Pearson Edexcel GCSE (9–1)

May–June 2022 Assessment Window

Syllabus reference **1MA1**

Mathematics

Advance Information
Version 2

You are not permitted to take this notice into the examination.
This document is valid if downloaded from the Pearson Qualifications website.

Instructions

- Please ensure that you have read this notice before the examination.

Information

- This notice covers all examined components.
- The format/structure of the assessments remains unchanged.
- The Advance Information details the focus of the content of the exams in the May–June 2022 assessments.
- There are no restrictions on who can use this notice.
- This notice is meant to help students to focus their revision time.
- Students and teachers can discuss the advance information.
- This document has 25 pages.

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General advice

- In addition to covering the content outlined in the advance information, students and teachers should consider how to:
  - manage their revision of parts of the specification which may be assessed in areas not covered by the advance information
  - manage their revision of other parts of the specification which may provide knowledge which helps with understanding the areas being tested in 2022.
- For specifications with synoptic assessments, topics not explicitly given in the advance information may appear, e.g. where students are asked to bring together knowledge, skills and understanding from across the specification.
- For specifications with optional papers/topics/content, students should only refer to the advance information for their intended option.
- For specifications with NEA, advance information does not cover any NEA components.

A link to the Joint Council for Qualifications guidance document on advance information can be found on the Joint Council for Qualifications website or here.

Advance Information

Subject specific section

- Advance information will be provided for each paper and for each tier of entry.
- The information is presented in approximate specification order and does not reflect the order of the questions.
- Questions may be answerable using one or more of the indicated areas of specification content.
- The areas of content listed are suggested as key areas of focus for revision and final preparation, in relation to the May–June 2022 examinations.
- The aim should still be to cover all specification content in teaching and learning.
- Students may need to draw on prior knowledge and skills.
- Students will still be expected to apply their knowledge to unfamiliar contexts.
- Students responses to questions may draw upon knowledge, skills and understanding from across the content listed when responding to questions.
- Students will be credited for using any relevant knowledge from any other topic areas when answering questions.

Exam Aid

- A formula sheet will be provided for foundation tier and higher tier students.

Paper 1F – grouped by content area

Number (*see Ratio – some overlap of topic areas)	
Arithmetic	Money
	Negative number
Fractions	Order fractions, decimals, percentages
	Fraction of an amount
	Fraction arithmetic
Properties	Place value
	Product of prime factors
Standard Form	Conversion
	Calculation
Approximation and Estimation	Estimation
Algebra	
Manipulation	Simplification
	Substitute values
Equations and inequalities	Linear inequality
	Quadratic equation
Graphs	Quadratic graph
Sequences	Linear sequence
Ratio, proportion, and rates of change (*see Number – some overlap of topic areas)	
Conversion	Length
Percentages	Percentage of an amount
	Percentage increase
Ratio	Write as a ratio
	Share in a ratio
Proportion	Direct proportion

Compound Measures	Speed
	Density
Geometry and measures	
Shape	Reflection
	Plan and elevation
Angles	Angles in a polygon
Length, area and volume	Volume of a cube
	Volume of a cylinder
Pythagoras's Theorem and Trigonometry	Exact trigonometric values
Probability	
Probability	Probability
	Frequency tree
Statistics	
Diagrams	Pictogram
	Bar chart
	Stem and leaf diagram

Paper 2F – grouped by content area

Number (*see Ratio – some overlap of topic areas)	
Arithmetic	Money
	Negative number
Fractions	Fraction arithmetic
	Order fractions
Properties	Order integers
	Multiples
Approximation and Estimation	Rounding
	Error interval
Other	Mathematical symbols
Algebra	
Manipulation	Simplification
	Expansion of bracket
	Factorisation
	Laws of indices
Equations and inequalities	Linear simultaneous equations
Graphs	Coordinates
	Straight line graph
Functions	Number machines
Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Conversions	Mass, time, area
	Scale drawing
Percentages	Decimal to percentage
	Percentage profit
	Depreciation

Ratio	Write as a ratio
	Use of ratio
Proportion	Direct proportion
	Currency conversion
Geometry and measures	
Shape	Polygons
	Circles
	Parallel and perpendicular lines
	Transformations
Angles	Angles in a triangle
	Vertically opposite angles
Length, area and volume	Area of a rectangle
Probability	
Probability	Tree diagram
	Combined events
Statistics	
Diagrams	Interpret graph
	Two-way table
	Frequency table
Measures	Mode
	Median
	Mean

Paper 3F – grouped by content area

Number (*see Ratio – some overlap of topic areas)	
Arithmetic	Four operations
	Negative number
Fractions	Fraction of an amount
	One amount as a fraction of another
	Equivalent fractions
Properties	Factors
	Lowest Common Multiple
Powers and roots	Square root
Approximation and estimation	Rounding
Other	Calculator use
Algebra	
Manipulation	Simplification
	Expansion of bracket
	Factorisation
	Substitute values
	Change subject of a formula
	Forming an expression
Equations and inequalities	Linear equation
	Form an equation
Sequences	Linear sequence
Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Conversions	Time
	Compound units
	Scale drawing

Percentages	Percentage to fraction
	One quantity as a percentage of another
	Percentage decrease
	Reverse percentage
Ratio	Write as a ratio
	1 : *n* form
Proportion	Direct proportion
Compound measures	Average speed
Geometry and measures	
Shape	Triangle properties
	Quadrilaterals
	Triangular prism
Angles	Angle properties of parallel lines
	Angles in a triangle
	Vertically opposite angles
	Bearings
Length, area and volume	Area of a triangle
	Area of a trapezium
Pythagoras's Theorem and Trigonometry	Pythagoras's Theorem
Probability	
Probability	Probability scale
	Probability
Statistics	
Diagrams	Frequency polygon
Measures	Median
	Range
Population	Comparison of distributions

Paper 1H – grouped by content area

Number (*see Ratio – some overlap of topic areas)	
Fractions	Fraction of an amount
	Fraction arithmetic
	Recurring decimal to fraction
Properties	Product of prime factors
	Negative and fractional indices
Powers and roots	Simplification of surds
Standard Form	Conversion
	Calculation
Algebra	
Manipulation	Simplification
	Expansion of brackets
	Algebraic fractions
Equations and inequalities	Linear inequality
	Form an equation
	Quadratic equation
	Equation of a tangent to a circle
Graphs	Quadratic graph
	Speed-time graph
	Gradients of parallel and perpendicular lines
	Gradient of a curve

Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Percentages	Percentage of an amount
Ratio	Write as a ratio
	Use of ratio
	Share in a ratio
	Ratio to fraction
Proportion	Equations of proportion
Compound Measures	Density
Geometry and measures	
Angles	Angles in a polygon
Length, area and volume	Area of a triangle
	Volume of a cube
	Surface area of a cuboid
	Area of a sector
Pythagoras's Theorem and Trigonometry	Pythagoras's Theorem
	Exact trigonometric values
Vectors	Vector geometry
Probability	
Probability	Probability
	Independent combined events
Statistics	
Diagrams	Cumulative frequency graph
Measures	Mean
	Inter-quartile range

Paper 2H – grouped by content area

Number (*see Ratio – some overlap of topic areas)	
Approximation and estimation	Error interval
Other	Use of a calculator
Algebra	
Manipulation	Simplification
	Expansion of bracket
	Factorisation
	Laws of indices
Equations and inequalities	Linear equation
	Equations of parallel lines
	Form an equation
	Quadratic inequality
Graphs	Coordinates
	Transformations of functions
	Graphs of trigonometric functions
Functions	Inverse and composite functions
Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Conversions	Area
Percentages	Depreciation
Ratio	Use of ratio
Proportion	Direct proportion
	Currency conversion
	Inverse proportion
Compound measures	Pressure

Geometry and measures	
Shape	Transformations
Angles	Circle theorems
Length, area and volume	Area of a rectangle
	Volume of composite solid
Pythagoras's Theorem and Trigonometry	Sine and Cosine Rules
Probability	
Probability	Venn diagram
	Probability from a Venn diagram
Statistics	
Diagrams	Box plot
Measures	Lower and upper quartiles
Populations	Compare distributions
	Capture-recapture method

Paper 3H – grouped by content area

Number (*see Ratio – some overlap of topic areas)	
Arithmetic	Negative number
Properties	Laws of indices
Approximation and estimation	Bounds
Other	Product rule for counting
Algebra	
Manipulation	Simplification
	Expansion of bracket
	Substitute values
	Difference of two squares
	Expansion of brackets
	Change subject of a formula
	Forming an expression
	Algebraic fractions
Equations and inequalities	Set up and solve equation
	Simultaneous equations linear/quadratic
Graphs	Gradient of a straight line graph
Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Conversions	Time
Percentages	Percentage decrease
	Depreciation
	Reverse percentage

Ratio	Write as a ratio
	1 : *n* form
	Share in a ratio
Proportion	Direct proportion
Compound Measures	Average speed
Growth and decay	General iterative processes
Geometry and measures	
Angles	Circle theorems
Length, area and volume	Area of a trapezium
	Similar triangles
Pythagoras's Theorem and Trigonometry	Pythagoras's Theorem
	Trigonometry
	Trigonometry in 3-D
Vectors	Column vectors
Probability	
Probability	Dependent combined events
Statistics	
Diagrams	Frequency polygon
	Histogram

Foundation Tier: Collated content for Paper 1F, 2F and 3F

Number (*see Ratio – some overlap of topic areas)	
Arithmetic	Money
	Four operations
	Negative number
Fractions	Order fractions, decimals, percentages
	Fraction of an amount
	One amount as a fraction of another
	Fraction arithmetic
	Equivalent fractions
Properties	Place value
	Order integers
	Multiples
	Factors
	Lowest Common Multiple
	Product of prime factors
Powers and roots	Square root
Standard Form	Conversion
	Calculation
Approximation and estimation	Rounding
	Estimation
	Error interval
Other	Mathematical symbols
	Calculator use

Algebra	
Manipulation	Simplification
	Expansion of bracket
	Factorisation
	Substitute values
	Change subject of a formula
	Forming an expression
	Laws of indices
Equations and inequalities	Linear equation
	Linear inequality
	Linear simultaneous equations
	Form an equation
	Quadratic equation
Graphs	Coordinates
	Straight line graph
	Quadratic graph
Functions	Number machines
Sequences	Linear sequence
Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Conversion	Length, mass, time, area
	Compound units
	Scale drawing

Percentages	Percentage to fraction
	Decimal to percentage
	Percentage of an amount
	Percentage increase/decrease
	Percentage profit
	One quantity as a percentage of another
	Depreciation
	Reverse percentage
Ratio	Write as a ratio
	Share in a ratio
	Use of ratio
	1 : *n* form
Proportion	Direct proportion
	Currency conversion
Compound Measures	Speed
	Average speed
	Density
Geometry and measures	
Shape	Triangle properties
	Quadrilaterals
	Polygons
	Triangular prism
	Circles
	Parallel and perpendicular lines
	Reflection
	Transformations
	Plan and elevation

Angles	Angles in a triangle
	Vertically opposite angles
	Angle properties of parallel lines
	Angles in a polygon
	Bearings
Length, area and volume	Area of a rectangle
	Area of a triangle
	Area of a trapezium
	Volume of a cube
	Volume of a cylinder
Pythagoras's Theorem and Trigonometry	Pythagoras's Theorem
	Exact trigonometric values
Probability	
Probability	Probability scale
	Probability
	Frequency tree
	Tree diagram
	Combined events
Statistics	
Diagrams	Pictogram
	Bar chart
	Interpret graph
	Two-way table
	Frequency table
	Stem and leaf diagram
	Frequency polygon
Measures	Mode, median, mean, range
Population	Comparison of distributions

Higher Tier: Collated content for Paper 1H, 2H and 3H

Number (*see Ratio – some overlap of topic areas)	
Arithmetic	Negative number
Fractions	Fraction of an amount
	Fraction arithmetic
	Recurring decimal to fraction
Properties	Product of prime factors
	Laws of indices
	Negative and fractional indices
Powers and roots	Simplification of surds
Standard Form	Conversion
	Calculation
Approximation and estimation	Error Interval
	Bounds
Other	Use of a calculator
	Product rule for counting
Algebra	
Manipulation	Simplification
	Expansion of bracket
	Factorisation
	Laws of indices
	Substitute values
	Change subject of a formula
	Forming an expression
	Expansion of brackets
	Difference of two squares
	Algebraic fractions

Equations and inequalities	Linear equation
	Form an equation
	Set up and solve equation
	Linear inequality
	Quadratic equation
	Quadratic inequality
	Equations of parallel lines
	Equation of a tangent to a circle
	Simultaneous equations linear/quadratic
Graphs	Coordinates
	Quadratic graph
	Gradient of a straight line graph
	Gradients of parallel and perpendicular lines
	Speed-time graph
	Gradient of a curve
	Transformations of functions
	Graphs of trigonometric functions
Functions	Inverse and composite functions
Ratio, proportion and rates of change (*see Number – some overlap of topic areas)	
Conversions	Time
	Area
Percentages	Percentage of an amount
	Percentage decrease
	Depreciation
	Reverse percentage

Ratio	Write as a ratio
	Use of ratio
	1 : *n* form
	Share in a ratio
	Ratio to fraction
Proportion	Direct proportion
	Currency conversion
	Inverse proportion
	Equations of proportion
Compound Measures	Average speed
	Density
	Pressure
Growth and decay	General iterative processes
Geometry and measures	
Shape	Transformations
Angles	Angles in a polygon
	Circle theorems
Length, area and volume	Area of a rectangle
	Area of a triangle
	Area of a trapezium
	Area of a sector
	Surface area of a cuboid
	Volume of a cube
	Volume of composite solid
	Similar triangles

Pythagoras's Theorem and Trigonometry	Pythagoras's Theorem
	Trigonometry
	Sine and Cosine Rules
	Trigonometry in 3-D
	Exact trigonometric values
Vectors	Column vectors
	Vector geometry
Probability	
Probability	Probability
	Venn diagram
	Probability from a Venn diagram
	Independent combined events
	Dependent combined events
Statistics	
Diagrams	Frequency polygon
	Cumulative frequency graph
	Box plot
	Histogram
Measures	Mean
	Lower and upper quartiles
	Inter-quartile range
Populations	Compare distributions
	Capture-recapture method

Foundation Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

Area of a trapezium = $\frac{1}{2}(a + b)\,h$

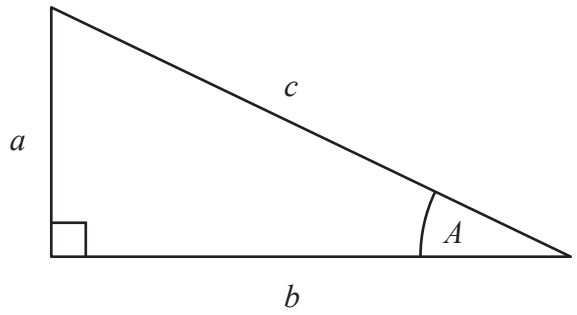
Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

Area of a circle = πr^2

Pythagoras' Theorem and Trigonometry



In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$a^2 + b^2 = c^2$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued = $P\left(1 + \frac{r}{100}\right)^n$

Probability

Where P (A) is the probability of outcome A and P (B) is the probability of outcome B:

P (A or B) = P (A) + P (B) – P (A and B)

Higher Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

Area of a trapezium = $\frac{1}{2}(a + b)\,h$

Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

Area of a circle = πr^2

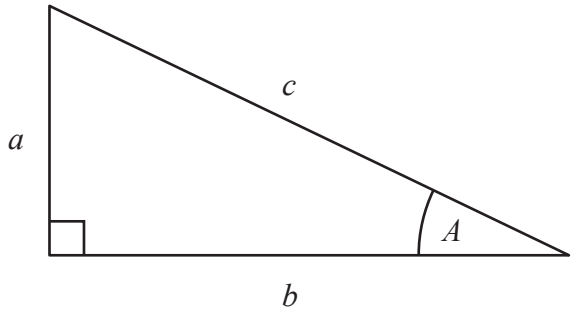
Quadratic formula

The solution of $ax^2 + bx + c = 0$

where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

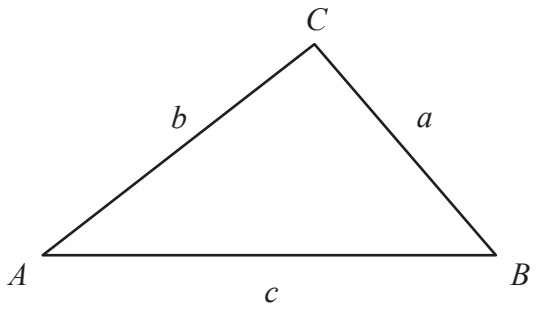


In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$a^2 + b^2 = c^2$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a, b and c are the length of the sides:

sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}\,a\,b \sin C$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued = $P\left(1 + \frac{r}{100}\right)^n$

Probability

Where P (A) is the probability of outcome A and P (B) is the probability of outcome B:

P (A or B) = P (A) + P (B) – P (A and B)

P (A and B) = P (A given B) P(B)

END OF ADVANCE INFORMATION