

CURRICULUM FRAMEWORK

● Numbers and Algebra

● Geometry and Measurement

● Statistics and Probability

Discovering Mathematics 1

Chapter 1

● Factors And Multiples

- 1.1 Primes, Prime Factorisation and Index Notation
- 1.2 Highest Common Factor (HCF)
- 1.3 Lowest Common Multiple (LCM)
- 1.4 Square Roots and Cube Roots

Chapter 2

● Real Numbers

- 2.1 Idea of Negative Numbers and the Number Line
- 2.2 Addition and Subtraction of Integers
- 2.3 Multiplication, Division and Combined Operations of Integers
- 2.4 Rational Numbers
- 2.5 Real Numbers and Summary of the Use of Calculators

Chapter 3

● Approximation And Estimation

- 3.1 Rounding Off Numbers to Decimal Places
- 3.2 Rounding Off Numbers to Significant Figures
- 3.3 Estimation

Chapter 4

● Introduction To Algebra

- 4.1 The Use of Letters in Algebra
- 4.2 Evaluation of Algebraic Expressions and Formulae
- 4.3 Translation of Real-world Situations into Algebraic Expressions

Chapter 5

● Algebraic Manipulation

- 5.1 Like Terms and Unlike Terms
- 5.2 Addition and Subtraction of Linear Expressions
- 5.3 Simplification of Linear Expressions
- 5.4 Factorisation by Using Common Factors

Chapter 6

● Simple Equations In One Variable

- 6.1 Simple Linear Equations in One Variable
- 6.2 Equations Involving Brackets
- 6.3 Simple Fractional Equations
- 6.4 Forming Linear Equations to Solve Problems

Chapter 7

● Angles And Parallel Lines

- 7.1 Points, Lines and Planes
- 7.2 Angles
- 7.3 Parallel Lines and Transversals
- 7.4 Perpendicular Bisectors and Angle Bisectors

Chapter 8

● Triangles And Polygons

- 8.1 Triangles
- 8.2 Quadrilaterals
- 8.3 Polygons
- 8.4 Construction of Triangles and Quadrilaterals

Chapter 9

● Ratio, Rate And Speed

- 9.1 Ratio
- 9.2 Rate
- 9.3 Speed

Chapter 10

● Percentage

- 10.1 Simple Percentage Problems
- 10.2 Reverse Percentages
- 10.3 Percentage Increase and Decrease
- 10.4 Discount and GST

Chapter 11

● Number Patterns

- 11.1 Number Patterns and Sequences
- 11.2 General Term of a Sequence

Chapter 12

● Coordinates And Linear Functions

- 12.1 Cartesian Coordinate System
- 12.2 Idea of a Function
- 12.3 Linear Functions and Their Graphs
- 12.4 Gradients of Linear Graphs

Chapter 13

● Simple Inequalities

- 13.1 Solving Simple Inequalities
- 13.2 Applications of Simple Inequalities

Chapter 14

● Perimeter And Area Of Plane Figures

- 14.1 Area of Parallelograms
- 14.2 Area of Trapeziums
- 14.3 Perimeter and Area of Composite Plane Figures

Chapter 15

● Volume And Surface Area Of Solids

- 15.1 Views and Nets of 3D Shapes
- 15.2 Volume and Total Surface Area of Prisms
- 15.3 Volume and Total Surface Area of Cylinders
- 15.4 Volume and Surface Area of Composite Solids

Chapter 16

● Data Handling

- 16.1 Collection of Data
- 16.2 Organisation of Data
- 16.3 Pictograms and Bar Graphs
- 16.4 Line Graphs and Pie Charts
- 16.5 Use and Misuse of Statistical Graphs

Discovering Mathematics 2

Chapter 1

● Proportion

- 1.1 Map Scale
- 1.2 Direct Proportion
- 1.3 Inverse Proportion

Chapter 2

● Expansion And Factorisation Of Algebraic Expressions

- 2.1 Quadratic Expressions
- 2.2 Expansion of the Product of Algebraic Expressions
- 2.3 Factorisation of $ax^2 + bx + c$
- 2.4 Special Products of Algebraic Expressions
- 2.5 Factorisation by Using Special Products of Algebraic Expressions
- 2.6 Factorisation by Grouping Terms

Chapter 3

● Simple Algebraic Fractions

- 3.1 Simplifying Simple Algebraic Fractions
- 3.2 Multiplication and Division of Algebraic Fractions
- 3.3 Addition and Subtraction of Algebraic Fractions
- 3.4 Evaluation of an Unknown Quantity in a Formula
- 3.5 Changing the Subject of a Formula

Chapter 4

● Quadratic Functions And Equations

- 4.1 Graphs of Quadratic Functions
- 4.2 Solving Quadratic Equations by Factorisation
- 4.3 Applications of Quadratic Equations

Chapter 5

● Linear Equations In Two Variables

- 5.1 Linear Equations in Two Variables
- 5.2 Solving Simultaneous Linear Equations in Two Variables by Graphical Method
- 5.3 Solving Simultaneous Linear Equations in Two Variables by Substitution Method
- 5.4 Solving Simultaneous Linear Equations in Two Variables by Elimination Method
- 5.5 Solving Problems Using Simultaneous Equations

Chapter 6

● Congruence And Similarity

- 6.1 Congruence
- 6.2 Similarity
- 6.3 Scale Factor
- 6.4 Scale Drawing

Chapter 7

● Pythagoras' Theorem

- 7.1 Pythagoras' Theorem
- 7.2 Application of Pythagoras' Theorem
- 7.3 Converse of Pythagoras' Theorem

Chapter 8

● Trigonometric Ratios Of Acute Angles

- 8.1 Trigonometric Ratios of Acute Angles
- 8.2 Finding Unknown Angles in a Right-angled Triangle

Chapter 9

● Mensuration Of Pyramids, Cones And Spheres

- 9.1 Pyramids
- 9.2 Cones
- 9.3 Spheres

Chapter 10

● Data Analysis

- 10.1 Dot Diagrams
- 10.2 Histograms
- 10.3 Stem-and-leaf Diagrams
- 10.4 Mean
- 10.5 Median
- 10.6 Mode

Chapter 11

● Probability

- 11.1 The Meaning of Probability
- 11.2 Probability of Single Events

Discovering Mathematics 3

Chapter 1

● Indices

- 1.1 Positive Indices and Laws Of Indices
- 1.2 Zero and Negative Integral Indices
- 1.3 Fractional Indices
- 1.4 Standard Form
- 1.5 Comparing Indices
- 1.6 Calculation of Compound Interest

Chapter 2

● More About Quadratic Equations

- 2.1 Factorisation Method
- 2.2 Graphical Method
- 2.3 Completing the Square Method
- 2.4 Quadratic Formula
- 2.5 Fractional Equations
- 2.6 Problems Involving Quadratic Equations
- 2.7 Sketching the Graphs of Quadratic Equations

Chapter 3

● Linear Inequalities

- 3.1 Basic Properties of Inequalities
- 3.2 Linear Inequalities in One Variable
- 3.3 Simultaneous Linear Inequalities
- 3.4 Applications of Linear Inequalities

Chapter 4

● Conditions Of Congruence And Similarity

- 4.1 Congruent Triangles
- 4.2 Similar Triangles
- 4.3 Ratio of Areas of Similar Plane Figures
- 4.4 Ratio of Volumes of Similar Solids

Chapter 5

● Coordinate Geometry

- 5.1 Length of a Line Segment
- 5.2 Gradient of a Straight Line
- 5.3 Equation of a Straight Line
- 5.4 Geometric Problems Involving the Use of Coordinates

Chapter 6

● Functions And Graphs

- 6.1 Graphs of Power Functions
- 6.2 Graphs of Simple Sums Of Power Functions
- 6.3 Graphs of Exponential Functions
- 6.4 Gradients of Curves
- 6.5 Graphs in Practical Situations

Chapter 7

● Trigonometry

- 7.1 Further Problems of Trigonometric Ratios of Acute Angles
- 7.2 Sine and Cosine Ratios of Obtuse Angles
- 7.3 Formula For the Area of a Triangle
- 7.4 The Sine Rule
- 7.5 The Cosine Rule

Chapter 8

● Applications Of Trigonometry

- 8.1 Bearing Problems
- 8.2 Angles Of Elevation and Depression
- 8.3 Simple Three-dimensional Problems

Chapter 9

● Arc Lengths, Sector Areas And Radian Measure

- 9.1 Arc Lengths
- 9.2 Sector Areas and Segment Areas
- 9.3 Radian Measure
- 9.4 Formulae in Radian Measure

Chapter 10

● Properties Of Circles

- 10.1 Chords of a Circle
- 10.2 Angles in a Circle
- 10.3 Angles in Opposite Segments
- 10.4 Tangents to a Circle

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Chapter 1

● Set Language And Notation

- 1.1 Set Language
- 1.2 Venn Diagrams and Complement of a Set
- 1.3 Union and Intersection of Sets

Chapter 2

● Data Analysis - Measures Of Speed

- 2.1 Cumulative Frequency Diagrams
- 2.2 Range, Quartiles, Interquartile Range and Percentiles
- 2.3 Box-and-Whisker Plots
- 2.4 Standard Deviation for Ungrouped Data
- 2.5 Standard Deviation for Grouped Data

Chapter 3

● Probability

- 3.1 Probabilities of Simple Combined Events
- 3.2 Addition of Probabilities
- 3.3 Multiplication of Probabilities

Chapter 4

● Matrices

- 4.1 Definition of a Matrix
- 4.2 Addition and Subtraction of Matrices
- 4.3 Multiplication of a Matrix by a Scalar
- 4.4 Multiplication of Matrices

Chapter 5

● Vectors In Two Dimensions

- 5.1 Introduction to Vectors
- 5.2 Operations on Vectors
- 5.3 Position Vectors
- 5.4 Applications of Vectors in Geometry