fields
60–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	60G70	Extreme value theory; extremal processes
60–01	Instructional exposition (textbooks, tutorial papers, etc.)	60G99	None of the above, but in this section
60–02	Research exposition (monographs, survey articles)	60Hxx	Stochastic analysis [See also 58J65]
60–03	Historical (must also be assigned at least one classification number from Section 01)	60H05	Stochastic integrals
		60H07	Stochastic calculus of variations and the Malliavin calculus
		60H10	Stochastic ordinary differential equations [See also 34F05]
		60H15	Stochastic partial differential equations [See also 35R60]
		60H20	Stochastic integral equations
		60H25	Random operators and equations [See also 47B80]
		60H30	Applications of stochastic analysis (to PDE, etc.)

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60H35	Computational methods for stochastic equations [See also 65C30]	62Dxx	Sampling theory, sample surveys
60H40	White noise theory	62D05	Sampling theory, sample surveys
60H99	None of the above, but in this section	62D99	None of the above, but in this section
60Jxx	Markov processes	62Exx	Distribution theory [See also 60Exx]
60J05	Discrete-time Markov processes on general state spaces	62E10	Characterization and structure theory
60J10	Markov chains (discrete-time Markov processes on discrete state spaces)	62E15	Exact distribution theory
60J20	Applications of Markov chains and discrete-time Markov processes on general state spaces (social mobility, learning theory, industrial processes, etc.) [See also 90B30, 91D10, 91D35, 91E40]	62E17	Approximations to distributions (nonasymptotic)
60J22	Computational methods in Markov chains [See also 65C40]	62E20	Asymptotic distribution theory
60J25	Continuous-time Markov processes on general state spaces	62E86	Fuzziness in connection with the topics on distributions in this section
60J27	Continuous-time Markov processes on discrete state spaces	62E99	None of the above, but in this section
60J28	Applications of continuous-time Markov processes on discrete state spaces	62Fxx	Parametric inference
60J35	Transition functions, generators and resolvents [See also 47D03, 47D07]	62F03	Hypothesis testing
60J40	Right processes	62F05	Asymptotic properties of tests
60J45	Probabilistic potential theory [See also 31Cxx, 31D05]	62F07	Ranking and selection
60J50	Boundary theory	62F10	Point estimation
60J55	Local time and additive functionals	62F12	Asymptotic properties of estimators
60J57	Multiplicative functionals	62F15	Bayesian inference
60J60	Diffusion processes [See also 58J65]	62F25	Tolerance and confidence regions
60J65	Brownian motion [See also 58J65]	62F30	Inference under constraints
60J67	Stochastic (Schramm-)Loewner evolution (SLE)	62F35	Robustness and adaptive procedures
60J68	Superprocesses	62F40	Bootstrap, jackknife and other resampling methods
60J70	Applications of Brownian motions and diffusion theory (population genetics, absorption problems, etc.) [See also 92Dxx]	62F86	Parametric inference and fuzziness
60J75	Jump processes	62F99	None of the above, but in this section
60J80	Branching processes (Galton-Watson, birth-and-death, etc.)	62Gxx	Nonparametric inference
60J85	Applications of branching processes [See also 92Dxx]	62G05	Estimation
60J99	None of the above, but in this section	62G07	Density estimation
60Kxx	Special processes	62G08	Nonparametric regression
60K05	Renewal theory	62G09	Resampling methods
60K10	Applications (reliability, demand theory, etc.)	62G10	Hypothesis testing
60K15	Markov renewal processes, semi-Markov processes	62G15	Tolerance and confidence regions
60K20	Applications of Markov renewal processes (reliability, queueing networks, etc.) [See also 90Bxx]	62G20	Asymptotic properties
60K25	Queueing theory [See also 68M20, 90B22]	62G30	Order statistics; empirical distribution functions
60K30	Applications (congestion, allocation, storage, traffic, etc.) [See also 90Bxx]	62G32	Statistics of extreme values; tail inference
60K35	Interacting random processes; statistical mechanics type models; percolation theory [See also 82B43, 82C43]	62G35	Robustness
60K37	Processes in random environments	62G86	Nonparametric inference and fuzziness
60K40	Other physical applications of random processes	62G99	None of the above, but in this section
60K99	None of the above, but in this section	62Hxx	Multivariate analysis [See also 60Exx]
62-XX	STATISTICS	62H05	Characterization and structure theory
62-00	General reference works (handbooks, dictionaries, bibliographies, etc.)	62H10	Distribution of statistics
62-01	Instructional exposition (textbooks, tutorial papers, etc.)	62H11	Directional data; spatial statistics
62-02	Research exposition (monographs, survey articles)	62H12	Estimation
62-03	Historical (must also be assigned at least one classification number from Section 01)	62H15	Hypothesis testing
62-04	Explicit machine computation and programs (not the theory of computation or programming)	62H17	Contingency tables
62-06	Proceedings, conferences, collections, etc.	62H20	Measures of association (correlation, canonical correlation, etc.)
62-07	Data analysis	62H25	Factor analysis and principal components; correspondence analysis
62-09	Graphical methods	62H30	Classification and discrimination; cluster analysis [See also 68T10, 91C20]
62Axx	Foundational and philosophical topics	62H35	Image analysis
62A01	Foundations and philosophical topics	62H86	Multivariate analysis and fuzziness
62A86	Fuzzy analysis in statistics	62H99	None of the above, but in this section
62A99	None of the above, but in this section	62Jxx	Linear inference, regression
62Bxx	Sufficiency and information	62J02	General nonlinear regression
62B05	Sufficient statistics and fields	62J05	Linear regression
62B10	Information-theoretic topics [See also 94A17]	62J07	Ridge regression; shrinkage estimators
62B15	Theory of statistical experiments	62J10	Analysis of variance and covariance
62B86	Fuzziness, sufficiency, and information	62J12	Generalized linear models
62B99	None of the above, but in this section	62J15	Paired and multiple comparisons
62Cxx	Decision theory [See also 90B50, 91B06; for game theory, see 91A35]	62J20	Diagnostics
62C05	General considerations	62J86	Fuzziness, and linear inference and regression
62C07	Complete class results	62J99	None of the above, but in this section
62C10	Bayesian problems; characterization of Bayes procedures	62Kxx	Design of experiments [See also 05Bxx]
62C12	Empirical decision procedures; empirical Bayes procedures	62K05	Optimal designs
62C15	Admissibility	62K10	Block designs
62C20	Minimax procedures	62K15	Factorial designs
62C25	Compound decision problems	62K20	Response surface designs
62C86	Decision theory and fuzziness	62K25	Robust parameter designs
62C99	None of the above, but in this section	62K86	Fuzziness and design of experiments
		62K99	None of the above, but in this section
		62Lxx	Sequential methods
		62L05	Sequential design
		62L10	Sequential analysis
		62L12	Sequential estimation
		62L15	Optimal stopping [See also 60G40, 91A60]
		62L20	Stochastic approximation
		62L86	Fuzziness and sequential methods
		62L99	None of the above, but in this section

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62Mxx	Inference from stochastic processes
62M02	Markov processes: hypothesis testing
62M05	Markov processes: estimation
62M07	Non-Markovian processes: hypothesis testing
62M09	Non-Markovian processes: estimation
62M10	Time series, auto-correlation, regression, etc. [See also 91B84]
62M15	Spectral analysis
62M20	Prediction [See also 60G25]; filtering [See also 60G35 , 93E10 , 93E11]
62M30	Spatial processes
62M40	Random fields; image analysis
62M45	Neural nets and related approaches
62M86	Inference from stochastic processes and fuzziness
62M99	None of the above, but in this section
62Nxx	Survival analysis and censored data
62N01	Censored data models
62N02	Estimation
62N03	Testing
62N05	Reliability and life testing [See also 90B25]
62N86	Fuzziness, and survival analysis and censored data
62N99	None of the above, but in this section
62Pxx	Applications [See also 90–XX , 91–XX , 92–XX]
62P05	Applications to actuarial sciences and financial mathematics
62P10	Applications to biology and medical sciences
62P12	Applications to environmental and related topics
62P15	Applications to psychology
62P20	Applications to economics [See also 91Bxx]
62P25	Applications to social sciences
62P30	Applications in engineering and industry
62P35	Applications to physics
62P99	None of the above, but in this section
62Qxx	Statistical tables
62Q05	Statistical tables
62Q99	None of the above, but in this section
65–XX	NUMERICAL ANALYSIS
65–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
65–01	Instructional exposition (textbooks, tutorial papers, etc.)
65–02	Research exposition (monographs, survey articles)
65–03	Historical (must also be assigned at least one classification number from Section 01)
65–04	Explicit machine computation and programs (not the theory of computation or programming)
65–05	Experimental papers
65–06	Proceedings, conferences, collections, etc.
65Axx	Tables
65A05	Tables
65A99	None of the above, but in this section
65Bxx	Acceleration of convergence
65B05	Extrapolation to the limit, deferred corrections
65B10	Summation of series
65B15	Euler-Maclaurin formula
65B99	None of the above, but in this section
65Cxx	Probabilistic methods, simulation and stochastic differential equations { For theoretical aspects, see 68U20 and 60H35 }
65C05	Monte Carlo methods
65C10	Random number generation
65C20	Models, numerical methods [See also 68U20]
65C30	Stochastic differential and integral equations
65C35	Stochastic particle methods [See also 82C80]
65C40	Computational Markov chains
65C50	Other computational problems in probability
65C60	Computational problems in statistics
65C99	None of the above, but in this section
65Dxx	Numerical approximation and computational geometry (primarily algorithms) { For theory, see 41–XX and 68Uxx }
65D05	Interpolation
65D07	Splines
65D10	Smoothing, curve fitting
65D15	Algorithms for functional approximation
65D17	Computer aided design (modeling of curves and surfaces) [See also 68U07]
65D18	Computer graphics, image analysis, and computational geometry [See also 51N05 , 68U05]
65D19	Computational issues in computer and robotic vision
65D20	Computation of special functions, construction of tables [See also 33F05]
65D25	Numerical differentiation
65D30	Numerical integration
65D32	Quadrature and cubature formulas
65D99	None of the above, but in this section

65Exx	Numerical methods in complex analysis (potential theory, etc.) { For numerical methods in conformal mapping, see also 30C30 }
65E05	Numerical methods in complex analysis (potential theory, etc.) {For numerical methods in conformal mapping, see also 30C30 }
65E99	None of the above, but in this section
65Fxx	Numerical linear algebra
65F05	Direct methods for linear systems and matrix inversion
65F08	Preconditioners for iterative methods
65F10	Iterative methods for linear systems [See also 65N22]
65F15	Eigenvalues, eigenvectors
65F18	Inverse eigenvalue problems
65F20	Overdetermined systems, pseudoinverses
65F22	Ill-posedness, regularization
65F25	Orthogonalization
65F30	Other matrix algorithms
65F35	Matrix norms, conditioning, scaling [See also 15A12 , 15A60]
65F40	Determinants
65F50	Sparse matrices
65F60	Matrix exponential and similar matrix functions
65F99	None of the above, but in this section
65Gxx	Error analysis and interval analysis
65G20	Algorithms with automatic result verification
65G30	Interval and finite arithmetic
65G40	General methods in interval analysis
65G50	Roundoff error
65G99	None of the above, but in this section
65Hxx	Nonlinear algebraic or transcendental equations
65H04	Roots of polynomial equations
65H05	Single equations
65H10	Systems of equations
65H17	Eigenvalues, eigenvectors [See also 47Hxx , 47Jxx , 58C40 , 58E07 , 90C30]
65H20	Global methods, including homotopy approaches [See also 58C30 , 90C30]
65H99	None of the above, but in this section
65Jxx	Numerical analysis in abstract spaces
65J05	General theory
65J08	Abstract evolution equations
65J10	Equations with linear operators (do not use 65Fxx)
65J15	Equations with nonlinear operators (do not use 65Hxx)
65J20	Improperly posed problems; regularization
65J22	Inverse problems
65J99	None of the above, but in this section
65Kxx	Mathematical programming, optimization and variational techniques
65K05	Mathematical programming methods [See also 90Cxx]
65K10	Optimization and variational techniques [See also 49Mxx , 93B40]
65K15	Numerical methods for variational inequalities and related problems
65K99	None of the above, but in this section
65Lxx	Ordinary differential equations
65L03	Functional-differential equations
65L04	Stiff equations
65L05	Initial value problems
65L06	Multistep, Runge-Kutta and extrapolation methods
65L07	Numerical investigation of stability of solutions
65L08	Improperly posed problems
65L09	Inverse problems
65L10	Boundary value problems
65L11	Singularly perturbed problems
65L12	Finite difference methods
65L15	Eigenvalue problems
65L20	Stability and convergence of numerical methods
65L50	Mesh generation and refinement
65L60	Finite elements, Rayleigh-Ritz, Galerkin and collocation methods
65L70	Error bounds
65L80	Methods for differential-algebraic equations
65L99	None of the above, but in this section
65Mxx	Partial differential equations, initial value and time-dependent initial-boundary value problems
65M06	Finite difference methods
65M08	Finite volume methods
65M12	Stability and convergence of numerical methods
65M15	Error bounds
65M20	Method of lines
65M22	Solution of discretized equations [See also 65Fxx , 65Hxx]
65M25	Method of characteristics
65M30	Improperly posed problems
65M32	Inverse problems
65M38	Boundary element methods
65M50	Mesh generation and refinement
65M55	Multigrid methods; domain decomposition

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65M60	Finite elements, Rayleigh-Ritz and Galerkin methods, finite methods	68M14	Distributed systems
65M70	Spectral, collocation and related methods	68M15	Reliability, testing and fault tolerance [See also 94C12]
65M75	Probabilistic methods, particle methods, etc.	68M20	Performance evaluation; queueing; scheduling [See also 60K25 , 90Bxx]
65M80	Fundamental solutions, Green’s function methods, etc.	68M99	None of the above, but in this section
65M85	Fictitious domain methods	68Nxx	Software
65M99	None of the above, but in this section	68N01	General
65Nxx	Partial differential equations, boundary value problems	68N15	Programming languages
65N06	Finite difference methods	68N17	Logic programming
65N08	Finite volume methods	68N18	Functional programming and lambda calculus [See also 03B40]
65N12	Stability and convergence of numerical methods	68N19	Other programming techniques (object-oriented, sequential, concurrent, automatic, etc.)
65N15	Error bounds	68N20	Compilers and interpreters
65N20	Ill-posed problems	68N25	Operating systems
65N21	Inverse problems	68N30	Mathematical aspects of software engineering (specification, verification, metrics, requirements, etc.)
65N22	Solution of discretized equations [See also 65Fxx , 65Hxx]	68N99	None of the above, but in this section
65N25	Eigenvalue problems	68Pxx	Theory of data
65N30	Finite elements, Rayleigh-Ritz and Galerkin methods, finite methods	68P01	General
65N35	Spectral, collocation and related methods	68P05	Data structures
65N38	Boundary element methods	68P10	Searching and sorting
65N40	Method of lines	68P15	Database theory
65N45	Method of contraction of the boundary	68P20	Information storage and retrieval
65N50	Mesh generation and refinement	68P25	Data encryption [See also 94A60 , 81P94]
65N55	Multigrid methods; domain decomposition	68P30	Coding and information theory (compaction, compression, models of communication, encoding schemes, etc.) [See also 94Axx]
65N75	Probabilistic methods, particle methods, etc.	68P99	None of the above, but in this section
65N80	Fundamental solutions, Green’s function methods, etc.	68Qxx	Theory of computing
65N85	Fictitious domain methods	68Q01	General
65N99	None of the above, but in this section	68Q05	Models of computation (Turing machines, etc.) [See also 03D10 , 68Q12 , 81P68]
65Pxx	Numerical problems in dynamical systems [See also 37Mxx]	68Q10	Modes of computation (nondeterministic, parallel, interactive, probabilistic, etc.) [See also 68Q85]
65P10	Hamiltonian systems including symplectic integrators	68Q12	Quantum algorithms and complexity [See also 68Q05 , 81P68]
65P20	Numerical chaos	68Q15	Complexity classes (hierarchies, relations among complexity classes, etc.) [See also 03D15 , 68Q17 , 68Q19]
65P30	Bifurcation problems	68Q17	Computational difficulty of problems (lower bounds, completeness, difficulty of approximation, etc.) [See also 68Q15]
65P40	Nonlinear stabilities	68Q19	Descriptive complexity and finite models [See also 03C13]
65P99	None of the above, but in this section	68Q25	Analysis of algorithms and problem complexity [See also 68W40]
65Qxx	Difference and functional equations, recurrence relations	68Q30	Algorithmic information theory (Kolmogorov complexity, etc.) [See also 03D32]
65Q10	Difference equations	68Q32	Computational learning theory [See also 68T05]
65Q20	Functional equations	68Q42	Grammars and rewriting systems
65Q30	Recurrence relations	68Q45	Formal languages and automata [See also 03D05 , 68Q70 , 94A45]
65Q99	None of the above, but in this section	68Q55	Semantics [See also 03B70 , 06B35 , 18C50]
65Rxx	Integral equations, integral transforms	68Q60	Specification and verification (program logics, model checking, etc.) [See also 03B70]
65R10	Integral transforms	68Q65	Abstract data types; algebraic specification [See also 18C50]
65R20	Integral equations	68Q70	Algebraic theory of languages and automata [See also 18B20 , 20M35]
65R30	Improperly posed problems	68Q80	Cellular automata [See also 37B15]
65R32	Inverse problems	68Q85	Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)
65R99	None of the above, but in this section	68Q87	Probability in computer science (algorithm analysis, random structures, phase transitions, etc.) [See also 68W20 , 68W40]
65Sxx	Graphical methods	68Q99	None of the above, but in this section
65S05	Graphical methods	68Rxx	Discrete mathematics in relation to computer science
65S99	None of the above, but in this section	68R01	General
65Txx	Numerical methods in Fourier analysis	68R05	Combinatorics
65T40	Trigonometric approximation and interpolation	68R10	Graph theory (including graph drawing) [See also 05Cxx , 90B10 , 90B35 , 90C35]
65T50	Discrete and fast Fourier transforms	68R15	Combinatorics on words
65T60	Wavelets	68R99	None of the above, but in this section
65T99	None of the above, but in this section	68Txx	Artificial intelligence
65Yxx	Computer aspects of numerical algorithms	68T01	General
65Y04	Algorithms for computer arithmetic, etc. [See also 68M07]	68T05	Learning and adaptive systems [See also 68Q32 , 91E40]
65Y05	Parallel computation	68T10	Pattern recognition, speech recognition {For cluster analysis, see 62H30 }
65Y10	Algorithms for specific classes of architectures	68T15	Theorem proving (deduction, resolution, etc.) [See also 03B35]
65Y15	Packaged methods	68T20	Problem solving (heuristics, search strategies, etc.)
65Y20	Complexity and performance of numerical algorithms [See also 68Q25]	68T27	Logic in artificial intelligence
65Y99	None of the above, but in this section	68T30	Knowledge representation
65Zxx	Applications to physics	68T35	Languages and software systems (knowledge-based systems, expert systems, etc.)
65Z05	Applications to physics	68T37	Reasoning under uncertainty
65Z99	None of the above, but in this section	68T40	Robotics [See also 93C85]
68–XX	COMPUTER SCIENCE {For papers involving machine computations and programs in a specific mathematical area, see Section–04 in that area}	68T42	Agent technology
68–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	68T45	Machine vision and scene understanding
68–01	Instructional exposition (textbooks, tutorial papers, etc.)	68T50	Natural language processing [See also 03B65]
68–02	Research exposition (monographs, survey articles)	68T99	None of the above, but in this section
68–03	Historical (must also be assigned at least one classification number from Section 01)		
68–04	Explicit machine computation and programs (not the theory of computation or programming)		
68–06	Proceedings, conferences, collections, etc.		
68Mxx	Computer system organization		
68M01	General		
68M07	Mathematical problems of computer architecture		
68M10	Network design and communication [See also 68R10 , 90B18]		
68M11	Internet topics [See also 68U35]		
68M12	Network protocols		

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68Uxx	Computing methodologies and applications	70Gxx	General models, approaches, and methods [See also 37–XX]
68U01	General	70G10	Generalized coordinates; event, impulse-energy, configuration, state, or phase space
68U05	Computer graphics; computational geometry [See also 65D18]	70G40	Topological and differential-topological methods
68U07	Computer-aided design [See also 65D17]	70G45	Differential-geometric methods (tensors, connections, symplectic, Poisson, contact, Riemannian, nonholonomic, etc.) [See also 53Cxx , 53Dxx , 58Axx]
68U10	Image processing	70G55	Algebraic geometry methods
68U15	Text processing; mathematical typography	70G60	Dynamical systems methods
68U20	Simulation [See also 65Cxx]	70G65	Symmetries, Lie-group and Lie-algebra methods
68U35	Information systems (hypertext navigation, interfaces, decision support, etc.) [See also 68M11]	70G70	Functional-analytic methods
68U99	None of the above, but in this section	70G75	Variational methods
68Wxx	Algorithms {For numerical algorithms, see 65–XX ; for combinatorics and graph theory, see 05C85 , 68Rxx }	70G99	None of the above, but in this section
68W01	General	70Hxx	Hamiltonian and Lagrangian mechanics [See also 37Jxx]
68W05	Nonnumerical algorithms	70H03	Lagrange’s equations
68W10	Parallel algorithms	70H05	Hamilton’s equations
68W15	Distributed algorithms	70H06	Completely integrable systems and methods of integration
68W20	Randomized algorithms	70H07	Nonintegrable systems
68W25	Approximation algorithms	70H08	Nearly integrable Hamiltonian systems, KAM theory
68W27	Online algorithms	70H09	Perturbation theories
68W30	Symbolic computation and algebraic computation [See also 11Yxx , 12Y05 , 13Pxx , 14Qxx , 16Z05 , 17–08 , 33F10]	70H11	Adiabatic invariants
68W32	Algorithms on strings	70H12	Periodic and almost periodic solutions
68W35	VLSI algorithms	70H14	Stability problems
68W40	Analysis of algorithms [See also 68Q25]	70H15	Canonical and symplectic transformations
68W99	None of the above, but in this section	70H20	Hamilton-Jacobi equations
70–XX	MECHANICS OF PARTICLES AND SYSTEMS {For relativistic mechanics, see 83A05 and 83C10 ; for statistical mechanics, see 82–XX }	70H25	Hamilton’s principle
70–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	70H30	Other variational principles
70–01	Instructional exposition (textbooks, tutorial papers, etc.)	70H33	Symmetries and conservation laws, reverse symmetries, invariant manifolds and their bifurcations, reduction
70–02	Research exposition (monographs, survey articles)	70H40	Relativistic dynamics
70–03	Historical (must also be assigned at least one classification number from Section 01)	70H45	Constrained dynamics, Dirac’s theory of constraints [See also 70F20 , 70F25 , 70Gxx]
70–04	Explicit machine computation and programs (not the theory of computation or programming)	70H50	Higher-order theories
70–05	Experimental work	70H99	None of the above, but in this section
70–06	Proceedings, conferences, collections, etc.	70Jxx	Linear vibration theory
70–08	Computational methods	70J10	Modal analysis
70Axx	Axiomatics, foundations	70J25	Stability
70A05	Axiomatics, foundations	70J30	Free motions
70A99	None of the above, but in this section	70J35	Forced motions
70Bxx	Kinematics [See also 53A17]	70J40	Parametric resonances
70B05	Kinematics of a particle	70J50	Systems arising from the discretization of structural vibration problems
70B10	Kinematics of a rigid body	70J99	None of the above, but in this section
70B15	Mechanisms, robots [See also 68T40 , 70Q05 , 93C85]	70Kxx	Nonlinear dynamics [See also 34Cxx , 37–XX]
70B99	None of the above, but in this section	70K05	Phase plane analysis, limit cycles
70Cxx	Statics	70K20	Stability
70C20	Statics	70K25	Free motions
70C99	None of the above, but in this section	70K28	Parametric resonances
70Exx	Dynamics of a rigid body and of multibody systems	70K30	Nonlinear resonances
70E05	Motion of the gyroscope	70K40	Forced motions
70E15	Free motion of a rigid body [See also 70M20]	70K42	Equilibria and periodic trajectories
70E17	Motion of a rigid body with a fixed point	70K43	Quasi-periodic motions and invariant tori
70E18	Motion of a rigid body in contact with a solid surface [See also 70F25]	70K44	Homoclinic and heteroclinic trajectories
70E20	Perturbation methods for rigid body dynamics	70K45	Normal forms
70E40	Integrable cases of motion	70K50	Bifurcations and instability
70E45	Higher-dimensional generalizations	70K55	Transition to stochasticity (chaotic behavior) [See also 37D45]
70E50	Stability problems	70K60	General perturbation schemes
70E55	Dynamics of multibody systems	70K65	Averaging of perturbations
70E60	Robot dynamics and control [See also 68T40 , 70Q05 , 93C85]	70K70	Systems with slow and fast motions
70E99	None of the above, but in this section	70K75	Nonlinear modes
70Fxx	Dynamics of a system of particles, including celestial mechanics	70K99	None of the above, but in this section
70F05	Two-body problems	70Lxx	Random vibrations [See also 74H50]
70F07	Three-body problems	70L05	Random vibrations [See also 74H50]
70F10	<i>n</i> -body problems	70L99	None of the above, but in this section
70F15	Celestial mechanics	70Mxx	Orbital mechanics
70F16	Collisions in celestial mechanics, regularization	70M20	Orbital mechanics
70F17	Inverse problems	70M99	None of the above, but in this section
70F20	Holonomic systems	70Pxx	Variable mass, rockets
70F25	Nonholonomic systems	70P05	Variable mass, rockets
70F35	Collision of rigid or pseudo-rigid bodies	70P99	None of the above, but in this section
70F40	Problems with friction	70Qxx	Control of mechanical systems [See also 60Gxx , 60Jxx]
70F45	Infinite particle systems	70Q05	Control of mechanical systems [See also 60Gxx , 60Jxx]
70F99	None of the above, but in this section	70Q99	None of the above, but in this section
		70Sxx	Classical field theories [See also 37Kxx , 37Lxx , 78–XX , 81Txx , 83–XX]
		70S05	Lagrangian formalism and Hamiltonian formalism
		70S10	Symmetries and conservation laws
		70S15	Yang-Mills and other gauge theories
		70S20	More general nonquantum field theories
		70S99	None of the above, but in this section

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74–XX	MECHANICS OF DEFORMABLE SOLIDS	74G60	Bifurcation and buckling
74–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	74G65	Energy minimization
74–01	Instructional exposition (textbooks, tutorial papers, etc.)	74G70	Stress concentrations, singularities
74–02	Research exposition (monographs, survey articles)	74G75	Inverse problems
74–03	Historical (must also be assigned at least one classification number from Section 01)	74G99	None of the above, but in this section
74–04	Explicit machine computation and programs (not the theory of computation or programming)	74Hxx	Dynamical problems
74–05	Experimental work	74H05	Explicit solutions
74–06	Proceedings, conferences, collections, etc.	74H10	Analytic approximation of solutions (perturbation methods, asymptotic methods, series, etc.)
74Axx	Generalities, axiomatics, foundations of continuum mechanics of solids	74H15	Numerical approximation of solutions
74A05	Kinematics of deformation	74H20	Existence of solutions
74A10	Stress	74H25	Uniqueness of solutions
74A15	Thermodynamics	74H30	Regularity of solutions
74A20	Theory of constitutive functions	74H35	Singularities, blowup, stress concentrations
74A25	Molecular, statistical, and kinetic theories	74H40	Long-time behavior of solutions
74A30	Nonsimple materials	74H45	Vibrations
74A35	Polar materials	74H50	Random vibrations
74A40	Random materials and composite materials	74H55	Stability
74A45	Theories of fracture and damage	74H60	Dynamical bifurcation
74A50	Structured surfaces and interfaces, coexistent phases	74H65	Chaotic behavior
74A55	Theories of friction (tribology)	74H99	None of the above, but in this section
74A60	Micromechanical theories	74Jxx	Waves
74A65	Reactive materials	74J05	Linear waves
74A99	None of the above, but in this section	74J10	Bulk waves
74Bxx	Elastic materials	74J15	Surface waves
74B05	Classical linear elasticity	74J20	Wave scattering
74B10	Linear elasticity with initial stresses	74J25	Inverse problems
74B15	Equations linearized about a deformed state (small deformations superposed on large)	74J30	Nonlinear waves
74B20	Nonlinear elasticity	74J35	Solitary waves
74B99	None of the above, but in this section	74J40	Shocks and related discontinuities
74Cxx	Plastic materials, materials of stress-rate and internal-variable type	74J99	None of the above, but in this section
74C05	Small-strain, rate-independent theories (including rigid-plastic and elasto-plastic materials)	74Kxx	Thin bodies, structures
74C10	Small-strain, rate-dependent theories (including theories of viscoplasticity)	74K05	Strings
74C15	Large-strain, rate-independent theories (including nonlinear plasticity)	74K10	Rods (beams, columns, shafts, arches, rings, etc.)
74C20	Large-strain, rate-dependent theories	74K15	Membranes
74C99	None of the above, but in this section	74K20	Plates
74Dxx	Materials of strain-rate type and history type, other materials with memory (including elastic materials with viscous damping, various viscoelastic materials)	74K25	Shells
74D05	Linear constitutive equations	74K30	Junctions
74D10	Nonlinear constitutive equations	74K35	Thin films
74D99	None of the above, but in this section	74K99	None of the above, but in this section
74Exx	Material properties given special treatment	74Lxx	Special subfields of solid mechanics
74E05	Inhomogeneity	74L05	Geophysical solid mechanics [See also 86–XX]
74E10	Anisotropy	74L10	Soil and rock mechanics
74E15	Crystalline structure	74L15	Biomechanical solid mechanics [See also 92C10]
74E20	Granularity	74L99	None of the above, but in this section
74E25	Texture	74Mxx	Special kinds of problems
74E30	Composite and mixture properties	74M05	Control, switches and devices (“smart materials”) [See also 93Cxx]
74E35	Random structure	74M10	Friction
74E40	Chemical structure	74M15	Contact
74E99	None of the above, but in this section	74M20	Impact
74Fxx	Coupling of solid mechanics with other effects	74M25	Micromechanics
74F05	Thermal effects	74M99	None of the above, but in this section
74F10	Fluid-solid interactions (including aero- and hydro-elasticity, porosity, etc.)	74Nxx	Phase transformations in solids [See also 74A50, 80Axx, 82B26, 82C26]
74F15	Electromagnetic effects	74N05	Crystals
74F20	Mixture effects	74N10	Displacive transformations
74F25	Chemical and reactive effects	74N15	Analysis of microstructure
74F99	None of the above, but in this section	74N20	Dynamics of phase boundaries
74Gxx	Equilibrium (steady-state) problems	74N25	Transformations involving diffusion
74G05	Explicit solutions	74N30	Problems involving hysteresis
74G10	Analytic approximation of solutions (perturbation methods, asymptotic methods, series, etc.)	74N99	None of the above, but in this section
74G15	Numerical approximation of solutions	74Pxx	Optimization [See also 49Qxx]
74G20	Local existence of solutions (near a given solution)	74P05	Compliance or weight optimization
74G25	Global existence of solutions	74P10	Optimization of other properties
74G30	Uniqueness of solutions	74P15	Topological methods
74G35	Multiplicity of solutions	74P20	Geometrical methods
74G40	Regularity of solutions	74P99	None of the above, but in this section
74G45	Bounds for solutions	74Qxx	Homogenization, determination of effective properties
74G50	Saint-Venant’s principle	74Q05	Homogenization in equilibrium problems
74G55	Qualitative behavior of solutions	74Q10	Homogenization and oscillations in dynamical problems
		74Q15	Effective constitutive equations
		74Q20	Bounds on effective properties
		74Q99	None of the above, but in this section
		74Rxx	Fracture and damage
		74R05	Brittle damage
		74R10	Brittle fracture
		74R15	High-velocity fracture
		74R20	Anelastic fracture and damage
		74R99	None of the above, but in this section

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74Sxx	Numerical methods [See also 65–XX, 74G15, 74H15]	76Fxx	Turbulence [See also 37–XX, 60Gxx, 60Jxx]
74S05	Finite element methods	76F02	Fundamentals
74S10	Finite volume methods	76F05	Isotropic turbulence; homogeneous turbulence
74S15	Boundary element methods	76F06	Transition to turbulence
74S20	Finite difference methods	76F10	Shear flows
74S25	Spectral and related methods	76F20	Dynamical systems approach to turbulence [See also 37–XX]
74S30	Other numerical methods	76F25	Turbulent transport, mixing
74S60	Stochastic methods	76F30	Renormalization and other field-theoretical methods [See also 81T99]
74S70	Complex variable methods	76F35	Convective turbulence [See also 76E15, 76Rxx]
74S99	None of the above, but in this section	76F40	Turbulent boundary layers
76–XX	FLUID MECHANICS {For general continuum mechanics, see 74Axx, or other parts of 74–XX}	76F45	Stratification effects
76–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	76F50	Compressibility effects
76–01	Instructional exposition (textbooks, tutorial papers, etc.)	76F55	Statistical turbulence modeling [See also 76M35]
76–02	Research exposition (monographs, survey articles)	76F60	k - ε modeling
76–03	Historical (must also be assigned at least one classification number from Section 01)	76F65	Direct numerical and large eddy simulation of turbulence
76–04	Explicit machine computation and programs (not the theory of computation or programming)	76F70	Control of turbulent flows
76–05	Experimental work	76F99	None of the above, but in this section
76–06	Proceedings, conferences, collections, etc.	76Gxx	General aerodynamics and subsonic flows
76Axx	Foundations, constitutive equations, rheology	76G25	General aerodynamics and subsonic flows
76A02	Foundations of fluid mechanics	76G99	None of the above, but in this section
76A05	Non-Newtonian fluids	76Hxx	Transonic flows
76A10	Viscoelastic fluids	76H05	Transonic flows
76A15	Liquid crystals [See also 82D30]	76H99	None of the above, but in this section
76A20	Thin fluid films	76Jxx	Supersonic flows
76A25	Superfluids (classical aspects)	76J20	Supersonic flows
76A99	None of the above, but in this section	76J99	None of the above, but in this section
76Bxx	Incompressible inviscid fluids	76Kxx	Hypersonic flows
76B03	Existence, uniqueness, and regularity theory [See also 35Q35]	76K05	Hypersonic flows
76B07	Free-surface potential flows	76K99	None of the above, but in this section
76B10	Jets and cavities, cavitation, free-streamline theory, water-entry problems, airfoil and hydrofoil theory, sloshing	76Lxx	Shock waves and blast waves [See also 35L67]
76B15	Water waves, gravity waves; dispersion and scattering, nonlinear interaction [See also 35Q30]	76L05	Shock waves and blast waves [See also 35L67]
76B20	Ship waves	76L99	None of the above, but in this section
76B25	Solitary waves [See also 35C11]	76Mxx	Basic methods in fluid mechanics [See also 65–XX]
76B45	Capillarity (surface tension) [See also 76D45]	76M10	Finite element methods
76B47	Vortex flows	76M12	Finite volume methods
76B55	Internal waves	76M15	Boundary element methods
76B60	Atmospheric waves [See also 86A10]	76M20	Finite difference methods
76B65	Rossby waves [See also 86A05, 86A10]	76M22	Spectral methods
76B70	Stratification effects in inviscid fluids	76M23	Vortex methods
76B75	Flow control and optimization [See also 49Q10, 93C20, 93C95]	76M25	Other numerical methods
76B99	None of the above, but in this section	76M27	Visualization algorithms
76Dxx	Incompressible viscous fluids	76M28	Particle methods and lattice-gas methods
76D03	Existence, uniqueness, and regularity theory [See also 35Q30]	76M30	Variational methods
76D05	Navier-Stokes equations [See also 35Q30]	76M35	Stochastic analysis
76D06	Statistical solutions of Navier-Stokes and related equations [See also 60H30, 76M35]	76M40	Complex-variables methods
76D07	Stokes and related (Oseen, etc.) flows	76M45	Asymptotic methods, singular perturbations
76D08	Lubrication theory	76M50	Homogenization
76D09	Viscous-inviscid interaction	76M55	Dimensional analysis and similarity
76D10	Boundary-layer theory, separation and reattachment, higher-order effects	76M60	Symmetry analysis, Lie group and algebra methods
76D17	Viscous vortex flows	76M99	None of the above, but in this section
76D25	Wakes and jets	76Nxx	Compressible fluids and gas dynamics, general
76D27	Other free-boundary flows; Hele-Shaw flows	76N10	Existence, uniqueness, and regularity theory [See also 35L60, 35L65, 35Q30]
76D33	Waves	76N15	Gas dynamics, general
76D45	Capillarity (surface tension) [See also 76B45]	76N17	Viscous-inviscid interaction
76D50	Stratification effects in viscous fluids	76N20	Boundary-layer theory
76D55	Flow control and optimization [See also 49Q10, 93C20, 93C95]	76N25	Flow control and optimization
76D99	None of the above, but in this section	76N99	None of the above, but in this section
76Exx	Hydrodynamic stability	76Pxx	Rarefied gas flows, Boltzmann equation [See also 82B40, 82C40, 82D05]
76E05	Parallel shear flows	76P05	Rarefied gas flows, Boltzmann equation [See also 82B40, 82C40, 82D05]
76E06	Convection	76P99	None of the above, but in this section
76E07	Rotation	76Qxx	Hydro- and aero-acoustics
76E09	Stability and instability of nonparallel flows	76Q05	Hydro- and aero-acoustics
76E15	Absolute and convective instability and stability	76Q99	None of the above, but in this section
76E17	Interfacial stability and instability	76Rxx	Diffusion and convection
76E19	Compressibility effects	76R05	Forced convection
76E20	Stability and instability of geophysical and astrophysical flows	76R10	Free convection
76E25	Stability and instability of magnetohydrodynamic and electrohydrodynamic flows	76R50	Diffusion [See also 60J60]
76E30	Nonlinear effects	76R99	None of the above, but in this section
76E99	None of the above, but in this section	76Sxx	Flows in porous media; filtration; seepage
		76S05	Flows in porous media; filtration; seepage
		76S99	None of the above, but in this section
		76Txx	Two-phase and multiphase flows
		76T10	Liquid-gas two-phase flows, bubbly flows
		76T15	Dusty-gas two-phase flows
		76T20	Suspensions
		76T25	Granular flows [See also 74C99, 74E20]
		76T30	Three or more component flows

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76T99	None of the above, but in this section
76Uxx	Rotating fluids
76U05	Rotating fluids
76U99	None of the above, but in this section
76Vxx	Reaction effects in flows [See also 80A32]
76V05	Reaction effects in flows [See also 80A32]
76V99	None of the above, but in this section
76Wxx	Magnetohydrodynamics and electrohydrodynamics
76W05	Magnetohydrodynamics and electrohydrodynamics
76W99	None of the above, but in this section
76Xxx	Ionized gas flow in electromagnetic fields; plasmic flow [See also 82D10]
76X05	Ionized gas flow in electromagnetic fields; plasmic flow [See also 82D10]
76X99	None of the above, but in this section
76Yxx	Quantum hydrodynamics and relativistic hydrodynamics [See also 82D50 , 83C55 , 85A30]
76Y05	Quantum hydrodynamics and relativistic hydrodynamics [See also 82D50 , 83C55 , 85A30]
76Y99	None of the above, but in this section
76Zxx	Biological fluid mechanics [See also 74F10 , 74L15 , 92Cxx]
76Z05	Physiological flows [See also 92C35]
76Z10	Biopropulsion in water and in air
76Z99	None of the above, but in this section
78–XX	OPTICS, ELECTROMAGNETIC THEORY {For quantum optics, see 81V80 }
78–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
78–01	Instructional exposition (textbooks, tutorial papers, etc.)
78–02	Research exposition (monographs, survey articles)
78–03	Historical (must also be assigned at least one classification number from Section 01)
78–04	Explicit machine computation and programs (not the theory of computation or programming)
78–05	Experimental work
78–06	Proceedings, conferences, collections, etc.
78Axx	General
78A02	Foundations
78A05	Geometric optics
78A10	Physical optics
78A15	Electron optics
78A20	Space charge waves
78A25	Electromagnetic theory, general
78A30	Electro- and magnetostatics
78A35	Motion of charged particles
78A37	Ion traps
78A40	Waves and radiation
78A45	Diffraction, scattering [See also 34E20 for WKB methods]
78A46	Inverse scattering problems
78A48	Composite media; random media
78A50	Antennas, wave-guides
78A55	Technical applications
78A57	Electrochemistry
78A60	Lasers, masers, optical bistability, nonlinear optics [See also 81V80]
78A70	Biological applications [See also 91D30 , 92C30]
78A97	Mathematically heuristic optics and electromagnetic theory (must also be assigned at least one other classification number in this section)
78A99	Miscellaneous topics
78Mxx	Basic methods
78M05	Method of moments
78M10	Finite element methods
78M12	Finite volume methods, finite integration techniques
78M15	Boundary element methods
78M16	Multipole methods
78M20	Finite difference methods
78M22	Spectral methods
78M25	Other numerical methods
78M30	Variational methods
78M31	Monte Carlo methods
78M32	Neural and heuristic methods
78M34	Model reduction
78M35	Asymptotic analysis
78M40	Homogenization
78M50	Optimization
78M99	None of the above, but in this section

80–XX	CLASSICAL THERMODYNAMICS, HEAT TRANSFER {For thermodynamics of solids, see 74A15 }
80–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
80–01	Instructional exposition (textbooks, tutorial papers, etc.)
80–02	Research exposition (monographs, survey articles)
80–03	Historical (must also be assigned at least one classification number from Section 01)
80–04	Explicit machine computation and programs (not the theory of computation or programming)
80–05	Experimental work
80–06	Proceedings, conferences, collections, etc.
80Axx	Thermodynamics and heat transfer
80A05	Foundations
80A10	Classical thermodynamics, including relativistic
80A17	Thermodynamics of continua [See also 74A15]
80A20	Heat and mass transfer, heat flow
80A22	Stefan problems, phase changes, etc. [See also 74Nxx]
80A23	Inverse problems
80A25	Combustion
80A30	Chemical kinetics [See also 76V05 , 92C45 , 92E20]
80A32	Chemically reacting flows [See also 92C45 , 92E20]
80A50	Chemistry (general) [See mainly 92Exx]
80A99	None of the above, but in this section
80Mxx	Basic methods
80M10	Finite element methods
80M12	Finite volume methods
80M15	Boundary element methods
80M20	Finite difference methods
80M22	Spectral methods
80M25	Other numerical methods
80M30	Variational methods
80M31	Monte Carlo methods
80M35	Asymptotic analysis
80M40	Homogenization
80M50	Optimization
80M99	None of the above, but in this section
81–XX	QUANTUM THEORY
81–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
81–01	Instructional exposition (textbooks, tutorial papers, etc.)
81–02	Research exposition (monographs, survey articles)
81–03	Historical (must also be assigned at least one classification number from Section 01)
81–04	Explicit machine computation and programs (not the theory of computation or programming)
81–05	Experimental papers
81–06	Proceedings, conferences, collections, etc.
81–08	Computational methods
81Pxx	Axiomatics, foundations, philosophy
81P05	General and philosophical
81P10	Logical foundations of quantum mechanics; quantum logic [See also 03G12 , 06C15]
81P13	Contextuality
81P15	Quantum measurement theory
81P16	Quantum state spaces, operational and probabilistic concepts
81P20	Stochastic mechanics (including stochastic electrodynamics)
81P40	Quantum coherence, entanglement, quantum correlations
81P45	Quantum information, communication, networks [See also 94A15 , 94A17]
81P50	Quantum state estimation, approximate cloning
81P68	Quantum computation [See also 68Q05 , 68Q12]
81P70	Quantum coding (general)
81P94	Quantum cryptography [See also 94A60]
81P99	None of the above, but in this section
81Qxx	General mathematical topics and methods in quantum theory
81Q05	Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics
81Q10	Selfadjoint operator theory in quantum theory, including spectral analysis
81Q12	Non-selfadjoint operator theory in quantum theory
81Q15	Perturbation theories for operators and differential equations
81Q20	Semiclassical techniques, including WKB and Maslov methods
81Q30	Feynman integrals and graphs; applications of algebraic topology and algebraic geometry [See also 14D05 , 32S40]
81Q35	Quantum mechanics on special spaces: manifolds, fractals, graphs, etc.
81Q37	Quantum dots, waveguides, ratchets, etc.
81Q40	Bethe-Salpeter and other integral equations
81Q50	Quantum chaos [See also 37Dxx]

81Q60	Supersymmetry and quantum mechanics	81V70	Many-body theory; quantum Hall effect
81Q65	Alternative quantum mechanics	81V80	Quantum optics
81Q70	Differential-geometric methods, including holonomy, Berry and Hannay phases, etc.	81V99	None of the above, but in this section
81Q80	Special quantum systems, such as solvable systems	82–XX	STATISTICAL MECHANICS, STRUCTURE OF MATTER
81Q93	Quantum control	82–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
81Q99	None of the above, but in this section	82–01	Instructional exposition (textbooks, tutorial papers, etc.)
81Rxx	Groups and algebras in quantum theory	82–02	Research exposition (monographs, survey articles)
81R05	Finite-dimensional groups and algebras motivated by physics and their representations [See also 20C35 , 22E70]	82–03	Historical (must also be assigned at least one classification number from Section 01)
81R10	Infinite-dimensional groups and algebras motivated by physics, including Virasoro, Kac-Moody, <i>W</i> -algebras and other current algebras and their representations [See also 17B65 , 17B67 , 22E65 , 22E67 , 22E70]	82–04	Explicit machine computation and programs (not the theory of computation or programming)
81R12	Relations with integrable systems [See also 17Bxx , 37J35]	82–05	Experimental papers
81R15	Operator algebra methods [See also 46Lxx , 81T05]	82–06	Proceedings, conferences, collections, etc.
81R20	Covariant wave equations	82–08	Computational methods
81R25	Spinor and twistor methods [See also 32L25]	82Bxx	Equilibrium statistical mechanics
81R30	Coherent states [See also 22E45]; squeezed states [See also 81V80]	82B03	Foundations
81R40	Symmetry breaking	82B05	Classical equilibrium statistical mechanics (general)
81R50	Quantum groups and related algebraic methods [See also 16T20 , 17B37]	82B10	Quantum equilibrium statistical mechanics (general)
81R60	Noncommutative geometry	82B20	Lattice systems (Ising, dimer, Potts, etc.) and systems on graphs
81R99	None of the above, but in this section	82B21	Continuum models (systems of particles, etc.)
81Sxx	General quantum mechanics and problems of quantization	82B23	Exactly solvable models; Bethe ansatz
81S05	Canonical quantization, commutation relations and statistics	82B24	Interface problems; diffusion-limited aggregation
81S10	Geometry and quantization, symplectic methods [See also 53D50]	82B26	Phase transitions (general)
81S20	Stochastic quantization	82B27	Critical phenomena
81S22	Open systems, reduced dynamics, master equations, decoherence [See also 82C31]	82B28	Renormalization group methods [See also 81T17]
81S25	Quantum stochastic calculus	82B30	Statistical thermodynamics [See also 80–XX]
81S30	Phase-space methods including Wigner distributions, etc.	82B31	Stochastic methods
81S40	Path integrals [See also 58D30]	82B35	Irreversible thermodynamics, including Onsager-Machlup theory [See also 92E20]
81S99	None of the above, but in this section	82B40	Kinetic theory of gases
81Txx	Quantum field theory; related classical field theories [See also 70Sxx]	82B41	Random walks, random surfaces, lattice animals, etc. [See also 60G50 , 82C41]
81T05	Axiomatic quantum field theory; operator algebras	82B43	Percolation [See also 60K35]
81T08	Constructive quantum field theory	82B44	Disordered systems (random Ising models, random Schrödinger operators, etc.)
81T10	Model quantum field theories	82B80	Numerical methods (Monte Carlo, series resummation, etc.) [See also 65–XX , 81T80]
81T13	Yang-Mills and other gauge theories [See also 53C07 , 58E15]	82B99	None of the above, but in this section
81T15	Perturbative methods of renormalization	82Cxx	Time-dependent statistical mechanics (dynamic and nonequilibrium)
81T16	Nonperturbative methods of renormalization	82C03	Foundations
81T17	Renormalization group methods	82C05	Classical dynamic and nonequilibrium statistical mechanics (general)
81T18	Feynman diagrams	82C10	Quantum dynamics and nonequilibrium statistical mechanics (general)
81T20	Quantum field theory on curved space backgrounds	82C20	Dynamic lattice systems (kinetic Ising, etc.) and systems on graphs
81T25	Quantum field theory on lattices	82C21	Dynamic continuum models (systems of particles, etc.)
81T27	Continuum limits	82C22	Interacting particle systems [See also 60K35]
81T28	Thermal quantum field theory [See also 82B30]	82C23	Exactly solvable dynamic models [See also 37K60]
81T30	String and superstring theories; other extended objects (e.g., branes) [See also 83E30]	82C24	Interface problems; diffusion-limited aggregation
81T40	Two-dimensional field theories, conformal field theories, etc.	82C26	Dynamic and nonequilibrium phase transitions (general)
81T45	Topological field theories [See also 57R56 , 58Dxx]	82C27	Dynamic critical phenomena
81T50	Anomalies	82C28	Dynamic renormalization group methods [See also 81T17]
81T55	Casimir effect	82C31	Stochastic methods (Fokker-Planck, Langevin, etc.) [See also 60H10]
81T60	Supersymmetric field theories	82C32	Neural nets [See also 68T05 , 91E40 , 92B20]
81T70	Quantization in field theory; cohomological methods [See also 58D29]	82C35	Irreversible thermodynamics, including Onsager-Machlup theory
81T75	Noncommutative geometry methods [See also 46L85 , 46L87 , 58B34]	82C40	Kinetic theory of gases
81T80	Simulation and numerical modeling	82C41	Dynamics of random walks, random surfaces, lattice animals, etc. [See also 60G50]
81T99	None of the above, but in this section	82C43	Time-dependent percolation [See also 60K35]
81Uxx	Scattering theory [See also 34A55 , 34L25 , 34L40 , 35P25 , 47A40]	82C44	Dynamics of disordered systems (random Ising systems, etc.)
81U05	2-body potential scattering theory [See also 34E20 for WKB methods]	82C70	Transport processes
81U10	<i>n</i> -body potential scattering theory	82C80	Numerical methods (Monte Carlo, series resummation, etc.)
81U15	Exactly and quasi-solvable systems	82C99	None of the above, but in this section
81U20	<i>S</i> -matrix theory, etc.	82Dxx	Applications to specific types of physical systems
81U30	Dispersion theory, dispersion relations	82D05	Gases
81U35	Inelastic and multichannel scattering	82D10	Plasmas
81U40	Inverse scattering problems	82D15	Liquids
81U99	None of the above, but in this section	82D20	Solids
81Vxx	Applications to specific physical systems	82D25	Crystals {For crystallographic group theory, see 20H15 }
81V05	Strong interaction, including quantum chromodynamics	82D30	Random media, disordered materials (including liquid crystals and spin glasses)
81V10	Electromagnetic interaction; quantum electrodynamics	82D35	Metals
81V15	Weak interaction	82D37	Semiconductors
81V17	Gravitational interaction [See also 83Cxx and 83Exx]	82D40	Magnetic materials
81V19	Other fundamental interactions	82D45	Ferroelectrics
81V22	Unified theories	82D50	Superfluids
81V25	Other elementary particle theory	82D55	Superconductors
81V35	Nuclear physics	82D60	Polymers
81V45	Atomic physics	82D75	Nuclear reactor theory; neutron transport
81V55	Molecular physics [See also 92E10]	82D77	Quantum wave guides, quantum wires [See also 78A50]
81V65	Quantum dots [See also 82D20]		

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82D80	Nanostructures and nanoparticles	85A40	Cosmology {For relativistic cosmology, see 83F05 }
82D99	None of the above, but in this section	85A99	Miscellaneous topics
83–XX	RELATIVITY AND GRAVITATIONAL THEORY	86–XX	GEOPHYSICS [See also 76U05 , 76V05]
83–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	86–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
83–01	Instructional exposition (textbooks, tutorial papers, etc.)	86–01	Instructional exposition (textbooks, tutorial papers, etc.)
83–02	Research exposition (monographs, survey articles)	86–02	Research exposition (monographs, survey articles)
83–03	Historical (must also be assigned at least one classification number from Section 01)	86–03	Historical (must also be assigned at least one classification number from Section 01)
83–04	Explicit machine computation and programs (not the theory of computation or programming)	86–04	Explicit machine computation and programs (not the theory of computation or programming)
83–05	Experimental work	86–05	Experimental work
83–06	Proceedings, conferences, collections, etc.	86–06	Proceedings, conferences, collections, etc.
83–08	Computational methods	86–08	Computational methods
83Axx	Special relativity	86Axx	Geophysics [See also 76U05 , 76V05]
83A05	Special relativity	86A04	General
83A99	None of the above, but in this section	86A05	Hydrology, hydrography, oceanography [See also 76Bxx , 76E20 , 76Q05 , 76Rxx , 76U05]
83Bxx	Observational and experimental questions	86A10	Meteorology and atmospheric physics [See also 76Bxx , 76E20 , 76N15 , 76Q05 , 76Rxx , 76U05]
83B05	Observational and experimental questions	86A15	Seismology
83B99	None of the above, but in this section	86A17	Global dynamics, earthquake problems
83Cxx	General relativity	86A20	Potentials, prospecting
83C05	Einstein’s equations (general structure, canonical formalism, Cauchy problems)	86A22	Inverse problems [See also 35R30]
83C10	Equations of motion	86A25	Geo-electricity and geomagnetism [See also 76W05 , 78A25]
83C15	Exact solutions	86A30	Geodesy, mapping problems
83C20	Classes of solutions; algebraically special solutions, metrics with symmetries	86A32	Geostatistics
83C22	Einstein-Maxwell equations	86A40	Glaciology
83C25	Approximation procedures, weak fields	86A60	Geological problems
83C27	Lattice gravity, Regge calculus and other discrete methods	86A99	Miscellaneous topics
83C30	Asymptotic procedures (radiation, news functions, H -spaces, etc.)	90–XX	OPERATIONS RESEARCH, MATHEMATICAL PROGRAMMING
83C35	Gravitational waves	90–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
83C40	Gravitational energy and conservation laws; groups of motions	90–01	Instructional exposition (textbooks, tutorial papers, etc.)
83C45	Quantization of the gravitational field	90–02	Research exposition (monographs, survey articles)
83C47	Methods of quantum field theory [See also 81T20]	90–03	Historical (must also be assigned at least one classification number from Section 01)
83C50	Electromagnetic fields	90–04	Explicit machine computation and programs (not the theory of computation or programming)
83C55	Macroscopic interaction of the gravitational field with matter (hydrodynamics, etc.)	90–06	Proceedings, conferences, collections, etc.
83C57	Black holes	90–08	Computational methods
83C60	Spinor and twistor methods; Newman-Penrose formalism	90Bxx	Operations research and management science
83C65	Methods of noncommutative geometry [See also 58B34]	90B05	Inventory, storage, reservoirs
83C75	Space-time singularities, cosmic censorship, etc.	90B06	Transportation, logistics
83C80	Analogues in lower dimensions	90B10	Network models, deterministic
83C99	None of the above, but in this section	90B15	Network models, stochastic
83Dxx	Relativistic gravitational theories other than Einstein’s, including asymmetric field theories	90B18	Communication networks [See also 68M10 , 94A05]
83D05	Relativistic gravitational theories other than Einstein’s, including asymmetric field theories	90B20	Traffic problems
83D99	None of the above, but in this section	90B22	Queues and service [See also 60K25 , 68M20]
83Exx	Unified, higher-dimensional and super field theories	90B25	Reliability, availability, maintenance, inspection [See also 60K10 , 62N05]
83E05	Geometrodynamics	90B30	Production models
83E15	Kaluza-Klein and other higher-dimensional theories	90B35	Scheduling theory, deterministic [See also 68M20]
83E30	String and superstring theories [See also 81T30]	90B36	Scheduling theory, stochastic [See also 68M20]
83E50	Supergravity	90B40	Search theory
83E99	None of the above, but in this section	90B50	Management decision making, including multiple objectives [See also 90C29 , 90C31 , 91A35 , 91B06]
83Fxx	Cosmology	90B60	Marketing, advertising [See also 91B60]
83F05	Cosmology	90B70	Theory of organizations, manpower planning [See also 91D35]
83F99	None of the above, but in this section	90B80	Discrete location and assignment [See also 90C10]
85–XX	ASTRONOMY AND ASTROPHYSICS {For celestial mechanics, see 70F15 }	90B85	Continuous location
85–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	90B90	Case-oriented studies
85–01	Instructional exposition (textbooks, tutorial papers, etc.)	90B99	None of the above, but in this section
85–02	Research exposition (monographs, survey articles)	90Cxx	Mathematical programming [See also 49Mxx , 65Kxx]
85–03	Historical (must also be assigned at least one classification number from Section 01)	90C05	Linear programming
85–04	Explicit machine computation and programs (not the theory of computation or programming)	90C06	Large-scale problems
85–05	Experimental work	90C08	Special problems of linear programming (transportation, multi-index, etc.)
85–06	Proceedings, conferences, collections, etc.	90C09	Boolean programming
85–08	Computational methods	90C10	Integer programming
85Axx	Astronomy and astrophysics {For celestial mechanics, see 70F15 }	90C11	Mixed integer programming
85A04	General	90C15	Stochastic programming
85A05	Galactic and stellar dynamics	90C20	Quadratic programming
85A15	Galactic and stellar structure	90C22	Semidefinite programming
85A20	Planetary atmospheres	90C25	Convex programming
85A25	Radiative transfer	90C26	Nonconvex programming, global optimization
85A30	Hydrodynamic and hydromagnetic problems [See also 76Y05]	90C27	Combinatorial optimization
85A35	Statistical astronomy	90C29	Multi-objective and goal programming
		90C30	Nonlinear programming

90C31	Sensitivity, stability, parametric optimization	91B30	Risk theory, insurance
90C32	Fractional programming	91B32	Resource and cost allocation
90C33	Complementarity and equilibrium problems and variational inequalities (finite dimensions)	91B38	Production theory, theory of the firm
90C34	Semi-infinite programming	91B40	Labor market, contracts
90C35	Programming involving graphs or networks [See also 90C27]	91B42	Consumer behavior, demand theory
90C39	Dynamic programming [See also 49L20]	91B44	Informational economics
90C40	Markov and semi-Markov decision processes	91B50	General equilibrium theory
90C46	Optimality conditions, duality [See also 49N15]	91B51	Dynamic stochastic general equilibrium theory
90C47	Minimax problems [See also 49K35]	91B52	Special types of equilibria
90C48	Programming in abstract spaces	91B54	Special types of economies
90C49	Extreme-point and pivoting methods	91B55	Economic dynamics
90C51	Interior-point methods	91B60	Trade models
90C52	Methods of reduced gradient type	91B62	Growth models
90C53	Methods of quasi-Newton type	91B64	Macro-economic models (monetary models, models of taxation)
90C55	Methods of successive quadratic programming type	91B66	Multisectoral models
90C56	Derivative-free methods and methods using generalized derivatives [See also 49J52]	91B68	Matching models
90C57	Polyhedral combinatorics, branch-and-bound, branch-and-cut	91B69	Heterogeneous agent models
90C59	Approximation methods and heuristics	91B70	Stochastic models
90C60	Abstract computational complexity for mathematical programming problems [See also 68Q25]	91B72	Spatial models
90C70	Fuzzy programming	91B74	Models of real-world systems
90C90	Applications of mathematical programming	91B76	Environmental economics (natural resource models, harvesting, pollution, etc.)
90C99	None of the above, but in this section	91B80	Applications of statistical and quantum mechanics to economics (econophysics)
91–XX	GAME THEORY, ECONOMICS, SOCIAL AND BEHAVIORAL SCIENCES	91B82	Statistical methods; economic indices and measures
91–00	General reference works (handbooks, dictionaries, bibliographies, etc.)	91B84	Economic time series analysis [See also 62M10]
91–01	Instructional exposition (textbooks, tutorial papers, etc.)	91B99	None of the above, but in this section
91–02	Research exposition (monographs, survey articles)	91Cxx	Social and behavioral sciences: general topics {For statistics, see 62–XX}
91–03	Historical (must also be assigned at least one classification number from section 01)	91C05	Measurement theory
91–04	Explicit machine computation and programs (not the theory of computation or programming)	91C15	One- and multidimensional scaling
91–06	Proceedings, conferences, collections, etc.	91C20	Clustering [See also 62H30]
91–08	Computational methods	91C99	None of the above, but in this section
91Axx	Game theory	91Dxx	Mathematical sociology (including anthropology)
91A05	2-person games	91D10	Models of societies, social and urban evolution
91A06	n -person games, $n > 2$	91D20	Mathematical geography and demography
91A10	Noncooperative games	91D25	Spatial models [See also 91B72]
91A12	Cooperative games	91D30	Social networks
91A13	Games with infinitely many players	91D35	Manpower systems [See also 91B40, 90B70]
91A15	Stochastic games	91D99	None of the above, but in this section
91A18	Games in extensive form	91Exx	Mathematical psychology
91A20	Multistage and repeated games	91E10	Cognitive psychology
91A22	Evolutionary games	91E30	Psychophysics and psychophysiology; perception
91A23	Differential games [See also 49N70]	91E40	Memory and learning [See also 68T05]
91A24	Positional games (pursuit and evasion, etc.) [See also 49N75]	91E45	Measurement and performance
91A25	Dynamic games	91E99	None of the above, but in this section
91A26	Rationality, learning	91Fxx	Other social and behavioral sciences (mathematical treatment)
91A28	Signaling, communication	91F10	History, political science
91A30	Utility theory for games [See also 91B16]	91F20	Linguistics [See also 03B65, 68T50]
91A35	Decision theory for games [See also 62Cxx, 91B06, 90B50]	91F99	None of the above, but in this section
91A40	Game-theoretic models	91Gxx	Mathematical finance
91A43	Games involving graphs [See also 05C57]	91G10	Portfolio theory
91A44	Games involving topology or set theory	91G20	Derivative securities
91A46	Combinatorial games	91G30	Interest rates (stochastic models)
91A50	Discrete-time games	91G40	Credit risk
91A55	Games of timing	91G50	Corporate finance
91A60	Probabilistic games; gambling [See also 60G40]	91G60	Numerical methods (including Monte Carlo methods)
91A65	Hierarchical games	91G70	Statistical methods, econometrics
91A70	Spaces of games	91G80	Financial applications of other theories (stochastic control, calculus of variations, PDE, SPDE, dynamical systems)
91A80	Applications of game theory	91G99	None of the above, but in this section
91A90	Experimental studies	92–XX	BIOLOGY AND OTHER NATURAL SCIENCES
91A99	None of the above, but in this section	92–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
91Bxx	Mathematical economics {For econometrics, see 62P20}	92–01	Instructional exposition (textbooks, tutorial papers, etc.)
91B02	Fundamental topics (basic mathematics, methodology; applicable to economics in general)	92–02	Research exposition (monographs, survey articles)
91B06	Decision theory [See also 62Cxx, 90B50, 91A35]	92–03	Historical (must also be assigned at least one classification number from Section 01)
91B08	Individual preferences	92–04	Explicit machine computation and programs (not the theory of computation or programming)
91B10	Group preferences	92–06	Proceedings, conferences, collections, etc.
91B12	Voting theory	92–08	Computational methods
91B14	Social choice	92Bxx	Mathematical biology in general
91B15	Welfare economics	92B05	General biology and biomathematics
91B16	Utility theory	92B10	Taxonomy, cladistics, statistics
91B18	Public goods	92B15	General biostatistics [See also 62P10]
91B24	Price theory and market structure	92B20	Neural networks, artificial life and related topics [See also 68T05, 82C32, 94Cxx]
91B25	Asset pricing models	92B25	Biological rhythms and synchronization
91B26	Market models (auctions, bargaining, bidding, selling, etc.)	92B99	None of the above, but in this section

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92Cxx	Physiological, cellular and medical topics
92C05	Biophysics
92C10	Biomechanics [See also 74L15]
92C15	Developmental biology, pattern formation
92C17	Cell movement (chemotaxis, etc.)
92C20	Neural biology
92C30	Physiology (general)
92C35	Physiological flow [See also 76Z05]
92C37	Cell biology
92C40	Biochemistry, molecular biology
92C42	Systems biology, networks
92C45	Kinetics in biochemical problems (pharmacokinetics, enzyme kinetics, etc.) [See also 80A30]
92C50	Medical applications (general)
92C55	Biomedical imaging and signal processing [See also 44A12 , 65R10 , 94A08 , 94A12]
92C60	Medical epidemiology
92C80	Plant biology
92C99	None of the above, but in this section
92Dxx	Genetics and population dynamics
92D10	Genetics {For genetic algebras, see 17D92 }
92D15	Problems related to evolution
92D20	Protein sequences, DNA sequences
92D25	Population dynamics (general)
92D30	Epidemiology
92D40	Ecology
92D50	Animal behavior
92D99	None of the above, but in this section
92Exx	Chemistry {For biochemistry, see 92C40}
92E10	Molecular structure (graph-theoretic methods, methods of differential topology, etc.)
92E20	Classical flows, reactions, etc. [See also 80A30 , 80A32]
92E99	None of the above, but in this section
92Fxx	Other natural sciences (should also be assigned at least one other classification number in this section)
92F05	Other natural sciences (should also be assigned at least one other classification number in section 92)
92F99	None of the above, but in this section
93–XX	SYSTEMS THEORY; CONTROL {For optimal control, see 49–XX}
93–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
93–01	Instructional exposition (textbooks, tutorial papers, etc.)
93–02	Research exposition (monographs, survey articles)
93–03	Historical (must also be assigned at least one classification number from Section 01)
93–04	Explicit machine computation and programs (not the theory of computation or programming)
93–06	Proceedings, conferences, collections, etc.
93Axx	General
93A05	Axiomatic system theory
93A10	General systems
93A13	Hierarchical systems
93A14	Decentralized systems
93A15	Large scale systems
93A30	Mathematical modeling (models of systems, model-matching, etc.)
93A99	None of the above, but in this section
93Bxx	Controllability, observability, and system structure
93B03	Attainable sets
93B05	Controllability
93B07	Observability
93B10	Canonical structure
93B11	System structure simplification
93B12	Variable structure systems
93B15	Realizations from input-output data
93B17	Transformations
93B18	Linearizations
93B20	Minimal systems representations
93B25	Algebraic methods
93B27	Geometric methods
93B28	Operator-theoretic methods [See also 47A48 , 47A57 , 47B35 , 47N70]
93B30	System identification
93B35	Sensitivity (robustness)
93B36	H^∞ -control
93B40	Computational methods
93B50	Synthesis problems
93B51	Design techniques (robust design, computer-aided design, etc.)
93B52	Feedback control
93B55	Pole and zero placement problems
93B60	Eigenvalue problems
93B99	None of the above, but in this section

93Cxx	Control systems
93C05	Linear systems
93C10	Nonlinear systems
93C15	Systems governed by ordinary differential equations [See also 34H05]
93C20	Systems governed by partial differential equations
93C23	Systems governed by functional-differential equations [See also 34K35]
93C25	Systems in abstract spaces
93C30	Systems governed by functional relations other than differential equations (such as hybrid and switching systems)
93C35	Multivariable systems
93C40	Adaptive control
93C41	Problems with incomplete information
93C42	Fuzzy control systems
93C55	Discrete-time systems
93C57	Sampled-data systems
93C62	Digital systems
93C65	Discrete event systems
93C70	Time-scale analysis and singular perturbations
93C73	Perturbations
93C80	Frequency-response methods
93C83	Control problems involving computers (process control, etc.)
93C85	Automated systems (robots, etc.) [See also 68T40 , 70B15 , 70Q05]
93C95	Applications
93C99	None of the above, but in this section
93Dxx	Stability
93D05	Lyapunov and other classical stabilities (Lagrange, Poisson, L^p , l^p , etc.)
93D09	Robust stability
93D10	Popov-type stability of feedback systems
93D15	Stabilization of systems by feedback
93D20	Asymptotic stability
93D21	Adaptive or robust stabilization
93D25	Input-output approaches
93D30	Scalar and vector Lyapunov functions
93D99	None of the above, but in this section
93Exx	Stochastic systems and control
93E03	Stochastic systems, general
93E10	Estimation and detection [See also 60G35]
93E11	Filtering [See also 60G35]
93E12	System identification
93E14	Data smoothing
93E15	Stochastic stability
93E20	Optimal stochastic control
93E24	Least squares and related methods
93E25	Other computational methods
93E35	Stochastic learning and adaptive control
93E99	None of the above, but in this section
94–XX	INFORMATION AND COMMUNICATION, CIRCUITS
94–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
94–01	Instructional exposition (textbooks, tutorial papers, etc.)
94–02	Research exposition (monographs, survey articles)
94–03	Historical (must also be assigned at least one classification number from Section 01)
94–04	Explicit machine computation and programs (not the theory of computation or programming)
94–06	Proceedings, conferences, collections, etc.
94Axx	Communication, information
94A05	Communication theory [See also 60G35 , 90B18]
94A08	Image processing (compression, reconstruction, etc.) [See also 68U10]
94A11	Application of orthogonal and other special functions
94A12	Signal theory (characterization, reconstruction, filtering, etc.)
94A13	Detection theory
94A14	Modulation and demodulation
94A15	Information theory, general [See also 62B10 , 81P94]
94A17	Measures of information, entropy
94A20	Sampling theory
94A24	Coding theorems (Shannon theory)
94A29	Source coding [See also 68P30]
94A34	Rate-distortion theory
94A40	Channel models (including quantum)
94A45	Prefix, length-variable, comma-free codes [See also 20M35 , 68Q45]
94A50	Theory of questionnaires
94A55	Shift register sequences and sequences over finite alphabets
94A60	Cryptography [See also 11T71 , 14G50 , 68P25 , 81P94]
94A62	Authentication and secret sharing [See also 81P94]
94A99	None of the above, but in this section

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94Bxx	Theory of error-correcting codes and error-detecting codes
94B05	Linear codes, general
94B10	Convolutional codes
94B12	Combined modulation schemes (including trellis codes)
94B15	Cyclic codes
94B20	Burst-correcting codes
94B25	Combinatorial codes
94B27	Geometric methods (including applications of algebraic geometry) [See also 11T71 , 14G50]
94B30	Majority codes
94B35	Decoding
94B40	Arithmetic codes [See also 11T71 , 14G50]
94B50	Synchronization error-correcting codes
94B60	Other types of codes
94B65	Bounds on codes
94B70	Error probability
94B75	Applications of the theory of convex sets and geometry of numbers (covering radius, etc.) [See also 11H31 , 11H71]
94B99	None of the above, but in this section
94Cxx	Circuits, networks
94C05	Analytic circuit theory
94C10	Switching theory, application of Boolean algebra; Boolean functions [See also 06E30]
94C12	Fault detection; testing
94C15	Applications of graph theory [See also 05Cxx , 68R10]
94C30	Applications of design theory [See also 05Bxx]
94C99	None of the above, but in this section
94Dxx	Fuzzy sets and logic (in connection with questions of Section 94) [See also 03B52, 03E72, 28E10]
94D05	Fuzzy sets and logic (in connection with questions of Section 94) [See also 03B52 , 03E72 , 28E10]
94D99	None of the above, but in this section
97–XX	MATHEMATICS EDUCATION
97–00	General reference works (handbooks, dictionaries, bibliographies, etc.)
97–01	Instructional exposition (textbooks, tutorial papers, etc.)
97–02	Research exposition (monographs, survey articles)
97–03	Historical (must also be assigned at least one classification number from Section 01)
97–04	Explicit machine computation and programs (not the theory of computation or programming)
97–06	Proceedings, conferences, collections, etc.
97Axx	General, mathematics and education
97A10	Comprehensive works, reference books
97A20	Recreational mathematics, games [See also 00A08]
97A30	History of mathematics and mathematics education [See also 01–XX]
97A40	Mathematics and society
97A50	Bibliographies [See also 01–00]
97A70	Theses and postdoctoral theses
97A80	Popularization of mathematics
97A99	None of the above, but in this section
97Bxx	Educational policy and systems
97B10	Educational research and planning
97B20	General education
97B30	Vocational education
97B40	Higher education
97B50	Teacher education {For research aspects, see 97C70 }
97B60	Adult and further education
97B70	Syllabuses, educational standards
97B99	None of the above, but in this section
97Cxx	Psychology of mathematics education, research in mathematics education
97C10	Comprehensive works
97C20	Affective behavior
97C30	Cognitive processes, learning theories
97C40	Intelligence and aptitudes
97C50	Language and verbal communities
97C60	Sociological aspects of learning
97C70	Teaching-learning processes
97C99	None of the above, but in this section
97Dxx	Education and instruction in mathematics
97D10	Comprehensive works, comparative studies
97D20	Philosophical and theoretical contributions (maths didactics)
97D30	Objectives and goals
97D40	Teaching methods and classroom techniques
97D50	Teaching problem solving and heuristic strategies {For research aspects, see 97Cxx }
97D60	Student assessment, achievement control and rating
97D70	Learning difficulties and student errors
97D80	Teaching units and draft lessons

97D99	None of the above, but in this section
97Exx	Foundations of mathematics
97E10	Comprehensive works
97E20	Philosophy and mathematics
97E30	Logic
97E40	Language of mathematics
97E50	Reasoning and proving in the mathematics classroom
97E60	Sets, relations, set theory
97E99	None of the above, but in this section
97Fxx	Arithmetic, number theory
97F10	Comprehensive works
97F20	Pre-numerical stage, concept of numbers
97F30	Natural numbers
97F40	Integers, rational numbers
97F50	Real numbers, complex numbers
97F60	Number theory
97F70	Measures and units
97F80	Ratio and proportion, percentages
97F90	Real life mathematics, practical arithmetic
97F99	None of the above, but in this section
97Gxx	Geometry
97G10	Comprehensive works
97G20	Informal geometry
97G30	Areas and volumes
97G40	Plane and solid geometry
97G50	Transformation geometry
97G60	Plane and spherical trigonometry
97G70	Analytic geometry. Vector algebra
97G80	Descriptive geometry
97G99	None of the above, but in this section
97Hxx	Algebra
97H10	Comprehensive works
97H20	Elementary algebra
97H30	Equations and inequalities
97H40	Groups, rings, fields
97H50	Ordered algebraic structures
97H60	Linear algebra
97H99	None of the above, but in this section
97Ixx	Analysis
97I10	Comprehensive works
97I20	Mappings and functions
97I30	Sequences and series
97I40	Differential calculus
97I50	Integral calculus
97I60	Functions of several variables
97I70	Functional equations
97I80	Complex analysis
97I99	None of the above, but in this section
97Kxx	Combinatorics, graph theory, probability theory, statistics
97K10	Comprehensive works
97K20	Combinatorics
97K30	Graph theory
97K40	Descriptive statistics
97K50	Probability theory
97K60	Distributions and stochastic processes
97K70	Foundations and methodology of statistics
97K80	Applied statistics
97K99	None of the above, but in this section
97Mxx	Mathematical modeling, applications of mathematics
97M10	Modeling and interdisciplinarity
97M20	Mathematics in vocational training and career education
97M30	Financial and insurance mathematics
97M40	Operations research, economics
97M50	Physics, astronomy, technology, engineering
97M60	Biology, chemistry, medicine
97M70	Behavioral and social sciences
97M80	Arts, music, language, architecture
97M99	None of the above, but in this section
97Nxx	Numerical mathematics
97N10	Comprehensive works
97N20	Rounding, estimation, theory of errors
97N30	Numerical algebra
97N40	Numerical analysis
97N50	Interpolation and approximation
97N60	Mathematical programming
97N70	Discrete mathematics
97N80	Mathematical software, computer programs
97N99	None of the above, but in this section

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97Pxx	Computer science
97P10	Comprehensive works
97P20	Theory of computer science
97P30	System software
97P40	Programming languages
97P50	Programming techniques
97P60	Hardware
97P70	Computer science and society
97P99	None of the above, but in this section
97Qxx	Computer science education
97Q10	Comprehensive works
97Q20	Affective aspects in teaching computer science
97Q30	Cognitive processes
97Q40	Sociological aspects
97Q50	Objectives
97Q60	Teaching methods and classroom techniques
97Q70	Student assessment
97Q80	Teaching units
97Q99	None of the above, but in this section
97Rxx	Computer science applications
97R10	Comprehensive works, collections of programs
97R20	Applications in mathematics
97R30	Applications in sciences
97R40	Artificial intelligence
97R50	Data bases, information systems
97R60	Computer graphics
97R70	User programs, administrative applications
97R80	Recreational computing
97R99	None of the above, but in this section
97Uxx	Educational material and media, educational technology
97U10	Comprehensive works
97U20	Textbooks. Textbook research
97U30	Teachers' manuals and planning aids
97U40	Problem books. Competitions. Examinations
97U50	Computer assisted instruction; e-learning
97U60	Manipulative materials
97U70	Technological tools, calculators
97U80	Audiovisual media
97U99	None of the above, but in this section