

GCSE Mathematics Learning Journey



GCSE EXAMS:
 PAPER 1: NON-CALCULATOR (1 Hour 30 Minutes) PAPER 2: CALCULATOR (1 Hour 30 minutes) PAPER 3: CALCULATOR (1 Hour 30 Minutes)

Geometry 2
 Surface area: Prisms, cones and spheres
 Similar length, area and volume
 Congruence and proof
 Vector proof

Number Algebra 2
 Reciprocal and exponential graphs
 Transforming graphs
 Trig graphs
 Equations of circles
 Quadratic functions

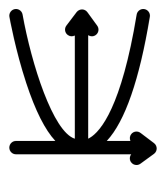
Geometry 1
 Geometrical proof
 Circle theorem proof
 Sine and cosine rules
 Area of non right angle triangles
 Segments
 Vectors

Algebra 1
 Completing the square
 Quadratic identities
 Quadratic Simultaneous equations
 Solving algebraic fractions
 Iteration
 Algebraic proof

Number 1
 Fractional indices
 Rationalising surds
 Degrees of accuracy
 Exponential growth and decay

PATHWAY 7

Statistics 1
 Quartiles raw data
 Cumulative frequency
 Histograms
 Set notation
 Venn diagrams and probability
 Conditional Probability



Statistics 1
 Product rule for counting
 Measures of spread and average
 Median, quartiles and box plots
 Probability trees, AND / OR Rules
 Set notation

PATHWAY 6

Number 1
 Rational Numbers
 Surds
 Standard form
 Changing bases
 Fractional Indices
 Recurring Decimals
 Accuracy in calculations

Algebra 1
 Expanding cubics
 Algebraic fractions
 Quadratic formula
 Deriving equations
 Solving simultaneous equations by substitution

Geometry 1
 Congruence and similarity
 Arcs and sectors
 Circle theorems
 3D trigonometry and Pythagoras

Number Algebra 2
 Graphing quadratics and cubics
 Roots
 Parallel and perpendicular lines
 Graphing Inequalities
 Proportional reasoning

Geometry 2
 Transformations
 Measures
 Volume: Prisms, cones and spheres
 Frustums and similarity
 Density, mass and volume

Geometry 2
 Drawing/Describing transformations
 Fractional and negative scale factor enlargement
 Compound measures
 Conversions of compound measures
 Cone/sphere volume
 Similar triangles
 Area and volume similarity

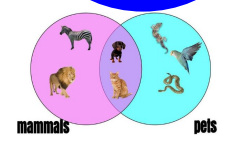
Number Algebra 2
 $Y=mx+c$, gradients, intercepts
 Rate of change graphs
 Proportional reasoning
 Direct/Inverse proportion
 Percentage change
 Compound and simple interest
 Problem solving with ratio
 Solving equations using ratio

Geometry 1
 Areas and perimeters of circles, arcs and sectors.
 Angles in parallel lines
 Calculating with bearings incorporating pythagoras theorem
 Trigonometry
 Surface area of all types of 3D shapes

Algebra 1
 Expanding & factorising complex quadratics
 Solve quadratic equations
 Algebraic fractions
 Graphing quadratics cubics
 Simultaneous equations

Number 1
 Reciprocals
 Calculating in standard form
 Recurring decimals and fractions
 Limits of accuracy
 Surds

PATHWAY 5

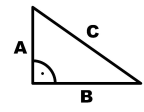


Statistics 1
 Averages from grouped data
 Charts with continuous data
 Scatter diagrams
 Probability from multiple events
 Probability trees
 Venn diagrams



Statistics 1
 Drawing/Interpreting graphs and charts
 Reverse averages
 Scatter graphs
 Probability as fractions, decimals and percentages
 Sample spaces, two way tables
 Venn diagrams and sets

PATHWAY 4



Number 1
 Indices, roots and reciprocals
 Decomposition to find HCF & LCM
 First 3 index laws
 Reading & writing standard form
 Calculating with standard form

Algebra 1
 Expanding & factorising quadratics
 Using and solving formulae
 Simultaneous equations
 Algebraic fractions
 Positive quadratic graphs
 Complex Sequences & nth term

Geometry 1
 Plans & elevations
 Loci
 Problem solving with circles
 Surface area of prisms
 Solving angles in parallel lines
 Pythagoras' Theorem

Number Algebra 2
 Inequalities
 Equations of horizontal & vertical lines
 Using $y=mx+c$
 Direct proportional reasoning
 Inverse proportional reasoning
 Reverse percentages

Geometry 2
 Rotational & line symmetry
 Column vectors
 Rotations
 Enlargement with fractional scale factors
 Metric measure conversions in area

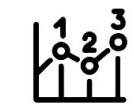
Geometry 2
 Drawing and Describing transformations
 Using conversion graphs
 Volume of prisms
 Linear Similarity

Number Algebra 2
 Manipulating fractions
 Calculating with fractions & mixed numbers
 Problem solving with ratio
 Manipulating fractions, decimals percentages and choosing appropriate format to solve problems.

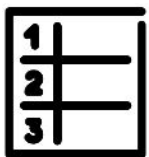
Geometry 1
 Angle properties including angles in parallel lines,
 Interior and Exterior Angles
 Surface area of prisms
 Area and Circumference of circles
 Congruence and Constructions

Algebra 1
 Manipulating algebraic expressions
 Solving Equations
 Sequences and nth term
 Writing and using complex expressions, formulae and Equations to represent real life and abstract concepts

Number 1
 Directed Number
 Relative Magnitude
 BIDMAS application
 Application of Factors, Multiples, Primes and Squares
 Rounding and Truncation



PATHWAY 3



Mathematics Learning Journey



Year 7 (Left Arrow) **Year 11** (Right Arrow)

Geometry 2
Surface area: Prisms, cones and spheres
Similar length, area and volume
Congruence and proof
Vector proof

Number Algebra 2
Reciprocal and exponential graphs
Transforming graphs
Trig graphs
Equations of circles
Quadratic functions

Geometry 1
Geometrical proof
Circle theorem proof
Sine and cosine rules
Area of non right angle triangles
Segments
Vectors

Algebra 1
Completing the square
Quadratic identities
Quadratic Simultaneous equations
Solving algebraic fractions
Iteration
Algebraic proof

Number 1
Fractional indices
Rationalising surds
Degrees of accuracy
Exponential growth and decay

Statistics 1
Quartiles raw data
Cumulative frequency
Histograms
Set notation
Venn diagrams and probability
Conditional Probability

Infinity Symbol

PATHWAY 6

Statistics 1
Product rule for counting
Measures of spread and average
Median, quartiles and box plots
Probability trees, AND / OR Rules
Set notation

Number 1
Rational Numbers
Surds
Standard form
Changing bases
Fractional Indices
Recurring Decimals
Accuracy in calculations

Algebra 1
Expanding cubics
Algebraic fractions
Quadratic formula
Deriving equations
Solving simultaneous equations by substitution

Geometry 1
Congruence and similarity
Arcs and sectors
Circle theorems
3D trigonometry and Pythagoras

Number Algebra 2
Graphing quadratics and cubics
Roots
Parallel and perpendicular lines
Graphing Inequalities
Proportional reasoning

Geometry 2
Transformations
Measures
Volume: Prisms, cones and spheres
Frustums and similarity
Density, mass and volume

Downward Arrow

PATHWAY 5

Geometry 2
Drawing/Describing transformations
Fractional and negative scale factor enlargement
Compound measures
Conversions of compound measures
Cone/sphere volume
Similar triangles
Area and volume similarity

Number Algebra 2
 $Y=mx+c$, gradients, intercepts
Rate of change graphs
Proportional reasoning
Direct/Inverse proportion
Percentage change
Compound and simple interest
Problem solving with ratio
Solving equations using ratio

Geometry 1
Areas and perimeters of circles, arcs and sectors.
Angles in parallel lines
Calculating with bearings incorporating pythagoras theorem
Trigonometry
Surface area of all types of 3D shapes

Algebra 1
Expanding & factorising complex quadratics
Solve quadratic equations
Algebraic fractions
Graphing quadratics cubics
Simultaneous equations

Number 1
Reciprocals
Calculating in standard form
Recurring decimals and fractions
Limits of accuracy
Surds

Statistics 1
Averages from grouped data
Charts with continuous data
Scatter diagrams
Probability from multiple events
Probability trees
Venn diagrams

Red Cone

PATHWAY 4

Statistics 1
Drawing/Interpreting graphs and charts
Reverse averages
Scatter graphs
Probability as fractions, decimals and percentages
Sample spaces, two way tables
Venn diagrams and sets

Number 1
Indices, roots and reciprocals
Decomposition to find HCF & LCM
First 3 index laws
Reading & writing standard form
Calculating with standard form

Algebra 1
Expanding & factorising quadratics
Using and solving formulae
Simultaneous equations
Algebraic fractions
Positive quadratic graphs
Complex Sequences & nth term

Geometry 1
Plans & elevations
Loci
Problem solving with circles
Surface area of prisms
Solving angles in parallel lines
Pythagoras' Theorem

Number Algebra 2
Inequalities
Equations of horizontal & vertical lines
Using $y=mx+c$
Direct proportional reasoning
Inverse proportional reasoning
Reverse percentages

Geometry 2
Rotational & line symmetry
Column vectors
Rotations
Enlargement with fractional scale factors
Metric measure conversions in area

Right Triangle

PATHWAY 3

Geometry 2
Drawing and Describing transformations
Using conversion graphs
Volume of prisms
Linear Similarity

Number Algebra 2
Manipulating fractions
Calculating with fractions & mixed numbers
Problem solving with ratio
Manipulating fractions, decimals percentages and choosing appropriate format to solve problems.

Geometry 1
Angle properties including angles in parallel lines, Interior and Exterior Angles
Surface area of prisms
Area and Circumference of circles
Congruence and Constructions

Algebra 1
Manipulating algebraic expressions
Solving Equations
Sequences and nth term
Writing and using complex expressions, formulae and Equations to represent real life and abstract concepts

Number 1
Directed Number
Relative Magnitude
BIDMAS application
Application of Factors, Multiples, Primes and Squares
Rounding and Truncation

Statistics 1
Using scales
Statistical terminology
Construct & interpret charts
Frequency tables & calculate averages
Probability scale

Grid

PATHWAY 2

Statistics 1
Averages from discrete data
Drawing charts & graphs
Interpreting from charts and graphs
Data Handling cycle

Number 1
Four Operations with decimals
Factors, multiples and primes
Rounding to given decimal places
Relative magnitude of large numbers
Time

Algebra 1
Directed number
Coordinates
BIDMAS
Manipulating algebraic expressions
Writing expressions
Sequences & nth term

Geometry 1
Perpendicular & angle notation
Finding missing angles in polygons
Properties of quadrilaterals & triangles
Circumference and area of circles
Surface area, area & perimeter

Number Algebra 2
Manipulating fractions
Calculating with fractions & mixed numbers
Finding percentages
Percentage increase and decrease
Using ratios
Sharing in given ratios

Geometry 2
Symmetry & Reflections
Translations
Rotations
Enlargement
Measures
Volume using cm cubes

180°

PATHWAY 1

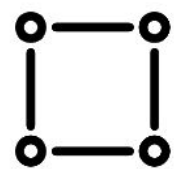
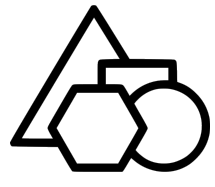
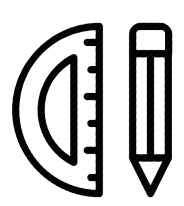
Geometry 2
Symmetry & Reflections
Translations
Rotations
Units of measurement conversions
Tessellation

Number Algebra 2
Writing & drawing fractions
Comparing fractions
Equivalent fractions
Simplifying fractions
Percentages
Converting from FDP

Geometry 1
Parallel & Perpendicular Lines
Angles and Angle notation
Quadrilaterals & triangles
Geometric notation
Area & perimeter

Algebra 1
Directed number
Coordinates
BIDMAS
Algebraic expressions
Sequences

Number 1
Place Value
Four Operations
Factors, multiples and primes
Integer rounding & Estimating
Numerals, relative magnitude
Time



KS3 Mathematics Learning Journey



END OF YEAR 9 EXAMS

Statistics 1
Product rule for counting
Measures of spread and average
Median, quartiles and box plots
Probability trees, AND / OR Rules
Set notation

Geometry 2
Drawing/Describing transformations
Fractional and negative scale factor enlargement
Compound measures
Conversions of compound measures
Cone/sphere volume
Similar triangles
Area and volume similarity

Number Algebra 2
 $Y=mx+c$, gradients, intercepts
Rate of change graphs
Proportional reasoning
Direct/Inverse proportion
Percentage change
Compound and simple interest
Problem solving with ratio
Solving equations using ratio

Geometry 1
Areas and perimeters of circles, arcs and sectors.
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Calculating with bearings incorporating pythagoras theorem
Trigonometry
Surface area of all types of 3D shapes

Algebra 1
Expanding & factorising complex quadratics
Solve quadratic equations
Algebraic fractions
Graphing quadratics cubics
Simultaneous equations

Number 1
Reciprocals
Calculating in standard form
Recurring decimals and fractions
Limits of accuracy
Surds

PATHWAY 5



Statistics 1
Averages from grouped data
Charts with continuous data
Scatter diagrams
Probability from multiple events
Probability trees
Venn diagrams

Geometry 2
Rotational & line symmetry
Column vectors
Rotations
Enlargement with fractional scale factors
Metric measure conversions in area



PATHWAY 4

Statistics 1
Drawing/Interpreting graphs and charts
Reverse averages
Scatter graphs
Probability as fractions, decimals and percentages
Sample spaces, two way tables
Venn diagrams and sets

Geometry 2
Drawing and Describing transformations
Using conversion graphs
Volume of prisms
Linear Similarity

Number Algebra 2
Manipulating fractions
Calculating with fractions & mixed numbers
Problem solving with ratio
Manipulating fractions, decimals percentages and choosing appropriate format to solve problems.

Geometry 1
Angle properties including angles in parallel lines, Interior and Exterior Angles
Surface area of prisms
Area and Circumference of circles
Congruence and Constructions

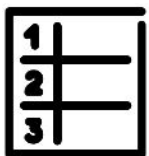
Algebra 1
Expanding & factorising quadratics
Using and solving formulae
Simultaneous equations
Algebraic fractions
Positive quadratic graphs
Complex Sequences & nth term

Geometry 1
Plans & elevations
Loci
Problem solving with circles
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Solving angles in parallel lines
Pythagoras' Theorem

Number Algebra 2
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Inverse proportional reasoning
Reverse percentages

Statistics 1
Using scales
Statistical terminology
Construct & interpret charts
Frequency tables & calculate averages
Probability scale

Geometry 2
Symmetry & Reflections
Translations
Rotations
Enlargement
Measures
Volume using cm cubes



PATHWAY 2

Statistics 1
Averages from discrete data
Drawing charts & graphs
Interpreting from charts and graphs
Data Handling cycle

Geometry 2
Symmetry & Reflections
Translations
Rotations
Units of measurement conversions
Tessellation

Number Algebra 2
Writing & drawing fractions
Comparing fractions
Equivalent fractions
Simplifying fractions
Percentages
Converting from FDP

Geometry 1
Parallel & Perpendicular Lines
Angles and Angle notation
Quadrilaterals & triangles
Geometric notation
Area & perimeter

Algebra 1
Directed number
Coordinates
BIDMAS
Manipulating algebraic expressions
Writing expressions
Sequences & nth term

Geometry 1
Perpendicular & angle notation
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Number Algebra 2
Manipulating fractions
Calculating with fractions & mixed numbers
Finding percentages
Percentage increase and decrease
Using ratios
Sharing in given ratios

Statistics 1
Place Value
Four Operations
Factors, multiples and primes
Integer rounding & Estimating
Numerals, relative magnitude
Time

PATHWAY 1

