

Subject Index

- Absolute 34, 35
- Absoluteness 151
 - Lemma, Shoenfield-Lévy 189
 - —, Shoenfield's 195
 - Principle, Lévy 76, 77, 243
- Absolute version of a predicate 243
- Abstract Kleene Theorem 231, 241
- Acceptable structure 229
 - —, almost 229
- Aczel, P. 230, 380
 - [1970] 230
 - Aczel-Richter [1973] 187
 - Richter-Aczel [1974] 205
- Admissible fragment 97
 - ordinal 45
 - —, nonprojectible 174
 - —, projectible 174
 - —, recursively hyperinaccessible 185
 - —, — inaccessible 176
 - —, — Mahlo 187
 - set above \mathfrak{M} 43
 - —, original definition of 11
 - — over \mathfrak{M} 43
 - —, pure 44
 - —, recursively listed 161, 164
 - —, resolvable 163, 329
 - —, s - Δ_1^1 resolvable 332
 - —, self-definable 257, 328
 - —, —, strongly 257
 - —, Σ_1 compact 257
 - —, Σ_1 complete 260
 - —, validity 260
- Admit (κ, λ) , to 277
- \mathfrak{A} -finite 153
- a.i.d. 333
- Almost all 353
- Analysis 143
 - , model of 143
- \mathfrak{A} -r.e. 153
- \mathfrak{A} -recursive 153
- Assignment 82
- Axioms A1-A7 92
- Back and forth property 292
- Barwise, J. 116, 126, 380
 - [1967] 4, 102, 291
 - [1968] 333, 352
 - [1969] 75, 102, 105, 109, 187
 - [1969a] 4
 - [1969b] 4, 333, 355
 - [1971] 365, 366
 - [1973] 102, 105, 303
 - [1974] 9, 33, 365, 366
 - Barwise-Fisher [1970] 196
 - Barwise-Gandy-Moschovakis [1971] 116, 126, 220, 321
 - Barwise-Kunen [1971] 270, 276, 291
- Beta 39
- Beth's Theorem 104, 129
- Borges, J. L. 364
- Boundedness Theorem 234
- Branch 311
- Brouwer-König Infinity Lemma 314
- Canonical Scott Sentence 297, 301
 - — Theory 300
 - structure 86
- Cardinal, α - 187
 - , inaccessible 347
 - , Mahlo 355
 - , Σ_1 compact 357
 - , strongly compact 364
 - , weakly compact 356
- Cartesian product 12
- Chang, C. C. 127, 303, 380
 - [1964] 127
 - [1968] 262, 303
 - Chang-Keisler [1973] 283, 350
 - Chang-Makkai-Reyes Theorem 127, 131
 - Chang-Moschovakis [1970] 241
- Characteristic of s in \mathfrak{M} , α - 298
- Church, A. 380
 - [1938] 2
 - Church-Kleene [1937] 2
- Church's thesis 153

- Closed in κ 352
- Closure ordinal, Moschovakis 231
 - of Σ_+ 210
 - Theorem 231
- Coding scheme 229
- Cohn, P. M. 303
- Coinductive 212
 - , Φ_1 - 204
- Collapsing 39
 - function 29, 30
 - Lemma 32, 41, 53, 54
- Collection, Δ_0 10, 11
 - , full 39
 - , Σ 17
- Combination Lemma 217
- Compactness Theorem 101
 - —, Barwise 99, 102, 144
 - —, Kreisel 2
 - —, stable 187
- Compact, Σ_1 328
- Completeness Theorem, Barwise 99, 102
 - —, extended 100
 - — for Arbitrary Skolem Fragments, weak 266
 - — for countable fragments, weak 95
 - — for $L_{\omega_1, \omega}$, karp 95
 - —, \mathfrak{M} - 89
 - —, ω - 87, 92
- Complete Σ_1 set 328
 - strict- Π_1^1 set 328
 - theory 110
- Conjunction 81
 - rule 97
- Consistency machine 134
 - property 85, 109
- Constructible 58
 - from 58
 - sets 3, 29, 57
 - — with urelements 57
- Cotype, α -recursive 236
- Countable 14
- Cover of a model 367
 - — model, admissible 367
- Craig, W. 1, 103
 - [1957] 105
- c.u.b. filter 353
- c.u.b. in κ 352
- Conjunction rule 93
- Cutland, N. 381

- Decidable structure 111
- Definability operator, general Δ 335
- Definable, invariantly 147
 - , semi-invariantly 147
- Definition, good Σ_1 61
 - , Σ_1 61
- Devlin, K. V. 381
 - [1973] 187

- Dickmann, M. A. 381
- Disjunction 81
- Divisible part of a group 117, 204
- Downward Löwenheim-Skolem-Tarski Theorem 269

- Ehrenfeucht, A. 381
 - Ehrenfeucht-Kreisel [1966] 310
 - Ehrenfeucht-Mostowski 278
- Elementary substructure, L_A - 268
- Enderston, H. 54, 381
 - [1972] 54
- End extension 34
- Engeler, E. 381
- Erdős-Rado Theorem 282, 285, 286
- Essentially uncountable 259
- Extension 34
- Extensionality 10

- Feferman, S. 381
 - [1968] 50
 - [1974] 37
 - Feferman-Kreisel [1966] 35
- Field 14
- Finite 14
 - approximations 251
 - , notions of 174
- Fisher, E. 380
 - Barwise-Fisher [1970] 196
- Fixed point 212
 - — of an inductive definition, largest 204
 - —, Φ - 203
 - —, Σ_+ 205
 - —, $\Sigma(\mathfrak{K})$ 205
- Flum, J. 381
- Forcing 4, 146
- Formula, $\forall\exists$ - 191
 - , α -finite 235
 - , atomic 79
 - , finite 79
 - , game, closed 245
 - , —, open 242
 - , —, —, of an 251
 - , —, —, recursive 242
 - , infinitary 81
 - , orderly 64
 - , Π 15
 - , proper infinitary 81
 - , R -monotone 200
 - , R -positive 156
 - , Σ 15
 - , Σ_1 15
 - , strict- Π_1^1 316
 - , strict- Σ_1^1 316
 - , termed- 64

- Formulas, Δ_0 10
 —, first order, coextended 50
 —, —, extended 50
 Foundation 10
 Fragment 84
 Friedman, H. 107, 381
 — [1973] 109, 137, 365
 Friedman-Jensen [1968] 144
 Function 14
 — symbol, Σ 21
- Gaifman, H. 381
 Gale, D. 381
 Gale-Stewart 246
 Gale-Stewart Theorem 246
 Game, infinite two-person 244
 Gandy, R. O. 72, 116, 126, 211, 381
 — [1974] 211
 — [1975] 58, 72
 Barwise-Gandy-Moschovakis [1971] 220, 321
 Gandy-Kreisel-Tait Theorem 116
 Gandy's Theorem 208, 211, 377
 — —, second half of 210
 Garland, S. J. 381
 Generalization 93
 Gödel, K. 1, 3, 8, 54, 57, 105, 382
 — [1939] 3, 62
 — [1940] 62
 Gödel numbers 154
 Gödel's operations 63
 Goofang 364
 Gordon, C. 382
 — [1970] 50, 51
 Grilliot, T. 382
 — [1972] 116
 Group, \aleph_1 -free abelian 303
 —, p - 297
 —, reduced abelian p - 297
 Grzegorzcyk, A. 382
 Grzegorzcyk, Mostowski and Ryll-Nardzewski [1959] 2
 Grzegorzcyk, Mostowski and Ryll-Nardzewski [1961] 149
- Hanf, W. 291, 382
 — [1964] 262, 364
 Hanf-Scott [1961] 364
 Hanf number 276
 — — for Σ_1 theories 291
 — — for single sentences 290, 291
 — — of second order logic 351
 Harrison, J. 112, 127, 382
 Heatherton Rock Cakes 69
 Henkin, L. 87, 382
 Henkin [1949] 269
 — [1954] 92
 — [1957] 92
- Henkin argument 86
 Hereditarily finite 46
 Holmes, O. W. 5
 Hyperarithmetic 2, 60
 — sets 149
 Hyperelementary 212
 —*, *see* extended hyperelementary 214
 —, extended 214
 — Selection Theorem 240
 — substitution 221
- i.i.d. 333
 Implicit definition of an ordinal 314
 Indescribable, Π_1^1 358
 —, strict- Π_1^1 315, 358
 Indiscernibles 279
 —, k -variable 283
 — over U 279
 — — U , k -variable 283
 Induction over ϵ , proof by 24
 — — TC, proof by 26
 Inductive 212
 —*, *see* extended inductive 214
 — definition 197, 210
 — —, absoluteness of 207
 — —, α^{th} -iterate of an 198
 — —, closure ordinal of an 200
 — —, — ordinal of Σ_+ 218
 — —, extended 214
 — —, —, closure ordinal of an 215
 — —, first order positive 211
 — —, fixed point of an 197
 — —, — point of an, smallest 197
 — — given by a formula 200
 — —, nonmonotonic 205
 — — on an essentially uncountable admissible set 262
 — —, picture of an 199
 — definitions, closure properties of 221
 — —, non-monotonic 4
 —, extended 214
 —, Φ - 203
 — relation, Σ_+ 205
 — —, $\Sigma(\uparrow\mathcal{X})$ 205
 Infinitary proof 96
 Infinity 38
 Initial substructure 34
 Inner submodel 56
 Internal set 113, 115
 Interpolation Theorem 103, 129, 253, 261
 Interpretation 54, 56
 —, transitive ϵ - 56, 57, 59
 Invariant definability 333
 — relation 301
- Jech, T. 33, 382
 — [1973] 33

- Jensen, R. B. 72, 186, 187, 381, 382
 — [1972] 58, 62, 72
 Friedman-Jensen [1968] 144
 Jensen-Karp [1972] 196
- Karp, C. 382
 — [1965] 293
 — [1967] 262
 — [1968] 9, 352
 Jensen-Karp [1972] 196
- Karp's Theorem 294
- Keisler, H. J. 84, 383
 — [1965] 250
 — [1971] 84, 86, 87, 91, 92, 103, 270, 277, 283, 291
 — [1973] 365
 Chang-Keisler [1973] 283, 350
- Kino, A. 383
 Takeuti-Kino [1962] 196
- Kleene, S. C. 1, 3, 49, 201, 380, 383
 — [1938] 2
 — [1955] 2
 Church-Kleene [1937] 2
- Kleene's Theorem 2
 — T -predicate 166
- Kleene structure, uniform 241
- König Infinity Lemma 311
 — Principle, first 321
 — —, second 322
 — —, third 323
 — Principles 311
- KP 3, 8, 11, 239
- KPU 3, 8, 239
- KPU⁺ 11
- KPU, axioms of 10, 11
 —, intuitive set theory in 11
 —, nonstandard model of 72
- Kreisel, G. 116, 255, 381, 383
 — [1959] 11
 — [1965] 11
 — [1968] 262
 — [1971] 9
 Ehrenfeucht-Kreisel [1966] 310
 Feferman-Kreisel [1966] 35
 Kreisel-Sacks [1965] 2, 168
- Kreisel Basis Theorem 315
 — Compactness Theorem 2
- Kripke, S. 3, 8, 37, 54, 126, 173, 177, 187, 383
 — [1963] 196
 — [1964] 3, 11
- Krivine, J. L. 383
 Krivine-McAloon [1973] 365
- Kueker, D. 33, 303, 383
 — [1968] 127, 303
 — [1972] 33
- Kunen, K. 380, 383
 — [1968] 262, 333, 364
 Barwise-Kunen [1971] 276, 291
 Kunen's example 121, 228, 229
- Language 79
- Lévy, A. 383
 — [1965] 10, 11, 53, 54, 72, 77, 196
- Löwenheim-Skolem Theorem, upward 276, 277
- Logic 5
 —, axioms of \mathfrak{M} - 88
 —, \mathfrak{M} - 88, 241
 —, ω - 88
- Lopez-Escobar, E. 383
 — [1965] 105
 — [1966] 109, 276
- Lyndon Interpolation Theorem 203
- Machover, M. 384
- \mathfrak{M} -admissible 45
- Mahlo cardinal 360
- Makkai, M. 127, 129, 143, 241, 384
 — [1964] 127
 — [1973] 129, 254
 — [1975] 310
- Malitz, J. 384
 — [1971] 262
- McAloon, K. 383
 Krivine-McAloon [1973] 365
- Metarecursion theory 2, 168
- Metatheory 76
- Model, see structure 138
 — Existence Theorem 84, 86, 95, 109, 269
 — — —, extended 87, 90, 93
 — — —, weak 266
- Module, Noetherian 325
- Modus Ponens 93
- Monotonic operator 197
- Montague, R. 49, 384
 — [1968] 49
- de Morgan, A. 158
- Morley, M. 384
 — [1965] 109, 291
 — [1967] 291
- Morley, V. 384
- Moschovakis, Y. N. 49, 116, 126, 173, 212, 221, 230, 242, 253, 380, 384
 — [1969a] 49
 — [1971] 242, 253
 — [1974] 173, 187, 203, 217, 221, 224, 229, 230, 232, 239, 240, 241, 242, 253
 — [1975] 205
 Barwise-Gandy-Moschovakis [1971] 220, 321
 Chang-Moschovakis [1970] 241
- Mostowski, A. 30, 381, 382, 384
 — [1949] 33, 41
 — [1961] 41
 Ehrenfeucht-Mostowski 278

- Grzegorzcyk, Mostowski and Ryll-Nardzewski [1959] 2
 Grzegorzcyk, Mostowski and Ryll-Nardzewski [1961] 149
- Nadel, M. 310, 384
 — [1971] 303, 310
 — [1974] 303, 310
- Nadel's Basis Theorem 306
- Natural number 13
- Nerode, A. 384
- Nerode's Theorem 334
- Norm 232
 —, inductive 232
- Normal Form Lemma 318
 — function 354
- Notation system 2, 168, 368
 — —, domain of a 168
 — — for IHF_{gr} 223, 227
 — —, univalent 172
- Nyberg, A. 230, 241, 334, 351
- Omitting Types Theorem 91
- Operation, Σ 23
 — symbol, substitutable 70
- Operator, general weak metarecursive 337
- Ordered n -tuples 13
 — pair 12
- Ordinal 13
 — addition 29
 —, admissible 60
 —, least nonrecursive 60
 — multiplication 29
 —, Π implicit 323, 339
 —, s - Σ_1^1 implicit 323, 341
- Orey, S. 87, 384
 — [1956] 92
- Pair 10, 11
- Pairing function 220
- Parametrization 154
 — of extended inductive relations 214
 — — first order definable relations 171
 — — inductive relations 213, 235
 — — projections 171
 — — the class of \mathcal{A} -r.e. relations 154
- Partial isomorphism 292
- Partially isomorphic structures 292
- Peano arithmetic 117, 126, 130, 137, 143, 144, 146, 158, 239
- Perfect set argument 110, 133, 137
- Persistent 34, 35
- Pinning down ordinals 105, 270
- Π_1^1 reflection 187
- Platek, R. 3, 8, 11, 54, 126, 173, 177, 187, 384
 — [1965] 3, 196
 — [1966] 11
- Power set axiom 40
- Predicate, absolute 33
 —, co-extended Σ_1^1 117
 —, Δ 21
 —, extended Π_1^1 117
 — of functions, r.e. 312
 — — integers, strict- Π_1^1 313
 —, persistent 33
- Predicates, Δ_0 14
- Prerequisites 1
- Prewellordering 164
 — Theorem 232
- Principle of parsimony 8, 13
- Projectible 168
- Projectum 174
 —, admissibility of 184
- Proof, $L_{\mathcal{A}}$ 97
- Pure part 44
 — set 44
- PZF 37
- Quantifier rank of a formula 296
- Rank function 29
 — —, \prec - 161
- Recipe 69
- Recursion along well-founded Relations 158
 —, definition by Σ 26
 —, Δ predicates defined by 28
 — Theorem, second 156, 157, 159
 — —, ordinary 49
- Recursive ordinal 2
- Recursively saturated 74
 — — structure 138
 — Σ_1^1 saturated 348
- Reducibility, Δ definable 335
 —, —, truth table 335
 —, truth table 334
 —, Turing 334
 —, weak metarecursive 337
- Reduction Theorem for \mathcal{A} -r.e. sets 165
 — — — inductive sets 240
 — — — Π_1^1 sets 167, 168
- Reflection Lemma, Π_2 185
 —, Π_1^1 358
 —, Σ 11, 16, 17
 —, s - Π_1^1 210
 —, strict- Π_1^1 322, 328
- Relation 14
 — symbol, Δ 19
- Relativization 15
- Replacement, Σ 17
 —, strong Σ 18
- Representability 149
- Representable, strongly 146, 147, 148
 —, weakly 146, 147, 148
- Resolution 163
 — of Π_1^1 sets 167, 168

- Ressayre, J.-P. 143
 Retraction, ϵ 370
 Reyes, G. E. 384
 — [1968] 127
 Richter, W. 384
 Aczel-Richter [1973] 187
 Richter-Aczel [1974] 205
 Rigid structure 302
 Rogers Jr., H. 385
 — [1967] 336
 Rule, \mathfrak{M} - 89
 —, ω - 88
 Rules R1–R3 93
 Ryll-Nardzewski, C. 382
 Grzegorzczak, Mostowski and Ryll-Nardzewski [1959] 2
 Grzegorzczak, Mostowski and Ryll-Nardzewski [1961] 149
- Sacks, G. E. 144, 151, 383
 Kreisel-Sacks [1965] 2, 168
 Sacks school 338
 Satisfaction 82
 Schlipf, J. 139, 143, 241
 Scott, D. 303, 382, 385
 — [1964] 303
 — [1965] 303
 Hanf-Scott [1961] 364
 Scott rank of a structure 300
 Scott's Theorem 301
 Search computable 49, 50
 — —, semi- 49, 50, 51
 Second order arithmetic 143
 Section 203
 Semantics 78
 — of $L_{\infty\omega}$ 82
 Separation, Δ 17
 —, Δ_0 10, 11
 —, full 38
 —, Σ_1 38, 39, 41
 — Theorem for co- \mathfrak{A} -r.e. sets 165
 — — — inductive sets 240
 — — — Π_1^1 sets 167, 168
 Shoenfield, J. R. 1, 54, 196, 385
 — [1961] 196
 — [1967] 7, 48, 54, 56, 116, 314, 315
 s.i.i.d. 333
 Simpson, S. G. 177, 339, 385
 — [1974] 177
 Skolem fragment 263
 — — with constants 263
 — function symbol 263
 — $\forall\exists$ normal form 192
 — structure 263
 — theory 263
 Smullyan, R. 385
 Special form 268
 — set of sentences 132
 Spector, C. 385
 — [1959] 201
 — [1961] 230
 Spector class 4
 Splitting 337
 Stable 3
 — ordinal 178
 — —, β - 179
 — —, the first 189
 Stavi, J. 310
 Stewart, F. M. 381
 Gale-Stewart 246
 Strategy 244
 Stretching Theorem 279
 Structure 81
 — for L^* 10
 —, \mathfrak{M} - 88
 —, resplendent 351
 Subformula 81
 Substitutable function, *see* substitutable operation symbol 70
 — operation, *see* substitutable operation symbol 70
 Subtree 311
 Superstable 353
 Supertransitive 346
 Supervalidity property 265
 Support function 24, 29
 Suzuki, Y. 385
 Suzuki-Wilmers [1973] 365
 Svenonius, L. 248, 253, 385
 — [1965] 242
 Svenonius' Theorem 248, 352
 s.v.p., *see* supervalidity property 265
 Syntax 78
 —, axioms on 79
 — of $L_{\infty\omega}$ 81
- Table 1 14
 — 2 22
 — 3 23
 — 4 29
 — 5 254
 Tague, T. 385
 — [1964] 3
 Tait, W. 116, 381
 Takeuti, G. 3, 54, 383, 385
 — [1960] 3, 187
 — [1961] 3
 Takeuti-Kino [1962] 196
 Tarski 262
 — criterion for $<_1$ 180
 Term 79
 —, basic 84
 t -formula, *see* termed-formula 64
 Theorem of L_A 94

- Torsion part of a group 117
- Transitive closure 24
- Translation Lemma 376
- Tree 343
 - , \mathbb{A} - 344
 - argument, *see* perfect set argument 110
 - , branch thru a 344
 - , complete binary 110
 - , full binary 311
 - , κ - 361
 - , path thru a 344
 - property 361
- Truncation Lemma 73, 75
- Two cardinal model of type (κ, λ) 277
 - — models 288
 - — Theorem 277
 - — —, Morley's 277
- Type, α -recursive 235

- UCLA Logic year 211
- Unbounded in κ 352
- Uniformization Theorem for \mathbb{A} -r.e. sets 165
 - — — Π_1^1 sets 167
- Uniformly equivalent 330
- Union 10, 11
 - of chain lemma 267, 268
- Urelement 7, 10, 69

- Validity property 92, 93
 - —, smallest 93
- Variables, convention on 10, 13, 16, 157
- Vaught, R. 385
 - [1973] 253
- Ville, F. 75, 385
 - [1974] 116

- Weakly compact cardinal 357
- Weak second-order logic 51
- Well founded 39
 - — part 73
- Well-ordering 41
 - , definable 105
 - of L 162
- Wilmers, G. 385
 - [1973] 365
 - Suzuki-Wilmers [1973] 365

- Zermelo 9
- ZF 7, 8, 239