OCR
GCSE (9–1) in Mathematics (J560)

Specification Summary

Number Operations and Integers
Calculations with integers
Four rules

Whole number theory
Definitions and terms
Prime numbers
Highest Common Factor (HCF) and
Lowest Common Multiple (LCM)

Combining arithmetic operations
Inverse operations

Fractions, Decimals and Percentages
Fractions
Equivalent fractions
Calculations with fractions
Fractions of a quantity

Decimal fractions

Percentage conversions
Percentage calculations
Percentage change

Ordering fractions, decimals and percentages

Ascending, Descending

Indices and Surds

Powers and roots
Index notation
Calculation and estimation of powers and roots
Laws of indices

Standard form

Interpret and order numbers expressed in standard form.
Calculations with numbers in standard form

Exact calculations

Use fractions in exact calculations without a calculator.
Manipulating surds

Approximation and Estimation

Round numbers to the nearest whole number, ten, hundred, etc. or to a given number of significant figures (sf) or decimal places (dp).
Estimate or check, without a calculator, the result of a calculation by using suitable approximations. e.g. Estimate, to one significant figure, the cost of 2.8 kg of potatoes at 68p per kg
Upper and lower bounds

Ratio, Proportion and Rates Of Change

Calculations with ratio
Equivalent ratios
Find the ratio of quantities in the form a : b and simplify. Find the ratio of quantities in the form 1 : n. e.g. 50 cm : 1.5 m = 50 : 150 = 1 : 3
Division in a given ratio
Ratios and fractions
Solve ratio and proportion problems

Direct and inverse proportion

Direct proportion
Inverse proportion

Discrete growth and decay

Growth and decay
Calculate simple interest including in financial contexts

Algebra

Algebraic expressions
Algebraic terminology and proofs
Collecting like terms in sums and differences of terms
Simplifying products and quotients
Multiplying out brackets
Factorising
Completing the square
Algebraic fractions

Algebraic formulae

Formulate algebraic expressions
Substitute numerical values into formulae and expressions
Change the subject of a formula
Recall and use standard formulae

Use kinematics formulae

Algebraic equations

Linear equations in one unknown
Quadratic equations
Simultaneous equations
Approximate solutions using a graph
Approximate solutions by iteration

Algebraic inequalities

Inequalities in one variable
Inequalities in two variables
Language of functions
Functions

Sequences

Generate terms of a sequence
Special sequences

Graphs of Equations and Functions

x- and y-coordinates
Graphs of equations and functions
Polynomial and exponential functions
Exponential functions
Trigonometric functions
Equations of circles

Straight line graphs

Find and interpret the gradient and intercept of straight lines, graphically and
using $y = mx + c$.
Parallel and perpendicular lines

Transformations of curves and their equations

Translations and reflections
Interpreting graphs
Graphs of real-world contexts
Gradients
Areas

Basic Geometry

Conventions, notation and terms Learners will be expected to be familiar with the following geometrical skills, conventions, notation and terms, which will be assessed in questions at both tiers.
2D and 3D shapes
Angles
Polygons
Polyhedra and other solids
Diagrams
Geometrical instruments
x- and y-coordinates

Ruler and compass constructions

Perpendicular bisector
Angle bisector
Perpendicular from a point to a line
Loci

Angles

Angles at a point
Angles on a line
Angles between intersecting and parallel lines
Angles in polygons

Properties of polygons

Properties of a triangle
Properties of quadrilaterals
Symmetry

Circles

Circle nomenclature
Understand and use the terms centre, radius, chord, diameter and circumference.
Angles subtended at centre and circumference
Angle in a semicircle
Angles in the same segment
Angle between radius and chord
Angle between radius and tangent
The alternate segment theorem
Cyclic quadrilaterals
Three-dimensional shapes
3-dimensional solids
Plans and elevations

Congruence and Similarity

Plane isometric transformations
Reflection
Rotation
Translation
Combinations of transformations

Congruence

Congruent triangles
Applying congruent triangles

Vector arithmetic

Plane vector geometry

Column vectors
Similarity
Enlargement
Similar shapes

Mensuration

Units and measurement
Compound units
Maps and scale drawings

Perimeter calculations

Perimeter of rectilinear shapes
Circumference of a circle
Perimeter of composite shapes
Area calculations
Area of a parallelogram
Area of a trapezium
Area of a circle
Area of composite shapes
Volume and surface area calculations
Calculate the surface area and volume of cuboids and other right prisms (including cylinders).
Cones and spheres
Pyramids

Triangle mensuration

Pythagoras' theorem
Trigonometry in right-angled triangles
Exact trigonometric ratios
Sine rule
Cosine rule

Probability

Basic probability and experiments
The probability scale
Relative frequency
Relative frequency and probability
Equally likely outcomes and probability

Combined events and probability diagrams

Sample spaces
Enumeration
Venn diagrams and sets
Tree diagrams
The addition law of probability
The multiplication law of probability and conditional probability

Statistics

Sampling
Populations and samples
Interpreting and representing data
Categorical and numerical data
Grouped data

Analysing data

Summary statistics
Misrepresenting data
Bivariate data
Outliers