

Contents

Foreword	xix
Preface to the fifth edition	xxiii
Introduction	xxv
Is this book for you?	xxv
What's in the book?	xxvii
Conventions	xxix
I Mission Impossible	1
1 Short course	3
1.1 Getting started	5
1.1.1 Your L ^A T _E X	5
1.1.2 Sample files	5
1.1.3 Editing cycle	5
1.1.4 Typing the source file	6
1.2 The keyboard	7
1.3 Your first text notes	8
1.4 Lines too wide	11
1.5 A note with formulas	12
1.6 The building blocks of a formula	14
1.7 Displayed formulas	18
1.7.1 Equations	18
1.7.2 Symbolic referencing	19
1.7.3 Aligned formulas	20
1.7.4 Cases	22
1.8 The anatomy of a document	23
1.9 Your own commands	25

1.10 Adding an illustration	25
1.11 The anatomy of a presentation	26
2 And a few more things...	31
2.1 Structure	31
2.2 Auxiliary files	32
2.3 Logical and visual design	35
2.4 General error messages	35
2.5 Errors in math	38
2.6 Your errors: Davey's Dos and Don'ts	39
II Text and Math	43
3 Typing text	45
3.1 The keyboard	46
3.1.1 Basic keys	46
3.1.2 Special keys	47
3.1.3 Prohibited keys	47
3.2 Words, sentences, and paragraphs	48
3.2.1 Spacing rules	48
3.2.2 Periods	49
3.3 Commanding L ^A T _E X	51
3.3.1 Commands and environments	51
3.3.2 Scope	55
3.3.3 Types of commands	57
3.4 Symbols not on the keyboard	58
3.4.1 Quotation marks	58
3.4.2 Dashes	58
3.4.3 Ties or nonbreakable spaces	59
3.4.4 Special characters	60
3.4.5 Ellipses	62
3.4.6 Ligatures	62
3.4.7 Accents and symbols in text	62
3.4.8 Logos and dates	62
3.4.9 Hyphenation	65
3.5 Comments and footnotes	67
3.5.1 Comments	68
3.5.2 Footnotes	70
3.6 Changing font characteristics	71
3.6.1 Basic font characteristics	71
3.6.2 Document font families	72
3.6.3 Shape commands	73
3.6.4 Italic corrections	74
3.6.5 Series	76
3.6.6 Size changes	76

3.6.7	Orthogonality	77
3.6.8	Obsolete two-letter commands	77
3.6.9	Low-level commands	78
3.7	Lines, paragraphs, and pages	78
3.7.1	Lines	78
3.7.2	Paragraphs	82
3.7.3	Pages	83
3.7.4	Multicolumn printing	84
3.8	Spaces	84
3.8.1	Horizontal spaces	84
3.8.2	Vertical spaces	86
3.8.3	Relative spaces	87
3.8.4	Expanding spaces	88
3.9	Boxes	89
3.9.1	Line boxes	89
3.9.2	Frame boxes	91
3.9.3	Paragraph boxes	92
3.9.4	Marginal comments	94
3.9.5	Solid boxes	95
3.9.6	Fine tuning boxes	96
4	Text environments	97
4.1	Some general rules for displayed text environments	98
4.2	List environments	98
4.2.1	Numbered lists	98
4.2.2	Bulleted lists	99
4.2.3	Captioned lists	100
4.2.4	A rule and combinations	100
4.3	Style and size environments	103
4.4	Proclamations (theorem-like structures)	104
4.4.1	The full syntax	108
4.4.2	Proclamations with style	109
4.5	Proof environments	111
4.6	Tabular environments	113
4.6.1	Table styles	120
4.7	Tabbing environments	121
4.8	Miscellaneous displayed text environments	123
5	Typing math	131
5.1	Math environments	132
5.2	Spacing rules	134
5.3	Equations	135
5.4	Basic constructs	137
5.4.1	Arithmetic operations	137
5.4.2	Binomial coefficients	139
5.4.3	Ellipses	139

5.4.4	Integrals	141
5.4.5	Roots	141
5.4.6	Text in math	142
5.4.7	Hebrew and Greek letters	144
5.5	Delimiters	145
5.5.1	Stretching delimiters	146
5.5.2	Delimiters that do not stretch	147
5.5.3	Limitations of stretching	147
5.5.4	Delimiters as binary relations	148
5.6	Operators	149
5.6.1	Operator tables	149
5.6.2	Congruences	151
5.6.3	Large operators	151
5.6.4	Multiline subscripts and superscripts	153
5.7	Math accents	154
5.8	Stretchable horizontal lines	155
5.8.1	Horizontal braces	155
5.8.2	Overlines and underlines	156
5.8.3	Stretchable arrow math symbols	157
5.9	Building a formula step-by-step	157
5.10	Formula Gallery	160
6	More math	167
6.1	Spacing of symbols	168
6.1.1	Classification	168
6.1.2	Three exceptions	168
6.1.3	Spacing commands	170
6.1.4	Examples	170
6.1.5	The phantom command	171
6.2	The STIX math symbols	172
6.2.1	Swinging it	172
6.2.2	The STIX project	173
6.2.3	Installation and usage	173
6.3	Building new symbols	174
6.3.1	Stacking symbols	174
6.3.2	Negating and side-setting symbols	177
6.3.3	Changing the type of a symbol	178
6.4	Math alphabets and symbols	178
6.4.1	Math alphabets	179
6.4.2	Math symbol alphabets	180
6.4.3	Bold math symbols	181
6.4.4	Size changes	182
6.4.5	Continued fractions	183
6.5	Vertical spacing	183
6.6	Tagging and grouping	185

6.7	Miscellaneous	187
6.7.1	Generalized fractions	187
6.7.2	Boxed formulas	189
7	Multiline math displays	191
7.1	Visual Guide	191
7.1.1	Columns	191
7.1.2	Subsidiary math environments	193
7.1.3	Adjusted columns	193
7.1.4	Aligned columns	194
7.1.5	Touring the Visual Guide	194
7.2	Gathering formulas	195
7.3	Splitting long formulas	196
7.4	Some general rules	198
7.4.1	General rules	198
7.4.2	Subformula rules	199
7.4.3	Breaking and aligning formulas	200
7.4.4	Numbering groups of formulas	201
7.5	Aligned columns	202
7.5.1	An <code>align</code> variant	205
7.5.2	<code>eqnarray</code> , the ancestor of <code>align</code>	205
7.5.3	The subformula rule revisited	206
7.5.4	The <code>alignat</code> environment	207
7.5.5	Inserting text	208
7.6	Aligned subsidiary math environments	210
7.6.1	Subsidiary variants	210
7.6.2	Split	212
7.7	Adjusted columns	214
7.7.1	Matrices	215
7.7.2	Arrays	218
7.7.3	Cases	221
7.8	Commutative diagrams	222
7.9	Adjusting the display	224
III	Document Structure	227
8	Documents	229
8.1	The structure of a document	230
8.2	The preamble	231
8.3	Top matter	233
8.3.1	Abstract	233
8.4	Main matter	234
8.4.1	Sectioning	234
8.4.2	Cross-referencing	237
8.4.3	Floating tables and illustrations	242

8.5	Back matter	245
8.5.1	Bibliographies in articles	245
8.5.2	Simple indexes	251
8.6	Visual design	252
9	The AMS article document class	255
9.1	Why <i>amsart</i> ?	255
9.1.1	Submitting an article to the AMS	255
9.1.2	Submitting an article to <i>Algebra Universalis</i>	256
9.1.3	Submitting to other journals	256
9.1.4	Submitting to conference proceedings	257
9.2	The top matter	257
9.2.1	Article information	257
9.2.2	Author information	259
9.2.3	AMS information	263
9.2.4	Multiple authors	264
9.2.5	Examples	265
9.2.6	Abstract	268
9.3	The sample article	268
9.4	Article templates	275
9.5	Options	279
9.6	The AMS packages	282
10	Legacy documents	285
10.1	Articles and reports	285
10.1.1	Top matter	286
10.1.2	Options	288
10.2	Letters	290
10.3	The <i>LAT_EX</i> distribution	292
10.3.1	Tools	294
IV	PDF Documents	297
11	The PDF file format	299
11.1	PostScript and PDF	299
11.1.1	PostScript	299
11.1.2	PDF	300
11.1.3	Hyperlinks	301
11.2	Hyperlinks for <i>LAT_EX</i>	301
11.2.1	Using <i>hyperref</i>	301
11.2.2	<i>backref</i> and <i>colorlinks</i>	302
11.2.3	Bookmarks	303
11.2.4	Additional commands	304

12 Presentations	307
12.1 Quick and dirty beamer	308
12.1.1 First changes	308
12.1.2 Changes in the body	309
12.1.3 Making things prettier	309
12.1.4 Adjusting the navigation	310
12.2 Baby beamers	313
12.2.1 Overlays	315
12.2.2 Understanding overlays	317
12.2.3 More on the \only and \onslide commands	319
12.2.4 Lists as overlays	321
12.2.5 Out of sequence overlays	323
12.2.6 Blocks and overlays	324
12.2.7 Links	325
12.2.8 Columns	329
12.2.9 Coloring	330
12.3 The structure of a presentation	332
12.3.1 Longer presentations	336
12.3.2 Navigation symbols	336
12.4 Notes	336
12.5 Themes	338
12.6 Planning your presentation	340
12.7 What did I leave out?	341
13 Illustrations	343
13.1 Your first picture	344
13.2 The building blocks of an illustration	347
13.3 Transformations	351
13.4 Path attributes	353
13.5 Coding the example	356
13.6 What did I leave out?	357
V Customization	359
14 Commands and environments	361
14.1 Custom commands	362
14.1.1 Examples and rules	362
14.1.2 Arguments	368
14.1.3 Short arguments	371
14.1.4 Optional arguments	372
14.1.5 Redefining commands	373
14.1.6 Defining operators	374
14.1.7 Redefining names	375
14.1.8 Showing the definitions of commands	375
14.1.9 Delimited commands	377

14.2 Custom environments	379
14.2.1 Modifying existing environments	380
14.2.2 Arguments	383
14.2.3 Optional arguments with default values	383
14.2.4 Short contents	384
14.2.5 Brand-new environments	384
14.3 A custom command file	385
14.4 The sample article with custom commands	394
14.5 Numbering and measuring	400
14.5.1 Counters	400
14.5.2 Length commands	405
14.6 Custom lists	408
14.6.1 Length commands for the <code>list</code> environment	408
14.6.2 The <code>list</code> environment	410
14.6.3 Two complete examples	413
14.6.4 The <code>trivlist</code> environment	416
14.7 The dangers of customization	416
VI Long Documents	419
15 BIB_{TEX}	421
15.1 The database	423
15.1.1 Entry types	423
15.1.2 Typing fields	425
15.1.3 Articles	428
15.1.4 Books	429
15.1.5 Conference proceedings and collections	430
15.1.6 Theses	433
15.1.7 Technical reports	434
15.1.8 Manuscripts and other entry types	434
15.1.9 Abbreviations	435
15.2 Using BIB _{TEX}	436
15.2.1 Sample files	436
15.2.2 Setup	438
15.2.3 Four steps of BIB _{TEX} ing	439
15.2.4 BIB _{TEX} files	439
15.2.5 BIB _{TEX} rules and messages	442
15.2.6 Submitting an article	445
15.3 Concluding comments	445
16 MakeIndex	447
16.1 Preparing the document	447
16.2 Index commands	451
16.3 Processing the index entries	456
16.4 Rules	459

16.5 Multiple indexes	460
16.6 Glossary	461
16.7 Concluding comments	461
17 Books in L^AT_EX	463
17.1 Book document classes	464
17.1.1 Sectioning	464
17.1.2 Division of the body	465
17.1.3 Document class options	466
17.1.4 Title pages	466
17.2 Tables of contents, lists of tables and figures	467
17.2.1 Tables of contents	467
17.2.2 Lists of tables and figures	470
17.2.3 Exercises	470
17.3 Organizing the files for a book	471
17.3.1 The folders and the master document	471
17.3.2 Inclusion and selective inclusion	472
17.3.3 Organizing your files	473
17.4 Logical design	473
17.5 Final preparations for the publisher	476
17.6 If you create the PDF file for your book	478
A Math symbol tables	481
A.1 Hebrew and Greek letters	481
A.2 Binary relations	483
A.3 Binary operations	486
A.4 Arrows	487
A.5 Miscellaneous symbols	488
A.6 Delimiters	489
A.7 Operators	490
A.7.1 Large operators	491
A.8 Math accents and fonts	492
A.9 Math spacing commands	493
B Text symbol tables	495
B.1 Some European characters	495
B.2 Text accents	496
B.3 Text font commands	496
B.3.1 Text font family commands	496
B.3.2 Text font size changes	497
B.4 Additional text symbols	498
B.5 Additional text symbols with T1 encoding	499
B.6 Text spacing commands	500

C Some background	501
C.1 A short history	501
C.1.1 \TeX	501
C.1.2 \LaTeX 2.09 and AMS- \TeX	502
C.1.3 \LaTeX 3	503
C.1.4 More recent developments	504
C.2 How \LaTeX works	505
C.2.1 The layers	505
C.2.2 Typesetting	506
C.2.3 Viewing and printing	507
C.2.4 \LaTeX 's files	508
C.3 Interactive \LaTeX	511
C.4 Separating form and content	512
D \LaTeX and the Internet	515
D.1 Obtaining files from the Internet	515
D.2 The \TeX Users Group	518
D.3 Some useful sources of \LaTeX information	519
E PostScript fonts	521
E.1 The Times font and MathTime	522
E.2 Lucida Bright fonts	524
E.3 More PostScript fonts	524
F \LaTeX localized	525
G \LaTeX on the iPad	529
G.1 The iPad as a computer	530
G.1.1 File system	530
G.1.2 FileApp	531
G.1.3 Printing	533
G.1.4 Text editors	533
G.2 Files	534
G.3 Two \LaTeX implementations for the iPad	534
G.3.1 Texpad	534
G.3.2 TeX Writer	540
G.4 Conclusion	541
H Final thoughts	543
H.1 What was left out?	543
H.1.1 \LaTeX omissions	543
H.1.2 \TeX omissions	544
H.2 Further reading	545
Bibliography	547
Index	551