

Contents

Introduction

I,1	<u>Categories</u>	1
	Yoneda	11
	Adjointness	12
	Fibrations	12
	Adjoint Functor Theorem	13
	Kan extensions	14
I,2	<u>2-Categories</u>	16
	2-functors	20
	Cat-natural transformations	22
	Quasi-natural transformations	25
	Modifications	28
	2-comma category	29
	3-category	31
	3-comma category	32
	double category	33
	2-and 3-categorical fibrations	35
I,3	<u>Bicategories</u>	38
	Pseudo-functors	40
	Quasi-natural transformations	43
	Examples	45
	Bim	45
	Spans χ	46
	Bim (B)	46
	Bim (Spans χ)	48
	Fibrations	50

I,4	<u>Properties of Fun(A,B) and Pseud (A,B)</u>	55
	Quasi-functor of two variables	56
	Characterization of Fun(A,B)	59
	Composition quasi-functor	67
	Quasi-functor of n-variables	69
	Tensor product	73
	Quasi _d -natural transformations	80
	Quasi _x -functor	81
	Monoidal closed category structure	83
	Pseud (A,B)	86
	Appendix <u>A</u> . Universal copseudo-functor	92
	Appendix <u>B</u> . Iso-Fun	95
	Appendix <u>C</u> . Categories enriched in 2-Cat _⊗	96
I,5	<u>Properties of 2-comma categories</u>	101
	Universal property	103
	Composition	106
	Explicit formulas	111
	Functors over $V_1 \times V_2$	115
	Fibration and monoid properties	120
	Homomorphism properties	124
	Examples	134
I,6	<u>Adjoint morphisms in 2-categories</u>	136
	Examples	137
	Uniqueness, composition and preservation	139
	Adjoint Squares	144
	Examples	152
	Kan extensions	154
	Examples	156
	Formal criterion for adjoint	158
	Cocompleteness	160
	Interchange of limits	161
	Final	163

I,7	<u>Quasi-adjointness</u>	166
	Definitions	168
	Uniqueness, composition and preservation	169
	Transcendental quasi-adjunction	177
	Universal mapping properties	180
	Examples	187
	Some general principles	187
	Some Finite quasi-limits	197
	Quasi-colimits in Cat	201
	Quasi-limits in Cat	217
	Quasi-fibrations	224
	Quasi-Kan extensions	237
	The Categorical Comprehension Scheme	244
	The Quasi-Yoneda Lemma	251
	Globalized Adjunction Morphisms	265
	Table of Symbols	272
	Index	275
	References	279
	Bibliography	280