

Index

- \sim , 21
 α , 3
 \mathcal{A} -covering, 124
 \mathcal{A} -element, 121
 abstract étaleness notion, 86
 adequacy, 123
 affine scheme, 44
 algebraic theory, 213
 Archimedean preordered ring, 143
 atom, 84, 87, 135
 attached at, 24
 augmentation, 61
 Axiom 1, 2, 3
 Axiom 1', 10
 Axiom 1'', 20
 Axiom 1^W, 64
 Axiom 2, 44
 Axiom 3, 84
 Axiom A, 144
 Axiom B = Axiom 1^W _{\mathbb{R}} , 144
 Axiom B.2, 191
 Axiom C, 149
 Axiom D = Axiom 3 _{\mathbb{R}} , 153
 \mathcal{B} , 165
 β , 4
 base point of tangent vector, 24
 boundary, 56, 59
 \mathcal{C} , 181
 Cahiers topos, 181
 canonical topology, 128, 138, 149
 cartesian closed category, 1
 centered, 183
 centered at, 162
 characteristic function, 147
 co-covering, 170
 coboundary, 57
 cochain, cubical, 54, 88
 cochain, simplicial, 79
 complex points, 137
 comprehending, 118
 covering, 124, 217
 creates, 71
 \mathcal{C}_C , 181
 \mathcal{C}_S , 181
 cubical cochain, 54, 88
 current, 54
 D , 2
 $D(n)$, 18
 \mathcal{D} -étale, 69
 $\tilde{D}(p, q)$, 65
 degenerate simplex, 76
 Δ , 94
 dense, 122
 density, 122
 derivation, 40
 derivative, 7
 description, 105
 differential form, 52, 53, 75, 87
 directional derivative, 36
 distributions, 48
 D_k , 10
 $D_k(n)$, 18
 D_∞ , 16
 dual numbers, xi, 4
 Dubuc topos, 205
 ϵ -stable, 140
 Eilenberg-Mac Lane complex, 87
 element (generalized), 98
 $\mathcal{E}^n(M, V)$, 54
 η , 44
 étale, 69
 étaleness notion, 86
 Euclidean module, 93
 exponential adjointness, 219
 extension, 103

- extensionality principle, 104, 106, 110
- family, 118
- Fermat's Axiom, 9
- FGT_k , 132
- fibre, 118
- finitely presented algebra, 43
- first integral, 36
- flat, 183
- forcing, 100
- form, 52, 53
- formal manifold, 70
- formal-étale, 70
- formally real ring, 142, 163
- FPT_k , 132
- γ , 4
- generalized element, 98, 99
- generators, 121
- geometric formula, 127
- geometric line, 2
- geometric sentence, 127
- geometric theory, 127
- germ, 158, 160, 164
- germ determined, 164
- germ-algebra, 164
- germ-monad, 198
- germ-radical, 164
- global element, 117
- Grothendieck topology, 124
- groupoid, 94
- H , 198
- \mathbb{H} , 183
- Hadamard's Lemma, 50, 145, 156
- Hall's identity, 42
- Hom , 111, 132
- hom , 44
- \bar{I} , 182
- \hat{I} , 164
- imaginary points, 137
- incidence, 92
- inclusion, 104
- indexed, 118
- infinitesimal linearity, 20
- infinitesimal object, 62
- infinitesimal transformation, 29
- infinitesimally linear, 20
- integral, 36
- Integration Axiom, 49
- interval, 49
- jet, 24
- k -jet, 18
- k -neighbour, 21, 71
- Kock-Lawvere axiom, 209
- λ -conversion, 108, 219
- Lie bracket, 34
- Lie module, 41
- line, 2
- line type, 209
- Liouville vector field, 22, 32
- local character, 164
- local formula, 125
- local ring (object), 128
- manifold, 143
- Maurer–Cartan form, 81
- Mf , 143
- Mf' , 186
- micro-linear, 220
- microlinear, 93
- Milnor's Exercise, 160
- $\mathcal{M}_k(x)$, 22
- model object, 70
- monad, 22
- n -tangent, 53
- neighbour, 21, 71
- normalized cochain, 80
- ν , 44
- Nullstellensatz, 192
- open coverings, 149
- open inclusion, 86, 170
- ordinary diff. equation, 28
- parallel transport, 28
- parametrized element, 99
- partial derivative, 12, 13
- π (augmentation), 61
- plane, 2
- plot smooth, 187
- point, 161
- point determined, 161
- Positiv-stellen-satz, 201
- preorder, 49
- pretopology, 124, 217
- principal part, 26
- proper monic, 215
- proper vector field, 35
- proper-left-exact, 216
- property W, W-n, 14, 15, 32
- Pythagorean local ring, 142
- R , 2
- \mathbb{R} , 143
- $R[\epsilon]$, 4
- rectangle, 55
- reflects, 71
- reflexive object, 45

Index

233

- repr. from the outside, 181
- ring of line type, 209
- satisfaction, 99
- scheme, 44
- separably (real-) closed, 142
- sheaf, 218
- Σ^{-1} , 158
- simplex, 76
- simplicial object, 75
- slope, 2
- smooth char. function, 147
- smooth topos, 180, 181
- space, x
- spec, 43
- stable formula, 102
- stable object, 132
- stable properties and notions, 117
- stably cartesian closed, 116, 219
- stage of definition, x, 98
- Stokes' Theorem, 59
- strong infinitesimal linearity, 93, 220
- strongly étale, 86
- subcanonical, 218
- submersion, 144
- symmetric functions property, 14
- tangent bundle, 24
- tangent space, 24
- tangent vector, 24
- Taylor's formula, 7, 10, 16
- Taylor's series, 16
- \otimes_{∞} , 158
- \mathbb{T}_{∞} , 150, 154
- \mathbb{T}_k , 213
- $\mathbb{T}_k\text{-Alg}$, 132
- TM , 24
- topological density, 124
- topology (Grothendieck), 124
- topos, 218
- transversal, 143, 144
- transversal pullback, 143
- \vdash , 99, 121
- $T_x M$, 24
- universally quantified, 3
- Vect, 41
- vector field, 28, 29
- vector form of Axiom 1, 17
- W-determined, 182
- W-radical, 182
- Weil algebra, 61
- Weil prolongation, 149
- Whitney topology = Fréchet topology, 182
- X-neighbours, 35
- Yoneda map constructing principle, 105