Mathematics

Year 9

1. Number and Financial Mathematics
- Integer operations
- Decimals and rounding
- Rational numbers
- Operations with fractions
- Ratios, rates and best buys
- Percentages and money
- Percentage increase and decrease
- Profits and discounts
- Income and taxation
- Simple interest
- Compound interest

2. Linear and Simultaneous Equations
- Algebraic expressions
- Simplifying algebraic expressions
- Expanding algebraic expressions
- Solving linear equations
- Equations with brackets and variables on both sides
- Solving word problems
- Inequalities
- Using formulas
- Simultaneous equations: substitution
- Simultaneous equations: elimination
- Applications of simultaneous equations

3. Pythagoras theorem and Trigonometry
- Pythagoras' theorem
- Finding the shorter sides
- Applying Pythagoras' theorem
- Pythagoras in three dimensions
- Trigonometric ratios
- Finding side lengths
- Solving for the denominator
- Finding an angle
- Applying trigonometry
- Bearings

4.   Linear Relations
- Introduction to linear relations
- Graphing straight lines with intercepts
- Lines with one intercept
- Gradient
- Gradient and direct proportion
- Gradient–intercept form
- Finding the equation of a line
- Midpoint and length of a line segment
- Perpendicular and parallel lines
- Linear modelling
- Graphical solutions to simultaneous equations

5.   Measurements
- Length
- Circumference and perimeter of a sector
- Area
- Composite shapes
- Surface area of prisms and pyramids
- Surface area of a cylinder
- Volume
- Volume of a cylinder and Applications

6.   Indices and Surds
- Index notation
- Index laws 1 and 2
- Index law 3 and the zero power
- Index laws 4 and 5
- Negative indices
- Scientific notation
- Scientific notation using significant figures
- Fractional indices and surds
- Simple operations with surds

7.   Geometry
- Angles and triangles
- Parallel lines
- Quadrilaterals and other polygons
- Congruent triangles
- Using congruence in proof
- Enlargement and similar figures
- Similar triangles, Proving and applying similar triangles

8. **Algebraic Techniques**
- Expanding binomial products
- Perfect squares and difference of perfect squares
- Factorising algebraic expressions
- Factorising the difference of two squares
- Factorisation by grouping
- Factorising quadratic trinomials
- Factorising trinomials of the form $ax^2 + bx + c$
- Simplifying algebraic fractions: multiplication and division
- Simplifying algebraic fractions: addition and subtraction
- Further simplification of algebraic fractions
- Equations with algebraic fractions
- Problem solving

9. **Probability**
- Probability review
- Venn diagrams and two-way tables
- Using set notation
- Multiple events using tables
- Tree diagrams
- Experimental probability
- Worded questions and applications

10. **Statistics**
- Summarising data: measures of centre
- Stem-and-leaf plots
- Grouped data
- Measures of spread
- Box plots

11. **Introduction to Quadratic Equations and Graphs**
- Quadratic equations
- Solving $ax^2 + bx = 0$ and $x^2 - d^2 = 0$
- Solving $x^2 + bx + c = 0$
- Applications of quadratic equations
- The parabola
- Sketching $y = ax^2$ with dilations and reflections
- Translations of $y = x^2$
- Sketching parabolas using intercept form

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