

Contents

1	Examples of introduction	1
1.1	Compilation with L ^A T _E X	1
1.2	Orthocenter	5
1.2.a	Perpendicular bissector method	6
1.2.b	Product scalar method	8
1.2.c	Barycenter method	10
1.2.d	Archimedes method	13
1.3	Pythagoras' theorem	15
1.4	Table of variations and graph	17
1.4.a	Cartesian function	17
1.4.b	Parametric representation	20
1.5	Flowchart	23
1.6	Using the rotating package	25
2	Calculus P_{ic}T_EX and A_{dd}P_{ic}	29
2.1	Introduction	29
2.2	Calculus with T _E X	32
2.2.a	Addition	33
2.2.b	Multiplication	34
2.2.c	Division	35
2.3	Hypothenuse and square root	41
2.3.a	Hypothenuse	41
2.3.b	Square root	43
2.4	Sine and cosine	45
2.4.a	First method	45
2.4.b	Pade approximation method	47
2.5	Arctan	50
2.5.a	Polynomial approximation	51
2.5.b	Pade approximation method	53
2.6	Logarithm	54
2.6.a	P _{ic} T _E X method	54
2.6.b	Pade method	57
2.7	Exponential function	59
3	Positionning	63
3.1	Units and measures	63
3.1.a	Coordinate systems	63
3.1.a.i	Cartesian system	63
3.1.a.ii	Units and measures	64
3.1.b	Drawing axis	64
3.1.c	Convert rectangular	68
3.2	Sheet of paper	70

3.3	Rotation	72
3.3.a	Preamble	72
3.3.b	Rotation with <code>PicTeX</code>	72
3.3.c	Rotation with <code>rotate</code>	73
3.3.d	Rotation ellipse	74
3.4	Arrows axis	75
3.4.a	Arrows in <code>PicTeX</code>	76
3.4.b	Arrows axis in <code>AddPic</code>	76
3.4.c	Axis label	77
3.4.d	Utilities	77
	3.4.d.i Dashes	77
	3.4.d.ii Homothetic	78
	3.4.d.iii Text between two arrows	79
3.5	Positioning text	79
3.5.a	Putting text	79
3.5.b	Put with short code	81
	3.5.b.i Putshort	81
	3.5.b.ii Polar angle	84
	3.5.b.iii Polar put	87
3.5.c	Write put	89
3.5.d	Mark	91
	3.5.d.i Dashes and gaps	91
	3.5.d.ii Segment mark	93
	3.5.d.iii Line mark	94
3.6	Exercices	96
4	Lines, polygons and curves	103
4.1	Solid, shaded and dotted	103
	4.1.a Shade rectangle	105
	4.1.b Vertical and horizontal shade	108
4.2	Square shaded	115
4.3	Rectangles and histograms	121
	4.3.a Myrectangle	121
	4.3.b Histograms	123
4.4	Stochastic tree	129
4.5	Extended Euclidean algorithm	137
5	Arrows line and arrow arc	141
5.1	Rotate arrow	142
5.2	Arrow line	144
5.3	Arrows with or without text	145
	5.3.a Text and arrows	145
	5.3.b Rotate text	147
	5.3.c Arrows with or without text	148
	5.3.d Simple text and arrows	149
	5.3.e Horizontal text	150
	5.3.f Write text in invisible box	151
5.4	Arc of circle and arrow	153
5.5	Exercice	162

6	Curves and plot	167
6.1	Variation table	167
6.1.a	Double line	168
6.1.b	Arrow for table	169
6.1.c	Canvas for variation table	171
6.1.c.i	Canvas one	171
6.1.c.ii	Canvas two	173
6.1.c.iii	Canvas three	177
6.2	Ellipse an circle	182
6.3	Plot curve	186
6.4	Fourier series	208
7	Elements of geometry	211
7.1	Malus Problem	222
7.2	Exercices	226
7.3	Geometric properties of conics	233
7.3.a	Ellipse	233
7.3.b	Hyperbola	237
7.4	Geometrically defined curves	240
7.4.a	Hypocycloid	241
7.4.b	Hypotrochoid	243
7.4.c	Professor NIMBUS	244
7.4.d	Epicycloid	246
7.4.e	Epitrochoid	248
7.4.f	Power of point in the circle	249
8	Logic gates and flow chart	255
8.1	Preamble	255
8.2	True tables	262
8.2.a	NOT table	263
8.2.b	NAND table	263
8.2.c	NOR table	263
8.2.d	XOR table	266
8.3	Logic gates	267
8.3.a	Transistors	267
8.3.a.i	Resistance	267
8.3.a.ii	Earth	268
8.3.a.iii	Transistor NPN	270
8.3.a.iv	Electronic logic circuit	273
8.3.b	Symbol for electronic logic circuit	274
8.3.b.i	Gate NOT	275
8.3.b.ii	Gate NAND and AND	276
8.3.b.iii	Gate NOR and OR	280
8.3.b.iv	Gate XOR	285
8.4	Flowchart	293
8.4.a	Exemple of introduction	293
8.4.b	Arrow chart	298
8.4.c	Begin - End	300
8.4.d	Data - Exit	302

8.4.e	Calculus	304
8.4.f	Call sub routine	305
8.4.g	Test YES / NO	306
8.4.h	Examples of float chart	307
8.5	Cubic and fourth equations	308
9	Sudoku	323
9.1	Example 1 : easy	325
9.2	Example 2 : challenging	331
9.2.a	Fisrt step	332
9.2.b	Kamikaze step	333
9.2.c	Second step	334
9.2.d	Kamikaze step 2	334
9.2.e	Kamikaze first three	335
9.2.f	Happy end	335
9.3	3-doku	335