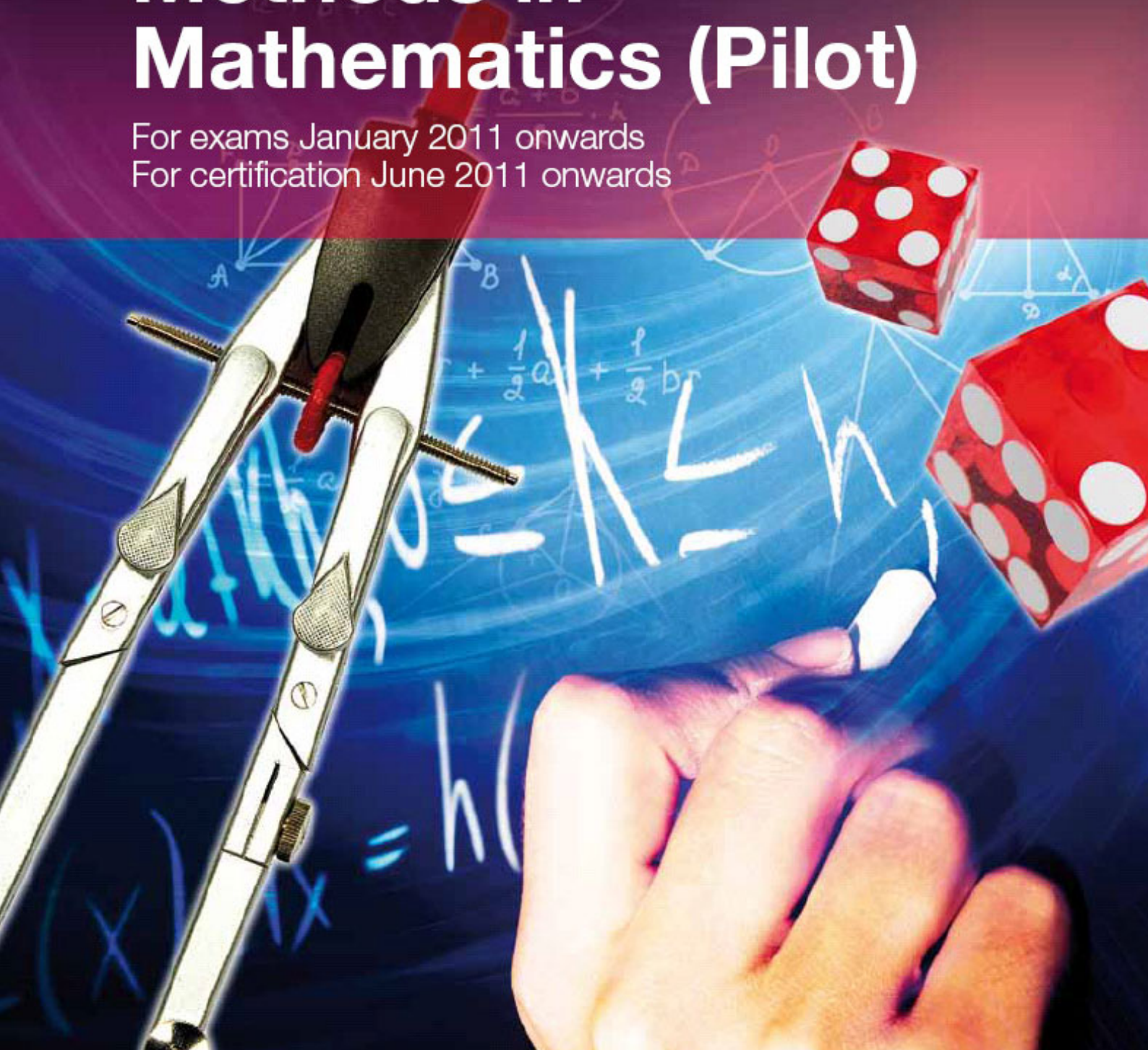![AQA logo]

GCSE
Specification

Methods in Mathematics (Pilot)

For exams January 2011 onwards
For certification June 2011 onwards

GCSE

Pilot Specification

Methods in Mathematics 9365

Contents

1 Introduction

1a Why choose AQA?

We are the United Kingdom's favourite exam board and more students get their academic qualifications from us than from any other board.
But why are we so popular?

**We understand the different requirements of each subject by working with teachers.
Our GCSEs:**

- help students achieve their full potential
- are relevant for today's challenges
- are manageable for schools and colleges
- are easy to understand by students of all levels of ability
- lead to accurate results, delivered on time
- are affordable and value for money

We provide a wide range of support services for teachers, including:

- access to subject departments
- training for teachers, including practical teaching strategies and approaches that work, presented by senior examiners

- individual support for Controlled Assessment
- 24-hour support through our website and online with **Ask AQA**
- past question papers and mark schemes
- a wide range of printed and electronic resources for teachers and students
- Free online results analysis, with Enhanced Results Analysis.

We are an educational charity focused on the needs of the learner. All our income is spent on improving the quality of our specifications, examinations and support services. We don't aim to profit from education, we want you to.

If you are already a customer we thank you for your support. If you are thinking of joining us we look forward to welcoming you.

1b Why choose this GCSE in Methods in Mathematics?

This GCSE qualification in Methods in Mathematics is one of a linked pair of mathematics qualifications which are being extensively piloted with two full cohorts of candidates from September 2010. The data and, crucially, centre feedback from this pilot work will feed into a comprehensive, independent evaluation which will inform a decision on the future of GCSE examinations in mathematics. If the pilot is deemed to be successful, first teaching nationally of a linked pair of GCSEs in the subject will commence in September 2015 at the latest, either alongside, or replacing the single GCSE in mathematics.

Hence, this pilot is an opportunity for schools and colleges to influence national policy in a vital subject area. In addition, it is a chance to be at the forefront of development and to be 'ahead of the game' in maths curriculum design and teaching.

Together, the linked pair cover all the skills and content of the single GCSE but will allow assessment of key aspects of this content in greater depth, providing a sound basis for further study in the subject.

Additionally, some new content not featured in the present single GCSE will be introduced.

It has been decided that achievement of grade A* to C in **either** of the pair will meet the mathematics requirement for 5 A* to C grades, including English and maths, in attainment tables. However, as it is necessary to study the pair of linked qualifications to fully cover the key stage 4 programme of study, entry for **both** pilot qualifications is required

Methods in Mathematics concentrates on maths as a discipline in its own right and as a powerful vehicle for developing skills of thinking, reasoning and problem solving. This specification will encourage learners to develop sound basic technique in number, algebra and geometry and then to be confident in applying those techniques in solving problems in mathematical contexts. This specification emphasises the coherence, creativity, elegance and power of mathematics leading learners to appreciate the importance of clear communication, justification and simple proof.

1c   How do I start using this specification?

It is our intention to have up to 10 000 candidates entered for each year of the pilot, representing a full range of centre types, geographical location and ability. Ideally, pilot centres will involve learners across the whole ability range but this is not a requirement and it is up to the centre who they decide to enter for this pilot.

It is, however, a requirement that all candidates within the pilot are entered for both of the linked pair (Applications and Methods). Hence, this specification and the associated specimen papers should be studied alongside the specification and specimens for the other qualification in the linked pair, Applications of Mathematics.

If you are interested in taking part in the pilot, you should let us know of your interest by sending an e mail to **mathspathways@aqa.org.uk** giving your name and contact details, centre name and centre number.

We will be formally recruiting centres from September 2009 when we will seek further details from interested centres.

1d   How can I find out more?

You can choose to find out more about this specification or the services that AQA offer in a number of ways.

Ask AQA

You have 24-hour access to useful information and answers to the most commonly asked questions at **www.aqa.org.uk/askaqa**

If the answer to your question is not available, you can submit a query through **Ask AQA** for our team. We will respond within 2 working days.

Speak to your subject team

You can talk directly to the GCSE Mathematics subject team about this specification either by

e-mailing **mathspathways@aqa.org.uk** or by calling 0161 957 3852

Teacher Support Meetings

As a pilot qualification, support for this specification will be organised by the subject team

Details of the full range of our Teacher Support meetings are available on our website at **www.aqa.org.uk/support/teachers**

There is also a link to our fast and convenient online booking system for our Teacher Support meetings at **www.events.aqa.org.uk/ebooking**

If you need to contact the Teacher Support team, you can call us on 01483 477860 or e-mail us at **teachersupport@aqa.org.uk.**

You can find out more including the latest news, how to register to use Enhanced Results Analysis, support and downloadable resources on our website at **www.aqa.org.uk**

2 Specification at a Glance

GCSE Methods in Mathematics

Unit M1: Methods in Mathematics
        (Algebra and Probability)

Foundation and Higher tiers

1 hour 30 minutes   (80 marks)

50% of total marks

Externally assessed by written paper
Section A (calculator allowed)
Section B (non-calculator)

PLUS

Unit M2: Methods in Mathematics
        (Geometry and Algebra)

Foundation and Higher tiers

1 hour 30 minutes   (80 marks)

50% of total marks

Externally assessed by written paper (calculator allowed)

3 Subject Content

3a Introduction

All the content in the linked pair of GCSEs in mathematics can be placed in one of four distinct groups

- Essential core skills which must feature in any mathematics qualification and are common to both of the pair and to the single GCSE, eg rules of arithmetic and properties of angles and shapes

- Content which is in the single GCSE and in both of the pair but is treated with a different emphasis in each of the linked pair qualifications, eg formal methods for solving linear equations will be in the methods exam whereas a method for solving a practical problem within the applications exam may be to set up a simple equation and solve it

- Content which is in the single GCSE but only in one of the pair, eg Geometry topics such as enlargements and other transformations and circle theorems are in methods only

- Content which is not in the single GCSE and is in one of the pair, eg vector geometry, set notation

The content for this Methods in Mathematics specification has been placed in two units (M1 and M2).

The content for Applications of Mathematics has also been placed in two units (A1 and A2).

The content tables for each unit have four columns

- Column 1 gives the Unit number and a content reference

- Column 2 lists the core content which may be assessed in both Foundation and Higher tiers

- Column 3 lists the additional content which may be assessed in the Higher tier only

- Column 4 features notes on how the content may be approached in that unit, and references other units of the pair in which that content appears. For example; A2 (N3) means that the same content appears in Applications Unit 2 under number reference 3.

Generally, the questions asked on a particular content area within this specification will reflect the title and aims of the specification, emphasising the role of mathematics as a creative discipline in its own right. For example, questions assessing the geometry content will concentrate on understanding the principles and techniques relating to properties of shapes and to solving problems that may be geometrical, such as using circle theorems, or which link together concepts of geometry, algebra and number.

To support coherent teaching, content that is common to this specification and to Applications of Mathematics, will generally appear in the corresponding unit, eg common Geometry content is in M2 and A2

An exception to this is in graph work. Graphical representations of algebraic functions feature in M1 whereas the practical application of these principles, including areas under graphs and gradient at a point is developed in A2.

3b   Unit M1: Methods in Mathematics (Algebra and Probability)

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
M1.N	**Number**		
1	Understand and use number operations and the relationships between them, including inverse operations and hierarchy of operations.		M2 (N1), A1 (N1), A2 (N1)
2	Arithmetic of real numbers: add, subtract, multiply and divide any number	Including exact calculation with surds and π Simplification of surds including rationalising a denominator.	Non-calculator arithmetic competency will be assessed in this unit. Calculations will be restricted to 3 digit integers and decimals up to two decimal places. Multiplication will be limited to 3- digit integers by 2-digit integers. For non-calculator work multiplication and division of decimals will be limited to multiplying or dividing by a single digit integer or decimal number to 1 significant figure. Addition and subtraction of fractions without a calculator will be assessed. M2 (N2)
3	Numbers and their representations including powers, roots, indices (integers)	Extend to fractional and negative indices, and use of standard index form.	A1 (N2)
4		Approximate to appropriate degrees of accuracy.	A1 (N3)
5	Use the concepts and vocabulary of factor (divisor), multiple and prime numbers.		The explicit testing of these terms will be in M2 M2 (N5, N6)
6	Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions.		M2 (N7), A1 (N5), A2 (N4)
7	Use multipliers for percentage change.	Work with repeated percentage change; solve reverse percentage problems.	A1 (N6)

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
8	Interpret fractions, decimals and percentages as operators.		In non-calculator questions, candidates should be able to calculate 1% and 10% of quantities as a starting point and use 'build-up' methods A1 (N7)
9	Understand and use the relationship between ratio, fractions and decimal representations	Including recurring and terminating decimals.	Including reduction of a ratio to its simplest form.
10	Understand and use direct proportion.	Extend to include inverse proportion.	A1 (N8)
11	Divide a quantity in a given ratio.		A1 (N9), A2 (N6)
12	Use calculators effectively and efficiently.		Candidates should know not to round off values during the intermediate steps of a calculation. M2 (N10), A1 (N10), A2 (N7)
M1.A	**Algebra**		
1	Distinguish the different roles played by letter symbols in algebra, using the correct notation.		M2 (A1)
2	Distinguish in meaning between the words equation, inequality, formula and expression.	The meaning of identity and knowledge of the identity symbol will also be expected.	
3	Manipulate algebraic expressions by collecting like terms, by multiplying a single term over a bracket, taking out common factors.	Multiplying two linear expressions, factorising quadratic expressions including the difference of two squares, and simplifying rational expressions.	Including $(x \pm a)\,(x \pm b)$ and $(cx \pm a)\,(dx \pm b)$ at Higher tier. Candidates should be able to cancel rational expressions and apply the four rules to algebraic fractions. M2 (A2), A1 (A1)
4	Set up, and solve simple equations and inequalities.		M2 (A3), A1 (A2), A2 (A1)
5		Set up and use equations that describe direct and inverse proportion.	Candidates would be expected to set up an equation using a constant of proportionality.
6		Set up, and solve simultaneous equations in two unknowns where one of the equations might include squared terms in one or both unknowns.	A1 (A6)
7	Solve quadratic equations approximately using a graph.		

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
8	Derive a formula, substitute numbers into a formula and change the subject of a formula.		At Foundation tier formulae to be rearranged will need at most two operations. Formulae where a power appears will not be tested at Foundation tier. In Higher tier questions the subject may appear twice. A1 (A3)
9	Use algebra to support and construct arguments.	Use algebra to construct simple proofs	
10	Use the conventions for coordinates in the plane and plot points in all four quadrants.	3D coordinate systems.	M2 (A7), A2 (A2)
11	Recognise and plot equations that correspond to straight-line graphs in the coordinate plane.		A2 (A3)
12		Use $y = mx + c$ and understand the relationship between gradients of parallel and perpendicular lines.	Candidates will be expected to obtain the equation of a line perpendicular to a known line.
13		Draw, sketch, recognise graphs of linear, quadratic simple cubic functions, the reciprocal function $y = \frac{1}{x}$ with $x \neq 0$, the function $y = k^x$ for integer values of x and simple positive values of k, the trigonometric functions $y = \sin x$, $y = \cos x$ and $y = \tan x$.	
14		Understand and use the Cartesian equation of a circle centred at the origin and link to the trigonometric functions.	
15		Construct the graphs of simple loci.	
16		Sketch simple transformations of a given function.	

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
M1.P	**Probability**		
1	Understand and use the vocabulary of probability and the probability scale.		Words used will be 'impossible', 'very unlikely', 'unlikely', 'evens', 'likely', 'very likely' and 'certain'. A1 (S1)
2	Understand and use theoretical models for probabilities including the model of equally likely outcomes.		Probabilities should be written as fractions, decimals or percentages. Cancelling a fraction to simplest form may be required. A1 (S2)
3	Understand and use estimates of probability from relative frequency.		A1 (S3)
4	Use of sample spaces for situations where outcomes are single events and for situations where outcomes are two successive events.		
5	Identify different mutually exclusive and exhaustive outcomes and know that the sum of the probabilities of all these outcomes is 1		The phrase 'mutually exclusive' will not be used in the examination.
6	Understand and use set notation to describe events and compound events.		
7	Use Venn diagrams to represent the number of possibilities and hence find probabilities.		Questions will involve knowledge and use of set notation, A, A', A ∩ B, A U B.
8		Use tree diagrams to represent outcomes of compound events, recognising when events are independent or dependent.	
9		Know when to add or multiply probabilities: if A and B are mutually exclusive, then the probability of A or B occurring is $P(A) + P(B)$; if A and B are independent events, the probability of A and B occurring is $P(A) \times P(B)$.	Includes conditional probability.

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
10	Compare experimental data and theoretical probabilities, and make informal inferences about the validity of the model giving rise to the theoretical probabilities.		Knowledge of the term 'relative frequency' is expected.
11	Understand that when a statistical experiment or survey is repeated there will usually be different outcomes, and that increasing sample size generally leads to better estimates of probability and population characteristics.		A1 (S17)

3c   Unit M2: Methods in Mathematics
(Geometry and Algebra)

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
M2.N	**Number**		
1	Understand and use number operations and the relationships between them, including inverse operations and hierarchy of operations.		M2 (N1), A1 (N1), A2 (N1)
2	Arithmetic of real numbers.	Including exact calculation with surds and π	. Answers may be required in these forms. M1 (N2)
3	Numbers and their representations including powers, roots, indices (integers).		M1 (N3), A1 (N2) Specifically tested in M1 and A1.
4	Approximate to specified degrees of accuracy including a given power of ten, number of decimal places and significant figures.		Nearest ten, hundred or thousand at Foundation tier. A2 (N3)
5	Use the concepts and vocabulary of factor (divisor), multiple, common factor, common multiple, highest common factor, least common multiple, prime number and prime factor decomposition.		
6	Understand that factors of a number can be derived from its prime factorisation.		
7	Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions.		
8	Understand and use the relationship between ratio and fractions.		
9	Find proportional change, using fractions, decimals and percentages.	Including repeated proportional change.	

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
10	Use calculators effectively and efficiently.	Including trigonometric functions.	Candidates should know not to round off values during the intermediate steps of a calculation. M1 (N12), A1 (N10), A2 (N7)
11	Understand and use Venn diagrams to solve problems.		Simple numerical problems where the use of a Venn diagram aids the solution. Set notation will not be assessed in this unit
M2.A	**Algebra**		
1	Distinguish the different roles played by letter symbols in algebra, using the correct notation.		M1 (A1)
2	Manipulate algebraic expressions by collecting like terms, by multiplying a single term over a bracket, taking out common factors.	Multiplying two linear expressions, factorising quadratic expressions including the difference of two squares, and simplifying rational expressions.	M1 (A3)
3	Set up, and solve simple equations.		M1 (A4), A1 (A2), A2 (A1)
4		Solve quadratic equations exactly by factorising, completing the square and using the formula.	
5	Generate terms of a sequence using term-to-term and position-to-term definitions.		
6	Form linear expressions to describe the nth term of a sequence	Form quadratic expressions to describe the nth term of a sequence.	
7	Use the conventions for coordinates in the plane and plot points in all four quadrants.		M1 (A10), A2 (A2)
8	Use geometric information to complete diagrams on a co-ordinate grid.		
9	Recognise and use equivalence in numerical, algebraic and graphical representations.		Candidates should be able to move from one form of representation to another to get different perspectives on the problem.

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
M2.G	**Geometry**		
1	Recall and use properties of angles at a point, angles at a point on a straight line (including right angles), perpendicular lines, and vertically opposite angles.		A2 (G1)
2	Understand and use the angle properties of parallel and intersecting lines, triangles and quadrilaterals.		Candidates should know the meaning and properties of 'alternate', 'corresponding', 'interior' and 'vertically opposite' angles. Colloquial terms such as 'Z angles' should not be used. Candidates should know the names and properties of isosceles, equilateral, right-angled and scalene triangles. A2 (G2)
3	Recall the properties and definitions of special types of quadrilateral, including square, rectangle, parallelogram, trapezium, kite and rhombus.		A2 (G3)
4	Recognise reflection and rotation symmetry of 2D shapes.		A2 (G4)
5	Calculate and use the sums of the interior and exterior angles of polygons.		Candidates should be able to calculate the values of the interior angle, exterior angle and angle at the centre of regular polygons. At Foundation tier these will be restricted to triangle, square, pentagon, hexagon, octagon, nonagon and decagon.
6	Solve problems in the context of tiling patterns and tessellation.		Candidates will be required to know that the sum of the angles at a point is 360°

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
7		Understand, prove and use circle theorems and the intersecting chords theorem	Includes cyclic quadrilaterals; angle at centre is twice angle at circumference; angle in a semi-circle is 90º; angles in the same segment are equal; opposite angles in cyclic quadrilateral sum to 180º; alternate segment theorem.
8		Understand and use the midpoint and the intercept theorems.	The two forms of the midpoint theorem should be known.
9		Understand and construct geometrical proofs using formal arguments, including proving the congruence, or non congruence of two triangles in all possible cases.	
10	Describe and transform 2D shapes using single or combined rotations, reflections, translations, or enlargements by a positive scale factor and distinguish properties that are preserved under particular transformations.	Enlargements by positive fractional and negative scale factors.	
11	Use 2D vectors to describe translations.		
12		Use vectors to solve simple geometric problems and construct geometric arguments.	Understand and use vector notation; calculate and represent graphically the sum of two vectors; the difference of two vectors and a scalar multiple of a vector; calculate the resultant of two vectors; understand and use the commutative and associative properties of vector addition.
13	Understand congruence and similarity, including the relationship between lengths, in similar figures.	Including the relationship between areas and volumes of similar shapes.	A2 (G5)
14	Use Pythagoras' theorem in 2D.	Extend to 3D.	A2 (G6)

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
15		Use the trigonometric ratios to solve 2D and 3D problems. Use the sine and cosine rules to solve problems in 2D and 3D.	A2 (G8)
16	Distinguish between centre, radius, chord, diameter, circumference, tangent, arc, sector and segment.		A2 (G7)
17	Find circumferences of circles and areas enclosed by circles.		A2 (G14)
18	Calculate perimeters and areas of shapes made from triangles and rectangles	Extend to other compound shapes.	eg, shapes made from circles or part circles with other known shapes. A2 (G15)
19		Calculate the area of a triangle using $\frac{1}{2}ab \sin C$.	
20	Calculate volumes of right prisms and of shapes made from cubes and cuboids.		Including cylinders. A2 (G16)
21		Solve mensuration problems involving more complex shapes and solids.	Including cones and spheres. Including compound shapes and frustums A2 (G17)

3d   Process skills

There is no requirement in this specification to assess the functional elements of the subject. These will be assessed within the Applications of Mathematics half of the linked pair.

However, the process skills of Representing, Analysing and Interpreting which make up the functional skills will also underpin this qualification but, generally, not within functional contexts.

Representing

In this qualification, this is about choosing methods and developing strategies to solve mathematical problems including breaking more complex problems down into simple steps and working systematically

Analysing

This is about using mathematical procedures appropriately and accurately but also about reasoning mathematically, making connections between different areas of mathematics and identifying patterns

Interpreting

This is about presenting convincing arguments including formal proof and communicating methods and solutions clearly

4 | Scheme of Assessment

4a   Aims and learning outcomes

GCSE courses based on this specification should encourage candidates to:

- be inspired, moved and changed by following a broad, coherent, satisfying and worthwhile course of study. They should help learners to develop confidence in, and a positive attitude towards, mathematics and to recognise the importance and relevance of mathematics in their own lives and to society. They should enable learners to make informed judgments about the use of technology. Specifications should enable learners to appreciate the coherence, creativity, elegance and power of mathematics. They should prepare learners to make informed decisions about further learning opportunities and career choices.

GCSE courses based on this specification must enable candidates to:

- develop knowledge, skills and understanding of mathematical and statistical methods, techniques and concepts.

- make connections between different areas of mathematics

- select and apply mathematical methods in mathematical contexts

- reason mathematically, construct arguments and simple proofs, and make logical deductions and inferences

- develop and refine strategies for solving a range of mathematical problems

4b   Assessment Objectives (AOs)

The assessment units will assess the following assessment objectives in the context of the content and skills set out in Section 3 (Subject Content).

AO1:	Recall and use their knowledge of the prescribed content.
AO2:	Select and apply mathematical methods in a range of contexts.
AO3:	Interpret and analyse problems and use mathematical reasoning to solve them.

Quality of written communication (QWC)

In all GCSE specifications which need candidates to write in English, candidates must do the following.

- Make sure that the text is clear and that spelling; punctuation and grammar are accurate so the meaning is clear.

- Select and use a form and style of writing that suits the subject.

- Organise information clearly and understandably, using specialist vocabulary when relevant.

In this mathematics specification, it is expected that in all questions, candidates will:

- Use correct and accurate mathematical notation and vocabulary.

- Organise their work clearly.

- Use correct spelling, punctuation and grammar in any explanations they are asked to provide.

However, in each unit, some questions will explicitly assess QWC. These will be listed on the front cover of each examination paper and marked with an asterisk alongside the question number within the body of the examination paper.

Weighting of Assessment Objectives

The table below shows the approximate weighting of each of the Assessment Objectives in the GCSE units

Assessment Objective	Unit Weightings (%)		Overall weighting of AOs (%)
	Unit M1	Unit M2	
AO1	25 - 30	25 - 30	50 - 60
AO2	7 - 13	7 - 13	15 - 25
AO3	10 - 15	10 - 15	20 - 30
Overall weighting of units (%)	50	50	

4c   National Criteria

This specification is in line with the following.

- The framework for piloting for GCSE Methods in Mathematics
- The Code of Practice
- The GCSE Qualification Criteria

- The Arrangements for the Statutory Regulation of External Qualifications in England Wales and Northern Ireland: Common Criteria
- The requirements for qualifications to provide Levels 1 and 2 of the National Qualification Framework

4d   Previous learning requirements

There are no prior learning requirements.

However, any requirements set for entry to a course based on this specification are at your centre's discretion.

4e   Access to assessment: diversity and inclusion

GCSE often need to access a wide range of competences. This is because they are general qualifications designed to prepare candidates for a wide range of occupations and further study.

The revised GCSE qualification and subject criteria were reviewed to see whether any of the skills or knowledge needed by candidates, whatever their ethnic background, religion, sex, age, disability or sexuality. If there were difficulties, the situation was reviewed again to make sure that such tests of specific competences were only included if they were important to the subject.

The findings were discussed with groups who represented the interests of a diverse range of candidates.

Arrangements are made for candidates with special needs to help them access the assessments as long as the competences being tested are not changed. Because of this, most candidates will be able to access any part of the assessment. More details are given in Section 5d.

5 Administration

5a Availability of assessment units and certification

Examinations and certification for this specification are available as follows.

	Availability of units		Availability of certification GCSE
	Unit M1	Unit M2	
January 2011	✓		
June 2011	✓	✓	✓
January 2012	✓	✓	✓
June 2012	✓	✓	✓
January 2013	✓	✓	✓
June 2013	✓	✓	✓

5b Entries

Please check the current version of **Entry Procedures and Codes** for up-to-date entry procedures. You should use the following entry codes for the units and for certification.

Unit 1 – 93651F; 93651H

Unit 2 – 93652F; 93652H

GCSE certification – 9367

A separate entry is need for each of the two units. In addition, an entry must be submitted for the overall subject award, 9367.

5c Private candidates

This specification is not available to private candidates

5d Access arrangements, reasonable adjustments and special consideration

We have taken note of the equality and discrimination legislation and the interests of minority groups in developing and administering this specification.

We follow guidelines in the Joint Council for Qualifications (JCQ) document: *Access Arrangements, Reasonable Adjustments and Special Consideration*: *General and Vocational Qualifications*. This is published on the JCQ website **www.jcq.org.uk** or you can follow the link from our website **www.aqa.org.uk**

Access arrangements

We can arrange for candidates with special needs to access assessment. These arrangements must be made **before** the examination. For example, we can produce a Braille paper for a candidate with sight problems.

Reasonable adjustments

An access arrangement which meets the needs of a particular disabled candidate would be a reasonable adjustment for that candidate. For example a Braille paper would be a reasonable adjustment for a Braille reader but not for a candidate who did not read Braille. The Disability Discrimination Act requires us to make reasonable adjustments to remove or lessen any disadvantage affecting a disabled candidate.

Special consideration

We can give special consideration to candidates who have had a temporary illness, injury or serious problem such as death of a relative, at the time of the examination. We can only do this **after** the examination.

The Examinations Officer at the centre should apply online for access arrangements and special consideration by following the eAQA link from our website **www.aqa.org.uk**

5e Examination language

We only provide units for this specification in English.

5f Qualification titles

The qualification based on this specification is:

- AQA GCSE in Methods in Mathematics.

This qualification will count as the mathematics requirement for 5 A* to C GCSEs including English and maths in school and college achievement and attainment tables providing the GCSE in Applications of Mathematics has also been entered, although this need not be in the same series.

5g   Awarding grades and reporting results

The GCSE and GCSE short course qualifications will be graded on an eight-grade scale: A*, A, B, C, D, E, F and G. Candidates who fail to reach the minimum standard for grade G will be recorded as 'U' (unclassified) and will not receive a qualification certificate.

We will publish the minimum raw mark for each grade, for each unit, when we issue candidates' results. We will report a candidate's unit results to your centre in terms of uniform marks and qualification results in terms of uniform marks and grades.

For each unit, the uniform mark corresponds to a grade as follows.

Unit 1 maximum uniform mark = 100

Unit 2 maximum uniform mark = 100

Overall maximum uniform mark = 200

Unit 1	
Grade	Uniform Mark Range
A*	90 -100
A	80 - 89
B	70 - 79
C	60 - 69
D	50 - 59
E	40 - 49
F	30 - 39
G	20 - 29
U	0 - 19

Unit 2	
Grade	Uniform Mark Range
A*	90 -100
A	80 - 89
B	70 - 79
C	60 - 69
D	50 - 59
E	40 - 49
F	30 - 39
G	20 - 29
U	0 - 19

We calculate a candidate's total uniform mark by adding together the uniform marks for the units. We convert this total uniform mark to a grade as follows:

Overall	
Grade	Uniform Mark Range
A*	180 - 200
A	160 - 179
B	140 - 159
C	120 - 139
D	100 - 119
E	80 - 99
F	60 - 79
G	40 - 59
U	0 - 39

5h   Re-sits and how long unit results remain available to count towards certification

Unit results remain available to count towards certification within the shelf life of the specification, whether or not they have already been used.

Candidates can re-sit each unit once before they certificate. The better result for each unit will count towards the final qualification. However, candidates can re-sit the qualification as many times as they want to.

Candidates' grades are based on the work they submit for assessment.

Appendices

A   Formulae Sheets

Foundation and Higher Tiers   Unit M1

Set notation

A
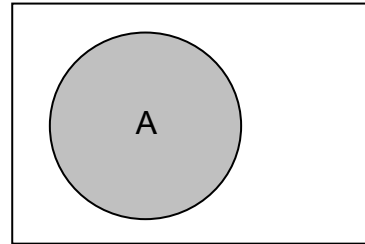
A'
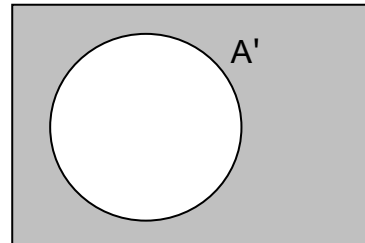
$A \cap B$
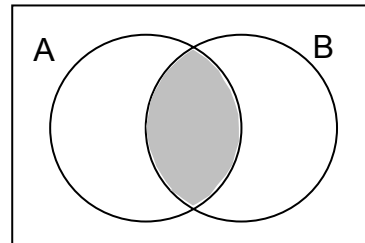
$A \cup B$
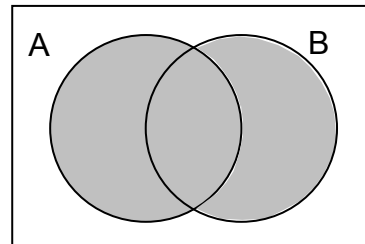
Foundation Tier   Unit M2

Area of trapezium = $\frac{1}{2}(a + b)h$
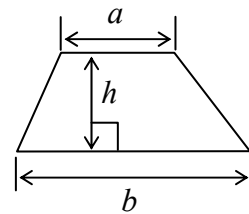
Volume of prism = area of cross-section × length
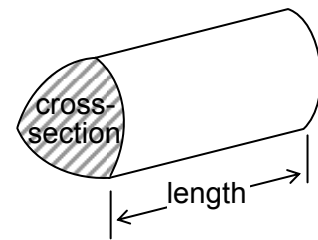
Higher Tier   Unit M2

Area of trapezium = $\frac{1}{2}(a + b)h$
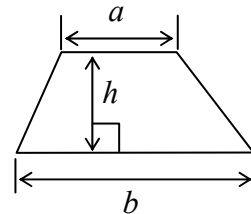
Volume of prism = area of cross-section × length
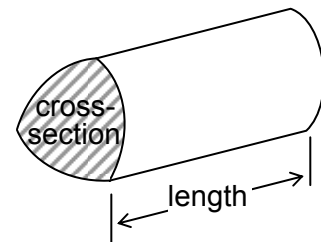
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$
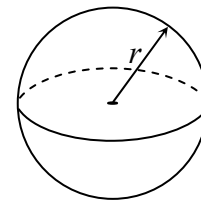
Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$
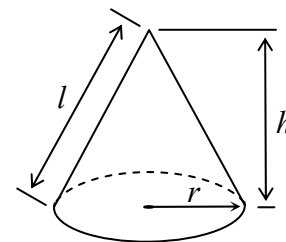
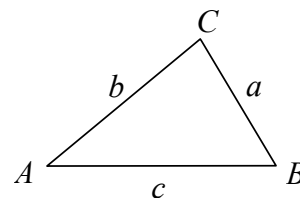**In any triangle** ABC

Area of triangle = $\frac{1}{2}ab \sin C$

Sine rule $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

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

B Spiritual, Moral, Ethical, Social, Legislative, Sustainable Development, Economic and Cultural Issues, and Health and Safety Considerations

We have taken great care to make sure that any wider issues (for example, spiritual, moral, ethical, social, legal, sustainable development, economic and cultural issues), including those relevant to the education of students at Key Stage 4, have been taken into account when preparing this specification. They will only form part of the assessment requirements where they are relevant to the specific content of the specification and have been identified in Section 3: Content.

European Dimension

We have taken the 1988 Resolution of the Council of the European Community into account when preparing this specification and associated specimen units.

Environmental Education

We have taken the 1988 Resolution of the Council of the European Community and the Report 'Environmental Responsibility: An Agenda for Further and Higher Education' 1993 into account when preparing this specification and associated specimen units.

Avoiding bias

We have taken great care to avoid bias of any kind when preparing this specification and specimen units.

C Overlaps with other qualifications

This qualification in Methods in Mathematics is intended to be taken alongside Applications of Mathematics as a linked pair.

There is considerable overlap in content and skills between this specification and all GCSE specifications in Mathematics.

There is some overlap between Unit M1 of this specification and GCSE Statistics.

D   Wider Key Skills – Teaching, Developing and Providing Opportunities for Generating Evidence

Introduction

The Key Skills Qualification requires candidates to demonstrate levels of achievement in the Key Skills of Communication, Application of Number and Information and Communication technology.

The Wider Key Skills of Improving own Learning and Performance, Working with Others and Problem Solving are also available. The acquisition and demonstration of ability in these 'wider' Key Skills is deemed highly desirable for candidates.

Copies of the Key Skills Standards may be downloaded from QCA's website: **www.qca.gov.uk**

The units for each key skill comprise three sections:

- What you need to know
- What you must do
- Guidance

Candidates following a course of study based on this specification for Application in Mathematics can be offered opportunities to develop and generate evidence of attainment in aspects of the Key Skills of:

- Communication
- Application of Number

- Information and Communication Technology
- Working with Others
- Improving own Learning and Performance
- Problem Solving

Areas of study and learning that can be used to encourage the acquisition and use of Key Skills, and to provide opportunities to generate evidence for Part B of units, are provided in the Teachers' Resource Bank for this specification.

The above information is given in the context of the knowledge that Key Skills at levels 1 and 2 will be available until 2010 with last certification in 2012. Key Skills Qualifications of Communication, Application of Number and Information and Communication Technology will be phased out an replaced by Functional Skills qualifications in English, mathematics and ICT from September 2010 onwards. Candidates following a course of study based on this specification for Application in Mathematics can be offered opportunities to develop and generate evidence of attainment in aspects of the Functional and Key Skills.

GCSE Methods in Mathematics (Pilot)

Qualification Accreditation Number: 500/7942/6

Every specification is assigned a national classification code indicating the subject area to which it belongs. The classification code for this specification has yet to be confirmed.

Centres should be aware that candidates who enter for more than one GCSE qualification with the same classification code will have only one grade counted for the purpose of the School and College Performance Tables. In the case of a candidate taking two qualifications with the same classification code that are of the same size and level, eg two full course GCSEs, the higher grade will count.

Centres may wish to advise candidates that, if they take two specifications with the same classification code, schools and colleges are very likely to take the view that they have achieved only one of the two GCSEs. The same view may be taken if candidates take two GCSE specifications that have different classification codes but have significant overlap of content. Candidates who have any doubts about their subject combinations should check with the institution to which they wish to progress before embarking on their programmes.

To obtain specification updates, access our searchable bank of frequently asked questions, or to ask us a question, register with Ask AQA:

aqa.org.uk/ask-aqa/register

You can also download a copy of the specification and support materials from our website:

aqa.org.uk/mathszone

Free launch meetings are available in 2010 followed by further support meetings through the life of the specification. Further information is available at:

http://events.aqa.org.uk/ebooking

Corporate member of
Plain English Campaign
Committed to clearer communication.

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