



BIBLIOTECA

## CONTENTS

### CHAPTER 1

#### ALGEBRAIC PRINCIPLES

Art.	PAGE
1. Constants and variables . . . . .	1
2. Equations . . . . .	3
3. Equations in one variable . . . . .	5
4. Factors and roots . . . . .	7
5. Approximate solution of equations . . . . .	9
6. Inequalities . . . . .	11
7. Simultaneous equations . . . . .	12
8. Special cases . . . . .	14
9. Undetermined coefficients . . . . .	16
10. Functions . . . . .	18

### CHAPTER 2

#### RECTANGULAR COÖRDINATES

11. Definitions . . . . .	23
12. Segments . . . . .	26
13. Projection . . . . .	27
14. Distance between two points . . . . .	29
15. Vectors . . . . .	32
16. Multiple of a vector . . . . .	35
17. Addition and subtraction of vectors . . . . .	36
18. Slope of a line . . . . .	39
19. Graphs . . . . .	43
20. Equation of a locus . . . . .	47
21. Point on a locus . . . . .	49
22. Tangent curves . . . . .	51

### CHAPTER 3

#### STRAIGHT LINE AND CIRCLE

23. Equation of a straight line . . . . .	54
24. First degree equation . . . . .	57
25. The expression $Ax + By + C$ . . . . .	60

ART.	PAGE
26. Distance from a point to a line . . . . .	61
27. Equation of a circle . . . . .	64
28. Circle determined by three conditions . . . . .	66

## CHAPTER 4

## SECOND DEGREE EQUATIONS

29. The ellipse . . . . .	70
30. The ellipse in other positions . . . . .	71
31. The parabola . . . . .	74
32. The hyperbola . . . . .	77
33. The rectangular hyperbola . . . . .	80
34. The second degree equation . . . . .	83
35. Locus problems . . . . .	87

## CHAPTER 5

## GRAPHS AND EMPIRICAL EQUATIONS

36. Intersections with the coördinate axes . . . . .	90
37. Real and imaginary coördinates . . . . .	92
38. Symmetry . . . . .	93
39. Infinite values . . . . .	95
40. Direction of the curve . . . . .	96
41. Sine curves . . . . .	99
42. Periodic functions . . . . .	102
43. Exponential and logarithmic curves . . . . .	104
44. Empirical equations . . . . .	107

## CHAPTER 6

## POLAR COÖRDINATES

45. Definitions . . . . .	113
46. Change of coördinates . . . . .	116
47. Straight line and circle . . . . .	117
48. The conic . . . . .	117
49. Graphing equations . . . . .	121
50. Intersections of curves . . . . .	124
51. Locus problems . . . . .	127

## CHAPTER 7

## PARAMETRIC REPRESENTATION

52. Definition of parameter . . . . .	130
53. Locus of parametric equations . . . . .	132
54. Parametric from coördinate equations . . . . .	135
55. Locus problems . . . . .	138

## CHAPTER 8

## TRANSFORMATION OF COÖRDINATES

ART.	PAGE
56. Translation of the axes . . . . .	142
57. Rotation of the axes . . . . .	144
58. Invariants . . . . .	145
59. General equation of the second degree . . . . .	146

## CHAPTER 9

## COÖRDINATES OF A POINT IN SPACE

60. Rectangular coördinates . . . . .	150
61. Projection . . . . .	151
62. Distance between two points . . . . .	154
63. Vectors . . . . .	155
64. Direction of a line . . . . .	156
65. The angle between two directed lines . . . . .	158
66. Cylindrical and spherical coördinates . . . . .	160

## CHAPTER 10

## SURFACES

67. Loci . . . . .	163
68. Equation of a plane . . . . .	163
69. Equation of a sphere . . . . .	167
70. Equation of a cylindrical surface . . . . .	167
71. Surface of revolution . . . . .	168
72. Graph of an equation . . . . .	170

## CHAPTER 11

## LINES AND CURVES

73. The straight line . . . . .	176
74. Curves . . . . .	178
75. Parametric equations . . . . .	180

