

Contents

<i>Foreword</i>	<i>iii</i>
<i>Rationalisation of Contents in the Textbooks</i>	<i>v</i>
<i>Preface</i>	<i>vii</i>
1. Real Numbers	1
1.1 Introduction	1
1.2 The Fundamental Theorem of Arithmetic	2
1.3 Revisiting Irrational Numbers	6
1.4 Summary	9
2. Polynomials	10
2.1 Introduction	10
2.2 Geometrical Meaning of the Zeroes of a Polynomial	11
2.3 Relationship between Zeroes and Coefficients of a Polynomial	18
2.4 Summary	23
3. Pair of Linear Equations in Two Variables	24
3.1 Introduction	24
3.2 Graphical Method of Solution of a Pair of Linear Equations	25
3.3 Algebraic Methods of Solving a Pair of Linear Equations	30
3.3.1 Substitution Method	30
3.3.2 Elimination Method	34
3.4 Summary	37
4. Quadratic Equations	38
4.1 Introduction	38
4.2 Quadratic Equations	39
4.3 Solution of a Quadratic Equation by Factorisation	42
4.4 Nature of Roots	44
4.5 Summary	47
5. Arithmetic Progressions	49
5.1 Introduction	49

5.2	Arithmetic Progressions	51
5.3	n th Term of an AP	56
5.4	Sum of First n Terms of an AP	63
5.5	Summary	72
6.	Triangles	73
6.1	Introduction	73
6.2	Similar Figures	74
6.3	Similarity of Triangles	79
6.4	Criteria for Similarity of Triangles	85
6.5	Summary	97
7.	Coordinate Geometry	99
7.1	Introduction	99
7.2	Distance Formula	100
7.3	Section Formula	106
7.4	Summary	112
8.	Introduction to Trigonometry	113
8.1	Introduction	113
8.2	Trigonometric Ratios	114
8.3	Trigonometric Ratios of Some Specific Angles	121
8.4	Trigonometric Identities	128
8.5	Summary	132
9.	Some Applications of Trigonometry	133
9.1	Heights and Distances	133
9.2	Summary	143
10.	Circles	144
10.1	Introduction	144
10.2	Tangent to a Circle	145
10.3	Number of Tangents from a Point on a Circle	147
10.4	Summary	153
11.	Areas Related to Circles	154
11.1	Areas of Sector and Segment of a Circle	154
11.2	Summary	160

12. Surface Areas and Volumes	161
12.1 Introduction	161
12.2 Surface Area of a Combination of Solids	162
12.3 Volume of a Combination of Solids	167
12.4 Summary	170
13. Statistics	171
13.1 Introduction	171
13.2 Mean of Grouped Data	171
13.3 Mode of Grouped Data	183
13.4 Median of Grouped Data	188
13.5 Summary	200
14. Probability	202
14.1 Probability — A Theoretical Approach	202
14.2 Summary	217
Appendix A1 : Proofs in Mathematics	218
A1.1 Introduction	218
A1.2 Mathematical Statements Revisited	218
A1.3 Deductive Reasoning	221
A1.4 Conjectures, Theorems, Proofs and Mathematical Reasoning	223
A1.5 Negation of a Statement	228
A1.6 Converse of a Statement	231
A1.7 Proof by Contradiction	234
A1.8 Summary	238
Appendix A2 : Mathematical Modelling	239
A2.1 Introduction	239
A2.2 Stages in Mathematical Modelling	240
A2.3 Some Illustrations	244
A2.4 Why is Mathematical Modelling Important?	248
A2.5 Summary	249
Answers/Hints	250