CAMBRIDGE
International Examinations

Cambridge
IGCSE

SYLLABUS

Cambridge IGCSE®
International Mathematics
0607

For examination in June and November 2015

Cambridge Secondary 2

Changes to syllabus for 2015

This syllabus has been updated, but there are no significant changes.

Contents

1. Introduction

1.1 Why choose Cambridge?

Recognition

Cambridge International Examinations is the world's largest provider of international education programmes and qualifications for learners aged 5 to 19. We are part of Cambridge Assessment, a department of the University of Cambridge, trusted for excellence in education. Our qualifications are recognised by the world's universities and employers.

Cambridge IGCSE® (International General Certificate of Secondary Education) is internationally recognised by schools, universities and employers as equivalent in demand to UK GCSEs. Learn more at **www.cie.org.uk/recognition**

Excellence in education

Our mission is to deliver world-class international education through the provision of high-quality curricula, assessment and services.

More than 9000 schools are part of our Cambridge learning community. We support teachers in over 160 countries who offer their learners an international education based on our curricula and leading to our qualifications. Every year, thousands of learners use Cambridge qualifications to gain places at universities around the world.

Our syllabuses are reviewed and updated regularly so that they reflect the latest thinking of international experts and practitioners and take account of the different national contexts in which they are taught.

Cambridge programmes and qualifications are designed to support learners in becoming:

- **confident** in working with information and ideas – their own and those of others
- **responsible** for themselves, responsive to and respectful of others
- **reflective** as learners, developing their ability to learn
- **innovative** and equipped for new and future challenges
- **engaged** intellectually and socially, ready to make a difference.

Support for teachers

A wide range of materials and resources is available to support teachers and learners in Cambridge schools. Resources suit a variety of teaching methods in different international contexts. Through subject discussion forums and training, teachers can access the expert advice they need for teaching our qualifications. More details can be found in Section 2 of this syllabus and at **www.cie.org.uk/teachers**

Support for exams officers

Exams officers can trust in reliable, efficient administration of exams entries and excellent personal support from our customer services. Learn more at **www.cie.org.uk/examsofficers**

Not-for-profit, part of the University of Cambridge

We are a not-for-profit organisation where the needs of the teachers and learners are at the core of what we do. We continually invest in educational research and respond to feedback from our customers in order to improve our qualifications, products and services.

Our systems for managing the provision of international qualifications and education programmes for learners aged 5 to 19 are certified as meeting the internationally recognised standard for quality management, ISO 9001:2008. Learn more at **www.cie.org.uk/ISO9001**

1.2 Why choose Cambridge IGCSE?

Cambridge IGCSEs are international in outlook, but retain a local relevance. The syllabuses provide opportunities for contextualised learning and the content has been created to suit a wide variety of schools, avoid cultural bias and develop essential lifelong skills, including creative thinking and problem-solving.

Our aim is to balance knowledge, understanding and skills in our programmes and qualifications to enable candidates to become effective learners and to provide a solid foundation for their continuing educational journey.

Through our professional development courses and our support materials for Cambridge IGCSEs, we provide the tools to enable teachers to prepare learners to the best of their ability and work with us in the pursuit of excellence in education.

Cambridge IGCSEs are considered to be an excellent preparation for Cambridge International AS and A Levels, the Cambridge AICE (Advanced International Certificate of Education) Group Award, Cambridge Pre-U, and other education programmes, such as the US Advanced Placement program and the International Baccalaureate Diploma programme. Learn more about Cambridge IGCSEs at **www.cie.org.uk/cambridgesecondary2**

Guided learning hours

Cambridge IGCSE syllabuses are designed on the assumption that candidates have about 130 guided learning hours per subject over the duration of the course, but this is for guidance only. The number of hours required to gain the qualification may vary according to local curricular practice and the learners' prior experience of the subject.

1.3 Why choose Cambridge IGCSE International Mathematics?

Mathematics teachers in international schools have worked with Cambridge to create Cambridge International Mathematics (IGCSE) – a new curriculum and qualification to prepare students to use the power of mathematics in an increasingly technological world. The new syllabus fits teaching maths in an international school, leading to a qualification with widespread university recognition.

Prior learning

We recommend that candidates who are beginning this course should have previously studied an appropriate lower secondary mathematics programme.

Progression

Cambridge IGCSE Certificates are general qualifications that enable candidates to progress either directly to employment, or to proceed to further qualifications.

Candidates who are awarded grades C to A* in Cambridge IGCSE International Mathematics are well prepared to follow courses leading to Cambridge International AS and A Level Mathematics, or the equivalent.

1.4 Cambridge International Certificate of Education (ICE)

Cambridge ICE is a group award for Cambridge IGCSE. It gives schools the opportunity to benefit from offering a broad and balanced curriculum by recognising the achievements of learners who pass examinations in at least seven subjects. To qualify for the Cambridge ICE award learners are required to have studied subjects from five groups: two languages from Group I, and one subject from each of the remaining four groups. The seventh subject can be taken from any of the five subject groups.

Cambridge International Mathematics (0607) is in Group IV, Mathematics.

Learn more about Cambridge ICE at **www.cie.org.uk/cambridgesecondary2**

The Cambridge ICE is awarded from examinations administered in the June and November series each year.

Detailed timetables are available from **www.cie.org.uk/examsofficers**

1.5 How can I find out more?

If you are already a Cambridge school

You can make entries for this qualification through your usual channels. If you have any questions, please contact us at **info@cie.org.uk**

If you are not yet a Cambridge school

Learn about the benefits of becoming a Cambridge school at **www.cie.org.uk/startcambridge**. Email us at **info@cie.org.uk** to find out how your organisation can register to become a Cambridge school.

2. Teacher support

2.1 Support materials

Cambridge syllabuses, past question papers and examiner reports to cover the last examination series are on the *Syllabus and Support Materials* DVD, which we send to all Cambridge schools.

You can also go to our public website at **www.cie.org.uk/igcse** to download current and future syllabuses together with specimen papers or past question papers and examiner reports from one series.

For teachers at registered Cambridge schools a range of additional support materials for specific syllabuses is available online. For Teacher Support go to **http://teachers.cie.org.uk** (username and password required).

2.2 Resource lists

We work with publishers providing a range of resources for our syllabuses including textbooks, websites, CDs etc. Any endorsed, recommended and suggested resources are listed on both our public website and on Teacher Support.

The resource lists can be filtered to show all resources or just those which are endorsed or recommended by Cambridge. Resources endorsed by Cambridge go through a detailed quality assurance process and are written to align closely with the Cambridge syllabus they support.

2.3 Training

We offer a range of support activities for teachers to ensure they have the relevant knowledge and skills to deliver our qualifications. See **www.cie.org.uk/events** for further information.

3. Assessment at a glance

Candidates may follow either the Core Curriculum or the Extended Curriculum. Candidates should attempt to answer all questions on each paper. All papers must be taken in the same examination series at the end of the course.

Core curriculum Grades available C–G	Extended curriculum Grades available A*–E
Paper 1 **45 minutes** Short response questions. No calculators are permitted. Designed to assess knowledge and use of basic skills and methods. Any part of the syllabus content may be present in this paper but questions will focus on concepts which can be assessed without access to a calculator. **40 marks: 25% of assessment**	**Paper 2** **45 minutes** Short response questions. No calculators are permitted. Designed to assess knowledge and use of basic skills and methods. Any part of the syllabus content may be present in this paper but questions will focus on concepts which can be assessed without access to a calculator. **40 marks: 20% of assessment**
Paper 3 **1 hour 45 minutes** 11–15 medium to extended response questions. A graphics calculator is required. Any area of the syllabus may be assessed. Some of the questions will particularly assess the use of the graphics calculator functions described on Page 9. **96 marks: 60% of assessment**	**Paper 4** **2 hours 15 minutes** 11–15 medium to extended response questions. A graphics calculator is required. Any area of the syllabus may be assessed. Some of the questions will particularly assess the use of the graphics calculator functions described on Page 9. **120 marks: 60% of assessment**
Paper 5 **1 hour** One investigation question. A graphics calculator is required. Any area of the syllabus may be assessed. Candidates are assessed on their ability to investigate and solve a more open-ended problem. Clear communication and full reasoning are especially important and mark schemes reflect this. An extended time allowance is given for this paper to allow students to explore and communicate their ideas fully. **24 marks: 15% of assessment**	**Paper 6** **1 hour 30 minutes** One investigation and one modelling question. A graphics calculator is required. Any area of the syllabus may be assessed. Candidates are assessed on their ability to investigate, model, and solve more open-ended problems. Clear communication and full reasoning are especially important and mark schemes reflect this. An extended time allowance is given for this paper to allow students to explore and communicate their ideas fully. **40 marks: 20% of assessment**
Total marks: 160 marks: 100% of assessment	**Total marks: 200 marks: 100% of assessment**

3.1 Formula lists

Some mathematical formulae will be provided at the start of Papers 1–4.

These Core and Extended formula lists are given in the Appendix of this booklet.

Availability

This syllabus is examined in the May/June examination series and the October/November examination series.

Detailed timetables are available from **www.cie.org.uk/examsofficers**

This syllabus is available to private candidates.

Centres in the UK that receive government funding are advised to consult the Cambridge website **www.cie.org.uk** for the latest information before beginning to teach this syllabus.

Combining this with other syllabuses

Candidates can combine this syllabus in an examination series with any other Cambridge syllabus, except:

- syllabuses with the same title (or the title Mathematics) at the same level

Please note that Cambridge IGCSE, Cambridge International Level 1/Level 2 Certificate and Cambridge O Level syllabuses are at the same level.

4. Syllabus aims and assessment objectives

4.1 Syllabus aims

Cambridge International Mathematics (IGCSE) syllabus is designed as a two-year course for examination at age 16-plus. The aims of this syllabus should enable students to:

1. acquire a foundation of mathematical skills appropriate to further study and continued learning in mathematics;
2. develop a foundation of mathematical skills and apply them to other subjects and to the real world;
3. develop methods of problem solving;
4. interpret mathematical results and understand their significance;
5. develop patience and persistence in solving problems;
6. develop a positive attitude towards mathematics which encourages enjoyment, fosters confidence and promotes enquiry and further learning;
7. appreciate the beauty and power of mathematics;
8. appreciate the difference between mathematical proof and pattern spotting;
9. appreciate the interdependence of different branches of mathematics and the links with other disciplines;
10. appreciate the international aspect of mathematics, its cultural and historical significance and its role in the real world;
11. read mathematics and communicate the subject in a variety of ways.

4.2 Assessment objectives

The examination will test the ability of candidates to:

1. know and apply concepts from all the aspects of mathematics listed in the specification;
2. apply combinations of mathematical skills and techniques to solve a problem;
3. solve a problem by investigation, analysis, the use of deductive skills and the application of an appropriate strategy;
4. recognise patterns and structures and so form generalisations;
5. draw logical conclusions from information and understand the significance of mathematical or statistical results;
6. use spatial relationships in solving problems;
7. use the concepts of mathematical modelling to describe a real-life situation and draw conclusions;
8. organise, interpret and present information in written, tabular, graphical and diagrammatic forms;
9. use statistical techniques to explore relationships in the real world;
10. communicate mathematical work using the correct mathematical notation and terminology, logical argument, diagrams and graphs;
11. make effective use of technology;
12. estimate and work to appropriate degrees of accuracy.

4.3 Graphics calculator requirements

Candidates should be able to do the following using a graphics calculator.

- Sketch a graph.
- Produce a table of values for a function.
- Find zeros and local maxima or minima of a function.
- Find the intersection point of two graphs.
- Find mean, median, quartiles.
- Find the linear regression equation.

Other existing in-built applications should not be used and will gain no credit.

Calculators with symbolic algebraic logic are not permitted.

Any other applications and programs from external sources are not permitted.

4.4 Problem-solving requirements

Candidates should be able to:

- select the mathematics and information to model a situation;
- select the appropriate tools, including ICT, to use in a situation;
- apply appropriate methods and techniques to analyse a situation;
- interpret and communicate the results of the analysis.

5. Syllabus content (core and extended)

Candidates may follow either the Core Curriculum or the Extended Curriculum.

1	Number – Core curriculum	Notes	Link within syllabus
1.1	Vocabulary and notation for different sets of numbers: natural numbers $\mathbb{N}$, primes, squares, cubes, integers $\mathbb{Z}$, rational numbers $\mathbb{Q}$, irrational numbers, real numbers $\mathbb{R}$, triangle numbers	$\mathbb{N} = \{0, 1, 2, \ldots\}$	
1.2	Use of the four operations and brackets		
1.3	Highest common factor, lowest common multiple		
1.4	Calculation of powers and roots		
1.5	Ratio and proportion	including use of e.g. map scales	4.5
1.6			
1.7	Equivalences between decimals, fractions, ratios and percentages		
1.8	Percentages including applications such as interest and profit	excluding reverse percentages includes both simple and compound interest	
1.9	Meaning of exponents (powers, indices) in $\mathbb{Z}$ Standard Form $a \times 10^n$ where $1 \leq a < 10$ and $n \in \mathbb{Z}$ Rules for exponents		
1.10			
1.11	Estimating, rounding, decimal places and significant figures		
1.12	Calculations involving time: second (s), minutes (min), hours (h), days, months, years including the relation between consecutive units	1 year = 365 days	
1.13	Problems involving speed, distance and time problems		

1	Number – Extended curriculum	Notes	Link within syllabus
1.1	Vocabulary and notation for different sets of numbers: natural numbers $\mathbb{N}$, primes, squares, cubes, integers $\mathbb{Z}$, rational numbers $\mathbb{Q}$, irrational numbers, real numbers $\mathbb{R}$, triangle numbers	$\mathbb{N} = \{0, 1, 2, \ldots\}$	
1.2	Use of the four operations and brackets		
1.3	Highest common factor, lowest common multiple		
1.4	Calculation of powers and roots		
1.5	Ratio and proportion	including use of e.g. map scales	4.5
1.6	Absolute value $\lvert x \rvert$		
1.7	Equivalences between decimals, fractions, ratios and percentages		
1.8	Percentages including applications such as interest and profit	includes both simple and compound interest includes percentiles	3.2 11.7
1.9	Meaning of exponents (powers, indices) in $\mathbb{Q}$ Standard Form $a \times 10^n$ where $1 \leq a < 10$ and $n \in \mathbb{Z}$ Rules for exponents		
1.10	Surds (radicals), simplification of square root expressions Rationalisation of the denominator	e.g. $\frac{1}{\sqrt{3}-1}$	
1.11	Estimating, rounding, decimal places and significant figures		
1.12	Calculations involving time: second (s), minutes (min), hours (h), days, months, years including the relation between consecutive units	1 year = 365 days	
1.13	Problems involving speed, distance and time problems		

2	Algebra – Core curriculum	Notes	Link within syllabus
2.1	Writing, showing and interpretation of inequalities, including those on the real number line		9.2
2.2	Solution of simple linear inequalities		
2.3	Solution of linear equations		
2.4	Simple indices – multiplying and dividing	e.g. $8x^5 \div 2x^3$	
2.5	Derivation, rearrangement and evaluation of simple formulae		
2.6	Solution of simultaneous linear equations in two variables		
2.7	Expansion of brackets	including e.g. $(x - 5)(2x + 1)$	
2.8	Factorisation: common factor only	e.g. $6x^2 + 9x = 3x(2x + 3)$	
2.9	Algebraic fractions: simplification addition or subtraction of fractions with integer denominators multiplication or division of two simple fractions	e.g. $\frac{2x^2}{6x}$ e.g. $\frac{2x}{3} - \frac{y}{5}$ e.g. $\frac{p}{q} \div \frac{2t}{3q}$	
2.10			
2.11	Use of a graphics calculator to solve equations, including those which may be unfamiliar	e.g. $2^x = x^2$	3.6
2.12	Continuation of a sequence of numbers or patterns Determination of the *n*th term Use of a difference method to find the formula for a linear sequence or a simple quadratic sequence		
2.13			

2	Algebra – Extended curriculum	Notes	Link within syllabus
2.1	Writing, showing and interpretation of inequalities, including those on the real number line		9.2
2.2	Solution of linear and quadratic inequalities Solution of inequalities using a graphics calculator	e.g. $2x^2 + 5x - 3 < 0$	
2.3	Solution of linear equations including those with fractional expressions		
2.4	Indices		
2.5	Derivation, rearrangement and evaluation of formulae		
2.6	Solution of simultaneous linear equations in two variables		
2.7	Expansion of brackets, including the square of a binomial		
2.8	Factorisation: common factor difference of squares trinomial four term	e.g. $6x^2 + 9x = 3x(2x + 3)$ e.g. $9x^2 - 16y^2 = (3x - 4y)(3x + 4y)$ e.g. $6x^2 + 11x - 10 = (3x - 2)(2x + 5)$ e.g. $xy - 3x + 2y - 6 = (x + 2)(y - 3)$	
2.9	Algebraic fractions: simplification, including use of factorisation addition or subtraction of fractions with linear denominators multiplication or division and simplification of two fractions		
2.10	Solution of quadratic equations: by factorisation using a graphics calculator using the quadratic formula	formula given	3.6
2.11	Use of a graphics calculator to solve equations, including those which may be unfamiliar	e.g. $2x - 1 = 1/x^3$	3.6
2.12	Continuation of a sequence of numbers or patterns Determination of the nth term Use of a difference method to find the formula for a linear sequence, a quadratic sequence or a cubic sequence Identification of a simple geometric sequence and determination of its formula		
2.13	Direct variation (proportion) $y \propto x$, $y \propto x^2$, $y \propto x^3$, $y \propto \sqrt{x}$ Inverse variation $y \propto 1/x$, $y \propto 1/x^2$, $y \propto 1/\sqrt{x}$ Best variation model for given data		modelling

3	Functions – Core curriculum	Notes	Link within syllabus
3.1	Notation Domain and range Mapping diagrams	domain is $\mathbb{R}$ unless stated otherwise	
3.2			
3.3			
3.4			
3.5	Understanding of the concept of asymptotes and graphical identification of simple examples parallel to the axes		
3.6	Use of a graphics calculator to: sketch the graph of a function produce a table of values find zeros, local maxima or minima find the intersection of the graphs of functions	including unfamiliar functions not mentioned explicitly in this syllabus vertex of quadratic	2.11
3.7			
3.8	Description and identification, using the language of transformations, of the changes to the graph of $y = f(x)$ when $y = f(x) + k$, $y = f(x + k)$	k an integer	5.4
3.9			
3.10			

3	Functions – Extended curriculum	Notes	Link within syllabus
3.1	Notation Domain and range Mapping diagrams	 domain is $\mathbb{R}$ unless stated otherwise	
3.2	Recognition of the following function types from the shape of their graphs: linear $f(x) = ax + b$ quadratic $f(x) = ax^2 + bx + c$ cubic $f(x) = ax^3 + bx^2 + cx + d$ reciprocal $f(x) = a/x$ exponential $f(x) = a^x$ with $0 < a < 1$ or $a > 1$ absolute value $f(x) = \lvert ax + b \rvert$ trigonometric $f(x) = a\sin(bx)$; $a\cos(bx)$; $\tan x$	some of a, b, c or d may be 0 compound interest including period and amplitude	modelling 7.6 7.8 1.8 8.8
3.3	Determination of at most two of a, b, c or d in simple cases of 3.2		modelling
3.4	Finding the quadratic function given vertex and another point, x-intercepts and a point, vertex or x-intercepts with $a = 1$.	 $y = a(x - h)^2 + k$ has a vertex of (h, k)	
3.5	Understanding of the concept of asymptotes and graphical identification of examples	e.g. $f(x) = \tan x$ asymptotes at 90°, 270° etc. excludes algebraic derivation of asymptotes includes oblique asymptotes	
3.6	Use of a graphics calculator to: sketch the graph of a function produce a table of values find zeros, local maxima or minima find the intersection of the graphs of functions	 including unfamiliar functions not mentioned explicitly in this syllabus vertex of quadratic	 2.11 2.10
3.7	Simplify expressions such as $f(g(x))$ where $g(x)$ is a linear expression		
3.8	Description and identification, using the language of transformations, of the changes to the graph of $y = f(x)$ when $y = f(x) + k$, $y = k f(x)$, $y = f(x + k)$	 k an integer	5.4
3.9	Inverse function f^{-1}		5.5
3.10	Logarithmic function as the inverse of the exponential function $y = a^x$ equivalent to $x = \log_a y$ Rules for logarithms corresponding to rules for exponents Solution to $a^x = b$ as $x = \log b / \log a$.		

4	Geometry – Core curriculum	Notes	Link within syllabus
4.1	Use and interpret the geometrical terms: acute, obtuse, right angle, reflex, parallel, perpendicular, congruent, similar Use and interpret vocabulary of triangles, quadrilaterals, polygons and simple solid figures		
4.2	Line and rotational symmetry		7.8
4.3	Angle measurement in degrees		
4.4	Angles round a point Angles on a straight line and intersecting straight lines Vertically opposite angles Alternate and corresponding angles on parallel lines Angle sum of a triangle, quadrilateral and polygons Interior and exterior angles of a polygon Angles of regular polygons		
4.5	Similarity Calculation of lengths of similar figures		1.5
4.6	Pythagoras' Theorem in two dimensions Including: chord length distance of a chord from the centre of a circle distances on a grid		7.2
4.7	Use and interpret vocabulary of circles Properties of circles tangent perpendicular to radius at the point of contact tangents from a point angle in a semicircle	includes sector and segment	

4	Geometry – Extended curriculum	Notes	Link within syllabus
4.1	Use and interpret the geometrical terms: acute, obtuse, right angle, reflex, parallel, perpendicular, congruent, similar Use and interpret vocabulary of triangles, quadrilaterals, polygons and simple solid figures		
4.2	Line and rotational symmetry		7.8
4.3	Angle measurement in degrees		
4.4	Angles round a point Angles on a straight line and intersecting straight lines Vertically opposite angles Alternate and corresponding angles on parallel lines Angle sum of a triangle, quadrilateral and polygons Interior and exterior angles of a polygon Angles of regular polygons		
4.5	Similarity Calculation of lengths of similar figures Use of area and volume scale factors		1.5
4.6	Pythagoras' Theorem and its converse in two and three dimensions Including: chord length distance of a chord from the centre of a circle distances on a grid		5.3 7.2
4.7	Use and interpret vocabulary of circles Properties of circles: tangent perpendicular to radius at the point of contact tangents from a point angle in a semicircle angles at the centre and at the circumference on the same arc cyclic quadrilateral	includes sector and segment	

5	Transformations in two dimensions – Core Curriculum	Notes	Link within syllabus
5.1	Notation: Directed line segment $\overrightarrow{AB}$; component form $\begin{pmatrix} x \\ y \end{pmatrix}$		
5.2			
5.3			
5.4	Transformations on the Cartesian plane: translation, reflection, rotation, enlargement (reduction) Description of a translation using the notation in 5.1		3.8
5.5			
5.6			
6	**Mensuration – Core curriculum**	**Notes**	**Link within syllabus**
6.1	Units: mm, cm, m, km mm^2, cm^2, m^2, ha, km^2 mm^3, cm^3, m^3 ml, cl, l, g, kg, t	convert between units	
6.2	Perimeter and area of rectangle, triangle and compound shapes derived from these.	formula given for area of triangle	4.1
6.3	Circumference and area of a circle Arc length and area of sector	formulae given for circumference and area of a circle	
6.4	Surface area and volume of prism and pyramid (in particular, cuboid, cylinder and cone) Surface area and volume of sphere and hemisphere	formulae given for curved surface areas of cylinder, cone and sphere; volume of pyramid, cone, cylinder, prism and sphere	
6.5	Areas and volumes of compound shapes	simple cases only	

5	Transformations and vectors in two dimensions – Extended curriculum	Notes	Link within syllabus
5.1	Notation: Vector **a**; directed line segment $\overrightarrow{AB}$; component form $\begin{pmatrix} x \\ y \end{pmatrix}$		
5.2	Addition and subtraction of vectors Negative of a vector Multiplication of a vector by a scalar		
5.3	Magnitude $\lvert \mathbf{a} \rvert$		4.6 7.2
5.4	Transformations on the Cartesian plane: translation, reflection, rotation, enlargement (reduction), stretch Description of a translation using the notation in 5.1		3.8
5.5	Inverse of a transformation		3.9
5.6	Combined transformations		
6	**Mensuration – Extended curriculum**	**Notes**	**Link within syllabus**
6.1	Units: mm, cm, m, km mm^2, cm^2, m^2, ha, km^2 mm^3, cm^3, m^3 ml, cl, l, g, kg, t	convert between units	
6.2	Perimeter and area of rectangle, triangle and compound shapes derived from these		4.1
6.3	Circumference and area of a circle Arc length and area of sector		
6.4	Surface area and volume of prism and pyramid (in particular, cuboid, cylinder and cone) Surface area and volume of sphere and hemisphere	formulae given for curved surface areas of cylinder, cone and sphere; volume of pyramid, cone, cylinder, and sphere	
6.5	Areas and volumes of compound shapes		

7	Co-ordinate geometry – Core curriculum	Notes	Link within syllabus
7.1	Plotting of points and reading from a graph in the Cartesian plane		11.1
7.2	Distance between two points		4.6
7.3	Midpoint of a line segment		
7.4	Gradient of a line segment		
7.5	Gradient of parallel lines		
7.6	Equation of a straight line as $y = mx + c$ or $x = k$		
7.7			
7.8	Symmetry of diagrams or graphs in the Cartesian plane		4.2
8	**Trigonometry – Core curriculum**	**Notes**	**Link within syllabus**
8.1	Right-angled triangle trigonometry		
8.2			
8.3			
8.4			
8.5			
8.6			
8.7	Applications: three-figure bearings and North, East, South, West problems in two dimensions		
8.8			
9	**Sets – Core curriculum**	**Notes**	**Link within syllabus**
9.1	Notation and meaning for: is an element of ($\in$); is not an element of ($\notin$); is a subset of ($\subseteq$); is a proper subset of ($\subset$); universal set U, empty set $\varnothing$ or { }; complement of A, (A'); number of elements in A, n(A).		
9.2	Sets in descriptive form { x | } or as a list		2.1
9.3	Venn diagrams with at most two sets		
9.4	Intersection and union of sets		10.6

7	Co-ordinate geometry – Extended curriculum	Notes	Link within syllabus
7.1	Plotting of points and reading from a graph in the Cartesian plane		11.1
7.2	Distance between two points		4.6 5.3
7.3	Midpoint of a line segment		
7.4	Gradient of a line segment		
7.5	Gradient of parallel and perpendicular lines		
7.6	Equation of a straight line as $y = mx + c$ and $ax + by = d$ (a, b and d integer)		3.2
7.7	Linear inequalities on the Cartesian plane	shade unwanted regions	
7.8	Symmetry of diagrams or graphs in the Cartesian plane		3.2 4.2
8	**Trigonometry – Extended curriculum**	**Notes**	**Link within syllabus**
8.1	Right-angled triangle trigonometry		
8.2	Exact values for the trigonometric ratios of 0°, 30°, 45°, 60°, 90°		
8.3	Extension to the four quadrants i.e. 0°–360°		
8.4	Sine Rule	formula given, ASA SSA (ambiguous case)	
8.5	Cosine Rule	formula given, SAS, SSS	
8.6	Area of triangle	formula given	
8.7	Applications: three-figure bearings and North, East, South, West problems in two and three dimensions		
8.8	Properties of the graphs of $y = \sin x$, $y = \cos x$, $y = \tan x$	x in degrees	3.2 3.8
9	**Sets – Extended curriculum**	**Notes**	**Link within syllabus**
9.1	Notation and meaning for: is an element of ($\in$); is not an element of ($\notin$); is a subset of ($\subseteq$); is a proper subset of ($\subset$); universal set U, empty set $\varnothing$ or { }; complement of A, (A'); number of elements in A, n(A)		
9.2	Sets in descriptive form { x | } or as a list		2.1
9.3	Venn diagrams with at most three sets		
9.4	Intersection and union of sets		10.6

10	Probability – Core curriculum	Notes	Link within syllabus
10.1	Probability P(*A*) as a fraction, decimal or percentage Significance of its value		
10.2	Relative frequency as an estimate of probability		
10.3	Expected frequency of occurrences		
10.4	Combining events	simple cases only	
10.5	Tree diagrams including successive selection with or without replacement	simple cases only	
10.6	Probabilities from Venn diagrams and tables		9.3
11	**Statistics – Core curriculum**	**Notes**	**Link within syllabus**
11.1	Reading and interpretation of graphs or tables of data		7.1
11.2	Discrete and continuous data		
11.3	(Compound) bar chart, line graph, pie chart, stem and leaf diagram, scatter diagram		
11.4	Mean, mode, median, quartiles and range from lists of discrete data Mean, mode, median and range from grouped discrete data		
11.5	Mean from continuous data		
11.6			
11.7	Cumulative frequency table and curve Median, quartiles and inter-quartile range	read from curve	
11.8	Use of a graphics calculator to calculate mean, median and quartiles for discrete data and mean for grouped data		
11.9	Understanding and description of correlation (positive, negative or zero) with reference to a scatter diagram Straight line of best fit (by eye) through the mean on a scatter diagram	the coefficient of correlation is not required	

10	Probability – Extended curriculum	Notes	Link within syllabus
10.1	Probability P(A) as a fraction, decimal or percentage Significance of its value		
10.2	Relative frequency as an estimate of probability		
10.3	Expected frequency of occurrences		
10.4	Combining events: the addition rule P(A or B) = P(A) + P(B) the multiplication rule P(A and B) = P(A) × P(B)	mutually exclusive independent	
10.5	Tree diagrams including successive selection with or without replacement		
10.6	Probabilities from Venn diagrams and tables		9.3
11	**Statistics – Extended curriculum**	**Notes**	**Link within syllabus**
11.1	Reading and interpretation of graphs or tables of data		7.1
11.2	Discrete and continuous data		
11.3	(Compound) bar chart, line graph, pie chart, stem and leaf diagram, scatter diagram		
11.4	Mean, mode, median, quartiles and range from lists of discrete data Mean, mode, median and range from grouped discrete data		
11.5	Mean from continuous data		
11.6	Histograms with frequency density on the vertical axis using continuous data	includes histograms with unequal class intervals	
11.7	Cumulative frequency table and curve Median, quartiles, percentiles and inter-quartile range	read from curve	1.8
11.8	Use of a graphics calculator to calculate mean, median, and quartiles for discrete data and mean for grouped data		
11.9	Understanding and description of correlation (positive, negative or zero) with reference to a scatter diagram Straight line of best fit (by eye) through the mean on a scatter diagram Use a graphics calculator to find equation of linear regression	the coefficient of correlation is not required	

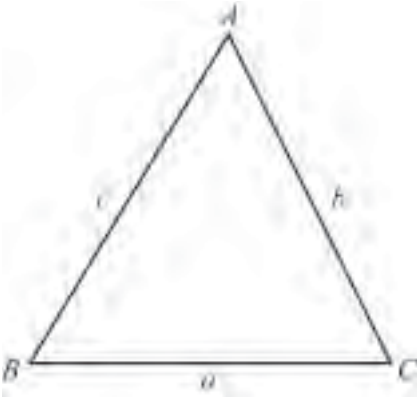
6. Appendix

List of formulae provided on Core Papers 1 and 3

Area, A, of triangle, base b, height h.	$A = \frac{1}{2}bh$
Area, A, of circle, radius r.	$A = \pi r^2$
Circumference, C, of circle, radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Curved surface area, A, of sphere with radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$

List of formulae provided on Extended Papers 2 and 4

Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Curved surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of pyramid, base area A, height h.	$V = \frac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \frac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \frac{4}{3}\pi r^3$



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

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

$$\text{Area} = \frac{1}{2}bc\sin A$$

For the equation $ax^2 + bx + c = 0$ $\quad x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

7. Other information

Equality and inclusion

Cambridge International Examinations has taken great care in the preparation of this syllabus and assessment materials to avoid bias of any kind. To comply with the UK Equality Act (2010), Cambridge has designed this qualification with the aim of avoiding direct and indirect discrimination.

The standard assessment arrangements may present unnecessary barriers for candidates with disabilities or learning difficulties. Arrangements can be put in place for these candidates to enable them to access the assessments and receive recognition of their attainment. Access arrangements will not be agreed if they give candidates an unfair advantage over others or if they compromise the standards being assessed.

Candidates who are unable to access the assessment of any component may be eligible to receive an award based on the parts of the assessment they have taken.

Information on access arrangements is found in the *Cambridge Handbook* which can be downloaded from the website **www.cie.org.uk**

Language

This syllabus and the associated assessment materials are available in English only.

Grading and reporting

Cambridge IGCSE results are shown by one of the grades A*, A, B, C, D, E, F or G indicating the standard achieved, A* being the highest and G the lowest. 'Ungraded' indicates that the candidate's performance fell short of the standard required for grade G. 'Ungraded' will be reported on the statement of results but not on the certificate. The letters Q (result pending); X (no results) and Y (to be issued) may also appear on the statement of results but not on the certificate.

Entry codes

To maintain the security of our examinations we produce question papers for different areas of the world, known as 'administrative zones'. Where the component entry code has two digits, the first digit is the component number given in the syllabus. The second digit is the location code, specific to an administrative zone. Information about entry codes, examination timetables and administrative instructions can be found in the *Cambridge Guide to Making Entries*.

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