

Table of Contents

Introduction	xi
<i>Chapter 0</i>	
Historical Background	1
Exercises	5
Notes	9

Part I. Classical Compositions and Quadratic Forms

<i>Chapter 1</i>	
Spaces of Similarities	13
Appendix. Composition algebras	21
Exercises	25
Notes	36
<i>Chapter 2</i>	
Amicable Similarities	39
Exercises	46
Notes	51
<i>Chapter 3</i>	
Clifford Algebras	52
Exercises	64
Notes	71
<i>Chapter 4</i>	
C-Modules and the Decomposition Theorem	73
Appendix. λ -Hermitian forms over C	81
Exercises	83
Notes	89
<i>Chapter 5</i>	
Small (s, t)-Families	90
Exercises	101
Notes	106

Chapter 6

Involutions	108
Exercises	116
Notes	118

Chapter 7

Unsplittable (σ, τ)-Modules	119
Exercises	131
Notes	134

Chapter 8

The Space of All Compositions	135
Exercises	150
Notes	157

Chapter 9

The Pfister Factor Conjecture	160
Appendix. Pfister forms and function fields	167
Exercises	170
Notes	175

Chapter 10

Central Simple Algebras and an Expansion Theorem	176
Exercises	196
Notes	202

Chapter 11

Hasse Principles	204
Appendix. Hasse principle for divisibility of forms	218
Exercises	220
Notes	223

Part II. Compositions of Size $[r, s, n]$

Introduction	227
------------------------	-----

Chapter 12

$[r, s, n]$-Formulas and Topology	231
Appendix. More applications of topology to algebra	252
Exercises	256
Notes	264

Chapter 13

Integer Composition Formulas	268
Appendix A. A new proof of Yuzvinsky's theorem	286
Appendix B. Monomial compositions	288
Appendix C. Known upper bounds for $r * s$	291
Exercises	294
Notes	297

Chapter 14

Compositions over General Fields	299
Appendix. Compositions of quadratic forms α, β, γ	317
Exercises	321
Notes	327

Chapter 15

Hopf Constructions and Hidden Formulas	329
Appendix. Polynomial maps between spheres	348
Exercises	353
Notes	361

Chapter 16

Related Topics	363
A. Higher degree forms permitting composition	363
B. Vector products and composition algebras	368
C. Compositions over rings and over fields of characteristic 2	370
D. Linear spaces of matrices of constant rank	372
Exercises	375
Notes	380
References	381
List of Symbols	407
Index	413