

Advance Information for Summer 2022

GCSE (9–1)

Mathematics

J560

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Information

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- This document has **20** pages.

Advice

- The information is presented in Section A at paper level and in Section B at tier level.
- The information is presented in approximate specification order and not in question order. Any given question may require content from more than one description.
- Topics not explicitly given in the list may appear in low tariff items or via synoptic questions.
- It is advised that teaching and learning should still cover the entire subject content in the specification.
- You should consider how you revise other parts of the specification, for example to review whether other topics may provide knowledge which helps your understanding in relation to the areas being tested in 2022.
- Students and teachers can discuss this notice.

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SECTION A

J560/01 Paper 1 Foundation Tier

Number OCR1 OCR2 OCR3 OCR4

Content section	Description
Arithmetic	Four rules with integers
	Money calculations
	Priority of operations
	Inverse operations
Whole number theory	Understand number definitions and terms
	Prime numbers
Fractions	Fraction, decimals and percentages
	Fraction of a quantity
Percentages	Percentages of quantities
	Percentage change
	Reverse percentages
Ordering fractions, decimals and percentages	Listing in order
Calculator	Use of calculator
Standard form	Standard form notation
Approximation and estimation	Rounding
	Upper and lower bounds

Ratio, proportion and rate of change OCR5

Content section	Description
Calculations with ratio	Share into a ratio
	Use a ratio

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Simplifying algebraic expressions
	Factorising expressions
Algebraic equations	Linear equations
Inequalities	Solving inequalities
Language of functions	Function machines
Graphs	Quadratic graphs

Geometry OCR8, OCR9, OCR10

Content section	Description
Conventions, notation and terms	Polygons
Angles	Properties of parallel lines
3-dimensional solids	Properties of solids
Vectors	Column vectors
Units of measurement	Time
Compound units	Rates
Area calculations	Area of a rectangle
	Area of a circle
	Area of composite shapes
Volume and surface area calculations	Volume including cylinder, pyramid and sphere

Probability OCR11

None

Statistics OCR12

Content section	Description
Analysing data	Averages and range
	Scatter diagram and correlation
	Graphical misrepresentation
Interpreting and representing data	Frequency tree

J560/02 Paper 2 Foundation Tier**Number** OCR1, OCR2, OCR3, OCR4

Content section	Description
Calculations with integers	Arithmetic with positive and negative numbers
	Division of a quantity
Whole number theory	Prime factors
Fractions	Fraction, decimals and percentages
	Fractions of a quantity
	Fraction arithmetic
Decimal fractions	Calculations with decimals
Percentages	Percentage conversions
	Percentage of a quantity
Standard form	Standard form calculations

Ratio, proportion and rate of change OCR5

Content section	Description
Calculations with ratio	Simplify ratio
	Interpreting ratio
Direct and inverse proportion	Inverse proportion

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Multiplying out brackets
	Formulate algebraic expressions
Algebraic equations	Equations and identities
	Solve linear equations
	Solve quadratic equations
	Rearrange equations
Graphs	Equation of a straight line

Geometry OCR8, OCR9, OCR10

Content section	Description
Ruler and compass constructions	Construct and interpret angle bisector, line bisector and distance from a point.
Similarity	Transformations
Units of measurement	Money
Maps and scale diagrams	Bearings
Area calculations	Area of a triangle
Triangle mensuration	Trigonometry
	Exact trigonometric ratios

Probability OCR11

Content section	Description
Basic probability and experiments	Probability of equally likely events
	Relative frequency

Statistics OCR12

Content section	Description
Interpreting and representing data	Bar chart and pie chart

J560/03 Paper 3 Foundation Tier**Number OCR1, OCR2, OCR3, OCR4**

Content section	Description
Arithmetic	Calculations with integers
	Calculations with decimals
Whole number theory	Prime numbers
	Factors, multiples and LCM
	Sequence rule to find a term
	Understand number definitions and terms
Fractions	Fractions, decimals and percentages
	Fraction of a quantity
	Fraction arithmetic
Percentages	Percentage of a quantity
	Percentage change
Powers and roots	Powers of integers
Calculator	Use of calculator

Ratio, proportion and rate of change OCR5

Content section	Description
Calculations with ratio	Write in a ratio
	Simplify a ratio
	Calculate with proportions
	Share in a ratio
Direct and inverse proportion	Direct proportion
Growth and decay	Simple interest
	Growth and decay problems and graphs

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Simply algebraic products and quotients
	Multiply out brackets and simplify
	Factorise quadratic expressions
Algebraic formulae	Substitute into an expression
Algebraic equations	Solve linear equation
	Solve simultaneous equations
Sequences	Continue sequence
Graphs	Quadratic graphs
	Graphs of real-world contexts

Geometry OCR8, OCR9, OCR10

Content section	Description
Conventions, notation and terms	Symmetry
	Circle terms
Properties of polygons	Quadrilaterals
Units of measurement	Mass, Volume, Density
Perimeter calculations	Perimeters of triangles and quadrilaterals
Volume and surface area calculations	Cuboid and prism

Probability OCR11

Content section	Description
Basic probability and experiments	Understand the probability scale
	Probability calculation
Combined events and probability diagrams	Listing outcomes and related probabilities
	Tree diagram
	Calculation with the laws of probability

Statistics OCR12

Content section	Description
Analysing data	Averages

J560/04 Paper 4 Higher Tier**Number** OCR1, OCR2, OCR3, OCR4

Content section	Description
Calculator	Quotients
Combining arithmetic operations	Priority of operations
Percentages	Percentage calculations
	Percentage change
	Reverse percentages
Approximation and estimation	Upper and lower bounds
Standard form	Standard form representation
Equivalence	Decimal, fractions and percentages

Ratio, proportion and rate of change OCR5

Content section	Description
Direct and inverse proportion	Direct proportion
	Solve ratio and proportion problems
Growth and decay	Growth and decay problems

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Factorise quadratic expressions
	Multiplying out brackets
	Algebraic fractions
	Substitute values into expressions
	Formulate algebraic expressions
	Use of brackets
Algebraic inequalities	Solving inequalities
Graphs of equations and functions	Drawing and interpreting graphs
	Quadratic graphs
	Equations of circles
Proof	Algebraic proofs

Geometry OCR8, OCR9, OCR10

Content section	Description
Conventions, notation and terms	Properties of a triangle
	Circle terms
Angles	Angles in polygons
	Angle properties of parallel lines
Units of measurement	Units of length and time
Compound units	Rates
Volume and surface area calculations	Volume of pyramid and sphere
Circle geometry	Standard circle theorems
	Circumference of a circle
Triangle mensuration	Pythagoras' Theorem

Probability OCR11

Content section	Description
Combined events and probability diagrams	Enumeration
	Calculation with the laws of probability
	Conditional probability

Statistics OCR12

Content section	Description
Interpreting and representing data	Collecting data
	Scatter diagrams and outliers

J560/05 Paper 5 Higher Tier**Number** OCR1, OCR2, OCR3, OCR4

Content section	Description
Arithmetic	Fraction arithmetic
	Decimal arithmetic
Whole number theory	Types of numbers
	Factors and multiples
Fractions	Decimals and fractions
	Recurring decimals
Percentages	Percentage calculations
	Percentage change
Powers and roots	Index notation
	Powers of integers
	Laws of indices
	Surds and exact calculations
Approximation and estimation	Rounding
	Estimation
Standard form	Standard form representation
	Standard form calculation

Ratio, proportion and rate of change OCR5

Content section	Description
Ratios	Simplify ratios
	Use ratio
Direct and inverse proportion	Inverse proportion

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Simplifying algebraic expressions
	Formulate algebraic expressions
	Multiplying out brackets
	Rearranging formulae
	Substitute values into expressions
	Use of brackets
Algebraic formulae	Use kinematics formulae
Algebraic equations	Quadratic equations
	Approximate solutions by iteration

Content section	Description
Graphs of equations and functions	Equations of circles
	Drawing and interpreting graphs
	Distance/speed – time graphs
Straight line graphs	Parallel and perpendicular lines
	Equation of a line

Geometry OCR8, OCR9, OCR10

Content section	Description
Units and measurement	Units of speed, distance and time
Plane isometric transformations	Transformations
Constructions and loci	Construct loci
	Maps, bearings and scale drawings
Circle geometry	Circumference of a circle and length of an arc
Area calculations	Area of a rectangle
Triangle mensuration	Trigonometry
	Exact trigonometric ratios

Probability OCR11

Content section	Description
Basic probability and experiments	Relative frequency
	Equally likely outcomes and probability
Combined events and probability diagrams	Venn diagrams and sets
	Conditional probability

Statistics OCR12

Content section	Description
Analysing Data	Graphical misrepresentation
Interpreting and representing data	Pie chart
	Line graph and time series

J560/06 Paper 6 Higher Tier**Number OCR1, OCR2, OCR3, OCR4**

Content section	Description
Whole number theory	Types of numbers
	Factors and multiples
Percentages	Percentage change
	Reverse percentages
Powers and roots	Index notation
	Laws of indices
Approximation and estimation	Rounding
Standard form	Standard form calculation

Ratio, proportion and rate of change OCR5

Content section	Description
Ratios	Use ratio
	Calculate with proportions
Direct and inverse proportion	Direct proportion
Growth and decay	Growth and decay problems

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Simplifying algebraic expressions
	Completing the square
	Multiplying out brackets
	Formulate algebraic expressions
	Rearranging formulae
	Factorise expressions
	Use of brackets
Algebraic equations	Linear equations
	Quadratic equations
Algebraic inequalities	Graphical inequalities
Graphs of equations and functions	Features and types of graphs
	Trigonometric graphs
	Transformations of graphs
	Drawing and interpreting graphs
	Solution set for inequalities

Geometry OCR8, OCR9, OCR10

Content section	Description
Congruency	Reasons for congruency
Similarity	Length, area and volume scale factors of similar figures
Units of measurement	Units of money, distance, time, density, mass, volume and area.
Area calculations	Area of a triangle
Volume and surface area calculations	Cuboid and prism
Circle geometry	Area and circumference of a circle
Triangle mensuration	Trigonometry
	Solving non-right-angled triangles

Probability OCR11

Content section	Description
Basic probability and experiments	Equally likely outcomes and probability
Combined events and probability diagrams	Sample spaces
	Enumeration
	Calculation with the laws of probability
	Conditional probability

Statistics OCR12

Content section	Description
Interpreting and representing data	Cumulative frequency

SECTION B

FOUNDATION TIER

Number OCR1, OCR2, OCR3, OCR4

Content section	Description
Arithmetic	Four rules with integers
	Money calculations
	Priority of operations
	Inverse operations
Whole number theory	Understand number definitions and terms
	Prime numbers
	Factors, multiples and LCM
	Sequence rule to find a term
Calculations with integers	Arithmetic with positive and negative numbers
	Division of a quantity
	Calculations with decimals
Fractions	Fraction, decimals and percentages
	Fraction of a quantity
	Fraction arithmetic
Percentages	Percentage conversions
	Percentages of quantities
	Percentage change
	Reverse percentages
Powers and roots	Powers of integers
Ordering fractions, decimals and percentages	Listing in order
Calculator	Use of calculator
Standard form	Standard form notation
	Standard form calculations
Approximation and estimation	Rounding
	Upper and lower bounds

Ratio, proportion and rate of change OCR5

Content section	Description
Calculations with ratio	Write in a ratio
	Simplify ratio
	Share into a ratio
	Use a ratio
	Interpreting ratio
	Calculate with proportions
Direct and inverse proportion	Direct proportion
	Inverse proportion
Growth and decay	Simple interest
	Growth and decay problems and graphs

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Factorising expressions including quadratic expressions
	Simplifying algebraic expressions
	Multiplying out brackets and simplify
	Simply algebraic products and quotients
	Formulate algebraic expressions
Algebraic formulae	Substitute into an expression
Algebraic equations	Equations and identities
	Solve linear equations
	Solve quadratic equations
	Solve simultaneous equations
	Rearrange equations
Sequences	Continue sequence
Inequalities	Solving inequalities
Language of functions	Function machines
Graphs	Equation of a straight line
	Quadratic graphs
	Graphs of real-world contexts

Geometry OCR8, OCR9, OCR10

Content section	Description
Conventions, notation and terms	Symmetry
	Circle terms
	Polygons
Ruler and compass constructions	Construct and interpret angle bisector, line bisector and distance from a point.
Angles	Properties of parallel lines
Properties of polygons	Quadrilaterals
3-dimensional solids	Properties of solids
Similarity	Transformations
Vectors	Column vectors
Units of measurement	Time, Money, Mass, Volume, Density
Compound units	Rates
Maps and scale diagrams	Bearings
Perimeter calculations	Perimeters of triangles and quadrilaterals
Area calculations	Area of a rectangle
	Area of a triangle
	Area of a circle
	Area of composite shapes
Volume and surface area calculations	Volume and surface area including cuboid, prism, cylinder, pyramid and sphere
Triangle mensuration	Trigonometry
	Exact trigonometric ratios

Probability OCR11

Content section	Description
Basic probability and experiments	Understand the probability scale
	Probability of equally likely events
	Relative frequency
	Probability calculation
Combined events and probability diagrams	Listing outcomes and related probabilities
	Tree diagram
	Calculation with the laws of probability

Statistics OCR12

Content section	Description
Analysing data	Averages and range
	Scatter diagram and correlation
	Graphical misrepresentation
Interpreting and representing data	Bar chart and pie chart
	Frequency tree

HIGHER TIER**Number OCR1, OCR2, OCR3, OCR4**

Content section	Description
Arithmetic	Fraction arithmetic
	Decimal arithmetic
Whole number theory	Types of numbers
	Factors and multiples
Calculator	Quotients
Combining arithmetic operations	Priority of operations
Fractions	Decimals and fractions
	Recurring decimals
Percentages	Percentage calculations
	Percentage change
	Reverse percentages
Powers and roots	Index notation
	Powers of integers
	Laws of indices
	Surds and exact calculations
Approximation and estimation	Rounding
	Upper and lower bounds
	Estimation
Standard form	Standard form representation
	Standard form calculation
Equivalence	Decimals, fractions and percentages

Ratio, proportion and rate of change OCR5

Content section	Description
Ratios	Simplify ratios
	Use ratio
	Calculate with proportions
Direct and inverse proportion	Direct proportion
	Solve ratio and proportion problems
	Inverse proportion
Growth and decay	Growth and decay problems

Algebra OCR6, OCR7

Content section	Description
Algebraic expressions	Simplifying algebraic expressions
	Factorise expressions including quadratic expressions
	Multiplying out brackets
	Completing the square
	Algebraic fractions
	Formulate algebraic expressions
	Rearranging formulae
	Substitute values into expressions
	Use of brackets
Algebraic formulae	Use kinematics formulae
Algebraic equations	Linear equations
	Solving inequalities
	Quadratic equations
	Approximate solutions by iteration
Algebraic inequalities	Graphical inequalities
Graphs of equations and functions	Features and types of graphs
	Trigonometric graphs
	Equations of circles
	Transformations of graphs
	Drawing and interpreting graphs
	Solution set for inequalities
	Distance/speed-time graphs
Straight line graphs	Parallel and perpendicular lines
	Equation of a line
Proof	Algebraic proofs

Geometry OCR8, OCR9, OCR10

Content section	Description
Conventions, notation and terms	Properties of a triangle
	Circle terms
Angles	Angles in polygons
	Angle properties of parallel lines
Similarity	Length, area and volume scale factors of similar figures
Units of measurement	Units of money, speed, distance, length, time, density, mass, volume and area.
Compound units	Rates
Plane isometric transformations	Transformations
Congruency	Reasons for congruency
Volume and surface area calculations	Volume and surface area including cuboid, prism, pyramid and sphere
Constructions and loci	Construct loci
	Maps, bearings and scale drawings
Circle geometry	Standard circle theorems
	Area and circumference of a circle and length of an arc
Area calculations	Area of a rectangle
	Area of a triangle
Triangle mensuration	Trigonometry
	Pythagoras' Theorem
	Exact trigonometric ratios
	Solving non-right-angled triangles

Probability OCR11

Content section	Description
Basic probability and experiments	Relative frequency
	Equally likely outcomes and probability
Combined events and probability diagrams	Enumeration
	Sample spaces
	Venn diagrams and sets
	Calculation with the laws of probability
	Conditional probability

Statistics OCR12

Content section	Description
Analysing Data	Graphical misrepresentation
Interpreting and representing data	Pie chart
	Collecting data
	Scatter diagrams and outliers
	Cumulative frequency
	Line graph and time series

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