

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 Δ	39
19. Graphs \star	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