

## CONVENTIONS

0002

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### 1. Comments

0003 The philosophy behind the conventions used in writing these documents is to choose those conventions that work.

### 2. Set theory

0004 We use Zermelo-Fraenkel set theory with the axiom of choice. See [Kun83]. We do not use universes (different from SGA4). We do not stress set-theoretic issues, but we make sure everything is correct (of course) and so we do not ignore them either.

### 3. Categories

0005 A category  $\mathcal{C}$  consists of a set of objects and, for each pair of objects, a set of morphisms between them. In other words, it is what is called a “small” category in other texts. We will use “big” categories (categories whose objects form a proper class) as well, but only those that are listed in Categories, Remark 2.2.

### 4. Algebra

0006 In these notes a ring is a commutative ring with a 1. Hence the category of rings has an initial object  $\mathbf{Z}$  and a final object  $\{0\}$  (this is the unique ring where  $1 = 0$ ). Modules are assumed unitary. See [Eis95].

### 5. Notation

055X The natural integers are elements of  $\mathbf{N} = \{1, 2, 3, \dots\}$ . The integers are elements of  $\mathbf{Z} = \{\dots, -2, -1, 0, 1, 2, \dots\}$ . The field of rational numbers is denoted  $\mathbf{Q}$ . The field of real numbers is denoted  $\mathbf{R}$ . The field of complex numbers is denoted  $\mathbf{C}$ .

## 6. Other chapters

- Preliminaries
- (1) Introduction
  - (2) Conventions
  - (3) Set Theory
  - (4) Categories
  - (5) Topology
  - (6) Sheaves on Spaces
  - (7) Sites and Sheaves
  - (8) Stacks
  - (9) Fields
  - (10) Commutative Algebra
  - (11) Brauer Groups
  - (12) Homological Algebra
  - (13) Derived Categories
  - (14) Simplicial Methods
  - (15) More on Algebra
  - (16) Smoothing Ring Maps
  - (17) Sheaves of Modules
  - (18) Modules on Sites
  - (19) Injectives
  - (20) Cohomology of Sheaves
  - (21) Cohomology on Sites
  - (22) Differential Graded Algebra
  - (23) Divided Power Algebra
  - (24) Hypercoverings
- Schemes
- (25) Schemes
  - (26) Constructions of Schemes
  - (27) Properties of Schemes
  - (28) Morphisms of Schemes
  - (29) Cohomology of Schemes
  - (30) Divisors
  - (31) Limits of Schemes
  - (32) Varieties
  - (33) Topologies on Schemes
  - (34) Descent
  - (35) Derived Categories of Schemes
  - (36) More on Morphisms
  - (37) More on Flatness
  - (38) Groupoid Schemes
  - (39) More on Groupoid Schemes
  - (40) Étale Morphisms of Schemes
- Topics in Scheme Theory
- (41) Chow Homology
  - (42) Intersection Theory
- (43) Picard Schemes of Curves
  - (44) Adequate Modules
  - (45) Dualizing Complexes
  - (46) Duality for Schemes
  - (47) Discriminants and Differents
  - (48) Local Cohomology
  - (49) Algebraic and Formal Geometry
  - (50) Algebraic Curves
  - (51) Resolution of Surfaces
  - (52) Semistable Reduction
  - (53) Fundamental Groups of Schemes
  - (54) Étale Cohomology
  - (55) Crystalline Cohomology
  - (56) Pro-étale Cohomology
- Algebraic Spaces
- (57) Algebraic Spaces
  - (58) Properties of Algebraic Spaces
  - (59) Morphisms of Algebraic Spaces
  - (60) Decent Algebraic Spaces
  - (61) Cohomology of Algebraic Spaces
  - (62) Limits of Algebraic Spaces
  - (63) Divisors on Algebraic Spaces
  - (64) Algebraic Spaces over Fields
  - (65) Topologies on Algebraic Spaces
  - (66) Descent and Algebraic Spaces
  - (67) Derived Categories of Spaces
  - (68) More on Morphisms of Spaces
  - (69) Flatness on Algebraic Spaces
  - (70) Groupoids in Algebraic Spaces
  - (71) More on Groupoids in Spaces
  - (72) Bootstrap
  - (73) Pushouts of Algebraic Spaces
- Topics in Geometry
- (74) Chow Groups of Spaces
  - (75) Quotients of Groupoids
  - (76) More on Cohomology of Spaces
  - (77) Simplicial Spaces
  - (78) Duality for Spaces
  - (79) Formal Algebraic Spaces
  - (80) Restricted Power Series
  - (81) Resolution of Surfaces Revisited
- Deformation Theory
- (82) Formal Deformation Theory
  - (83) Deformation Theory
  - (84) The Cotangent Complex

(85) Deformation Problems	(99) The Geometry of Stacks
Algebraic Stacks	Topics in Moduli Theory
(86) Algebraic Stacks	(100) Moduli Stacks
(87) Examples of Stacks	(101) Moduli of Curves
(88) Sheaves on Algebraic Stacks	Miscellany
(89) Criteria for Representability	(102) Examples
(90) Artin's Axioms	(103) Exercises
(91) Quot and Hilbert Spaces	(104) Guide to Literature
(92) Properties of Algebraic Stacks	(105) Desirables
(93) Morphisms of Algebraic Stacks	(106) Coding Style
(94) Limits of Algebraic Stacks	(107) Obsolete
(95) Cohomology of Algebraic Stacks	(108) GNU Free Documentation License
(96) Derived Categories of Stacks	(109) Auto Generated Index
(97) Introducing Algebraic Stacks	
(98) More on Morphisms of Stacks	

### References

- [Eis95] David Eisenbud, *Commutative algebra*, Graduate Texts in Mathematics, vol. 150, Springer-Verlag, 1995.
- [Kun83] Kenneth Kunen, *Set theory*, Elsevier Science, 1983.