

# CONVENTIONS

## Contents

1. Comments	1
2. Set theory	1
3. Categories	1
4. Algebra	1
5. Notation	1
6. Other chapters	1
References	3

### 1. Comments

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

### 2. Set theory

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

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

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

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) Adequate Modules
  - (43) Dualizing Complexes
  - (44) Étale Cohomology
  - (45) Crystalline Cohomology
  - (46) Pro-étale Cohomology
- Algebraic Spaces
- (47) Algebraic Spaces
  - (48) Properties of Algebraic Spaces
  - (49) Morphisms of Algebraic Spaces
  - (50) Decent Algebraic Spaces
  - (51) Cohomology of Algebraic Spaces
  - (52) Limits of Algebraic Spaces
  - (53) Divisors on Algebraic Spaces
  - (54) Algebraic Spaces over Fields
  - (55) Topologies on Algebraic Spaces
  - (56) Descent and Algebraic Spaces
  - (57) Derived Categories of Spaces
  - (58) More on Morphisms of Spaces
  - (59) Pushouts of Algebraic Spaces
  - (60) Groupoids in Algebraic Spaces
  - (61) More on Groupoids in Spaces
  - (62) Bootstrap
- Topics in Geometry
- (63) Quotients of Groupoids
  - (64) Simplicial Spaces
  - (65) Formal Algebraic Spaces
  - (66) Restricted Power Series
  - (67) Resolution of Surfaces
- Deformation Theory
- (68) Formal Deformation Theory
  - (69) Deformation Theory
  - (70) The Cotangent Complex
- Algebraic Stacks
- (71) Algebraic Stacks
  - (72) Examples of Stacks
  - (73) Sheaves on Algebraic Stacks
  - (74) Criteria for Representability
  - (75) Artin's Axioms
  - (76) Quot and Hilbert Spaces
  - (77) Properties of Algebraic Stacks
  - (78) Morphisms of Algebraic Stacks
  - (79) Cohomology of Algebraic Stacks
  - (80) Derived Categories of Stacks
  - (81) Introducing Algebraic Stacks
- Miscellany
- (82) Examples
  - (83) Exercises
  - (84) Guide to Literature
  - (85) Desirables
  - (86) Coding Style
  - (87) Obsolete
  - (88) GNU Free Documentation License
  - (89) Auto Generated Index

**References**

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