AQA

GCSE

Specification

Applications of Mathematics (Pilot)

For exams January 2011 onwards
For certification June 2011 onwards

GCSE

Pilot Specification

Applications of Mathematics 9370

Our specification is published every year on our website (http://www.aqa.org.uk). We will let centres know in writing about any changes to the specification. We will also publish changes on our website. The definitive version of our specification will always be the one on our website, this may differ from printed versions.

You can get further copies of this pilot specification from:
AQA GCSE Mathematics Team
Devas St
Manchester
M15 6EX
Telephone 0161 957 3852
Or, you can download a copy from our website (www.aqa.org.uk).

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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 Applications of Mathematics?

This GCSE qualification in Applications of 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

Applications of Mathematics concentrates on the skills and content that is required in our everyday lives and in gaining a mathematical understanding of the world around us. Questions on all topic areas emphasise the relevance and purpose of the subject with many set in financial, scientific and other relevant, realistic contexts.

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 each 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, Methods in 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.php**

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 Applications of Mathematics

Unit A1: Applications of Mathematics (Finance and Statistics)

Foundation and Higher tiers

1 hour 30 minutes 80 marks

50% of total marks

Externally assessed by written paper (calculator allowed)

PLUS

Unit A2: Applications of Mathematics (Geometry and Measures)

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 A method for solving a practical problem may be to set up a simple equation and solve it within the applications exam whereas formal methods for solving linear equations will be in the methods exam
- Content which is in the single GCSE but only in one of the pair, eg All statistics topics are in applications only whereas probability content is in methods only
- Content which is not in the single GCSE and is in one of the pair, eg linear programming.

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

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

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 M2 (N3) means that the same content appears in Methods 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 vital tool for work, education and everyday life. For example, questions assessing the Geometry content will concentrate on how principles of area, volume and shape can be applied in realistic contexts.

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

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 A1: Applications of Mathematics (Finance and Statistics)

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
A1.N	**Number**		
1	Understand and use number operations and the relationships between them, including inverse operations and hierarchy of operations.		A2 (N1), M1 (N1), M2 (N1)
2	Numbers and their representations including powers, roots, indices (integer values).	Extend to fractional and negative indices, and use of standard index form.	M1 (N3)
3		Approximate to appropriate degrees of accuracy	M1 (N4)
4		Understand and use upper and lower bounds.	Including maximum and minimum. Questions will be set in context and could be linked to statistical problems.
5	Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions.		A2 (N4), M1 (N6), M2 (N7)
6	Use multipliers for percentage change.	Work with repeated percentage change; solve reverse percentage problems.	Calculations with percentages in financial and other realistic contexts will feature in this unit M1 (N7)
7	Interpret fractions, decimals and percentages as operators.		Candidates should be able to use a calculator to apply the four rules to fractions and decimals in problems. M1 (N8)
8	Understand and use direct proportion.	Extend to include inverse proportion.	M1 (N10)
9	Divide a quantity in a given ratio.		A2 (N6), M1 (N11)
10	Use calculators effectively and efficiently, including statistical functions.		Candidates should know not to round off values during the intermediate steps of a calculation. A2 (N7), M1 (N12), M2 (N10)

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
A1.F	**Financial and Business Applications**		
1	Carry out calculations relating to enterprise, saving and borrowing, appreciation and depreciation.	Understand AER.	Candidates should be familiar with common terms such as VAT, income tax and interest rates. Compound interest calculations will be required on higher tier.
2	Use mathematics in the context of personal and domestic finance including loan repayments, budgeting, *RPI and CPI* exchange rates and commissions.		
	Use spreadsheets to model financial, statistical and other numerical situations.		Including the use of a simple formula.
4	Construct and use flow charts.		These may be set in financial or other contexts.
A1.A	**Algebra**		The algebra in this unit will be limited to practical applications of formulae and equations plus the algebra required to engage in linear programming problems
1	Manipulate algebraic expressions by collecting like terms, by multiplying a single term over a bracket, and by taking out common factors.		M1 (A3), M2 (A2)
2	Set up, and solve simple equations and inequalities.		A2 (A1), M1 (A4), M2 (A3)
3	Derive a formula, substitute numbers into a formula.		M1 (A8)
4	Solve linear inequalities in one variable, and represent the solution set on a number line.	Solve linear inequalities in two variables, and represent the solution set on a suitable diagram.	Candidates should know and use the symbols <, >, ≤ and ≥. Candidates should know the convention of an open circle on a number line for a strict inequality and a closed circle for an included boundary. Higher tier candidates should identify regions on a 2D coordinate grid. The convention of a dashed line for strict inequalities and a solid line for an included inequality need not be known.

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
5		Set up and solve problems in linear programming, finding optimal solutions.	
6		Set up and solve linear simultaneous equations in two unknowns.	M1 (A6)
A1.S	**Statistics and Probability**		
1	Understand and use the vocabulary of probability and the probability scale.		In this unit, probability questions will be about applying probability theory to statistical problems. M1 (P1)
2	Understand and use theoretical models for probabilities including the model of equally likely outcomes.		M1 (P2)
3	Understand and use estimates of probability from relative frequency.		M1 (P3)
4	Understand and use the statistical problem solving process/handling data cycle which involves • specifying the problem and planning • collecting data • processing and presenting the data • interpreting and discussing the results.		Including knowing and using the term “hypothesis” for a general prediction which is to be tested. Higher tier candidates will be expected to choose suitable sampling methods, discuss bias, provide sophisticated and rigorous interpretations of their data and provide an analysis of how significant their findings are.
5	Design an experiment or survey, identifying possible sources of bias.		An understanding of the terms “primary data” and “secondary data” is expected.
6	Design data-collection sheets distinguishing between different types of data.		Includes observation, controlled experiment, data logging questionnaires and surveys.
7	Extract data from publications, charts, tables and lists.		
8	Design, use and interpret two-way tables for discrete and grouped data.		
9	Look at data to find patterns and exceptions.		For example identifying a “rogue” value from a scatter diagram.

Unit 1	Core (Foundation and Higher tiers)	Higher tier only	Notes
10	Compare distributions and make inferences.		Comparisons of average and range at tier F, and average and inter-quartile range at tier H.
11	Produce and interpret charts and diagrams for categorical data including bar charts, multiple bar charts, pie charts and pictograms.		
12	Produce and interpret diagrams for grouped and ungrouped numerical data, including tally charts, vertical line graphs, stem-and-leaf diagrams, frequency polygons and histograms with equal class intervals.	Produce and interpret diagrams for grouped discrete data and continuous data, including histograms with unequal class intervals.	Candidates should be able to read information from and interpret these charts and diagrams.
13		Produce and use cumulative frequency graphs and box-and-whisker plots.	
14	Work with time series including their graphical representation.	Work with moving averages including their graphical representation.	Candidates will be expected to comment on and use the trends shown by the moving average, and use it to predict further values.
15	Calculate, median, mean, range, mode and modal class.	For grouped data, estimate quartiles and inter-quartile range.	From charts, diagrams, lists and tables of data, including median and range from a stem-and-leaf diagram
16	Recognise correlation and draw and/or use lines of best fit by eye, understanding and interpreting what these represent, and appreciating that correlation does not imply causality.		Candidates will be required to recognise when correlation is weak or strong, positive or negative, but will not be asked to comment on the reliability of the data. Candidates should understand that using a line of best fit outside the plotted range may not be reliable.
17	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.		M1 (P11)
18	Discuss and start to estimate risk.		

3c Unit A2: Applications of Mathematics (Geometry and Measures)

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
A2.N	**Number**		
1	Understand and use number operations and the relationships between them, including inverse operations and hierarchy of operations.		A1 (N1), M1 (N1), M2 (N1)
2	Use the concepts and vocabulary of factor (divisor), multiple, common factor, common multiple and prime number.		
3	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. M2 (N4)
4	Understand that 'percentage' means 'number of parts per 100' and use this to compare proportions.		A1 (N5), M1 (N6), M2 (N7)
5	Find proportional change.	Repeated proportional change, exponential growth/decay, its relationship with repeated proportional change including financial and scientific applications.	
6	Divide a quantity in a given ratio.		A1 (N9), M1 (N11)
7	Use calculators effectively and efficiently.	Including trigonometric functions	Candidates should know not to round off values during the intermediate steps of a calculation. A1 (N10), M1 (N12), M2 (N10)
A2.M	**Measures**		
1	Interpret scales on a range of measuring instruments and recognise the inaccuracy of measurements.		

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
2	Convert measurements from one unit to another.		Metric conversions should be known. Imperial to metric conversions will be limited to 5 miles ≈ 8 kilometres, 4.5 litres ≈ 1 gallon, 2.2 pounds ≈ 1 kilogram and 1 inch ≈ 2.5 centimetres.
3	Make sensible estimates of a range of measures.		
4	Understand and use compound measures in familiar and unfamiliar contexts.		Including area, volume and speed at Foundation tier. Including density at Higher tier. Other measures will be defined in the question.
5	Understand and use bearings.		
6	Measure and draw lines and angles.		
A2.A	**Algebra**		
1	Set up, and solve simple equations		A1 (A2), M1 (A4), M2 (A3)
2	Use the conventions for coordinates in the plane and plot points in all four quadrants.		M1 (A10), M2 (A7)
3	Recognise and plot equations that correspond to straight-line graphs in the coordinate plane.		M1 (A11)
4	Find approximate solutions of equations using graphical methods and systematic trial and improvement.		
5	Find and interpret gradients and intercepts of straight line graphs in practical contexts.		
6	Construct linear functions from real-life problems and plot their corresponding graphs.	Extend to quadratic and other functions.	
7		Interpret the gradient at a point on a curve as the rate of change.	
8	Recognise and use graphs that illustrate direct proportion.	Extend to inverse proportion.	Including distance-time graphs

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
9	Discuss, plot and interpret graphs (which may be non-linear) modelling real situations, including journeys / travel graphs.	Including periodic graphs.	
10	Calculate areas under graphs consisting only of straight lines and interpret the result.	Extend to estimates of areas under curves.	
A2.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.		M2 (G1)
2	Understand and use the angle properties of parallel and intersecting lines, triangles and quadrilaterals.		Candidates should know the names and properties of isosceles, equilateral, right-angled and scalene triangles. M2 (G2)
3	Recall the properties and definitions of special types of quadrilateral, including square, rectangle, parallelogram, trapezium, kite and rhombus.		M2 (G3)
4	Recognise reflection and rotation symmetry of 2D shapes.		M2 (G4)
5	Understand congruence and similarity, including the relationship between lengths, in similar figures.	Including the relationship between areas and volumes of similar shapes.	M2 (G13)
6	Use Pythagoras' theorem in 2D.	Extend to 3D.	M2 (G14)
7	Distinguish between centre, radius, chord, diameter, circumference, tangent, arc, sector and segment.		M2 (G16)
8		Use the trigonometric ratios to solve 2D and 3D problems.	Sine and cosine rule will not be assessed in this unit. M2 (G15)
9	Use 2D representations of 3D shapes.		
10	Use and interpret maps and scale drawings.		

Unit 2	Core (Foundation and Higher tiers)	Higher tier only	Notes
11	Draw triangles and other 2D shapes using a ruler, pair of compasses and protractor.		
12	Use straight edge and a pair of compasses to do constructions.		
13	Construct loci.		
14	Find circumferences of circles and areas enclosed by circles.		M2 (G17)
15	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. M2 (G18)
16	Calculate volumes of right prisms and of shapes made from cubes and cuboids.		Including cylinders. M2 (G20)
17		Solve mensuration problems involving more complex shapes and solids.	Including cones and spheres. Including compound shapes and frustums M2 (G21)

3d Functional elements

The functional elements of mathematics are embedded in this specification.

The following percentages of questions will assess the functional elements of the subject

- 20-30% of questions on the Higher tier and
- 30-40% of questions on the Foundation tier.

The term 'functional' should be considered in the broad sense providing learners with the skills and abilities they need to take an active and responsible role in their communities, everyday life, the workplace and educational settings. Functional mathematics requires learners to use mathematics effectively in a wide range of contexts.

The functional elements focus on the following key processes.

Representing

This is about understanding 'real world' problems and selecting the mathematics to solve them.

Analysing

This is about applying a range of mathematics within realistic contexts.

Interpreting

This is about communicating and justifying solutions and linking solutions back to the original context of the problem.

Within this specification, there will be opportunities in both units to demonstrate the functional elements of mathematics. A question may assess just one of the above key processes or may cover all three but the style of question will be appropriate to a GCSE examination. Questions assessing functional elements are more likely to cover topic areas that particularly lend themselves to contextualisation such as statistics, number and measures, but will not be restricted to any specific content areas.

Further, questions addressing the functional elements can target any of the three assessment objectives described in section 4b of this specification.

Within AO1, straightforward questions will be asked set within realistic contexts. The mathematics required will generally be clear to candidates and any interpretation of the result will be simple.

Within AO2, candidates will be expected to choose the mathematics and/or select the steps required to reach a solution to questions set within realistic contexts. They may also be required to interpret or communicate the result with reference to the context.

Within AO3, candidates will be expected to solve problems using mathematical skills in context, combining the skills of representing, analysing and interpreting to produce a solution. Contexts may be novel or unfamiliar.

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, including statistics, in helping to solve problems in the real world. Specifications should prepare learners to make informed decisions about the use of technology, the management of money, further learning opportunities and career choices and to help them to function as informed citizens

GCSE courses based on this specification must enable candidates to:

- develop knowledge, skills and understanding of mathematical and statistical methods, techniques and concepts. Select and apply appropriate mathematics and statistics in everyday situations and contexts from the real-world
- use mathematics to represent, analyse and interpret financial information
- understand and use the statistical problem solving cycle
- acquire and use strategies for problem solving and modelling in context, understanding that models may need refining and that there may be more than one way to solve a problem
- interpret mathematical results and draw and justify conclusions that are relevant to the context
- communicate mathematical information in a variety of forms.

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 generate strategies 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 A1	Unit A2	
AO1	20 - 25	20 - 25	40 - 50
AO2	15 - 20	15 - 20	30 -40
AO3	7 - 13	7 - 13	15 - 25
Overall weighting of units (%)	50	50	

4c National Criteria

This specification is in line with the following.

- The framework for piloting for GCSE Applications of 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 A1	Unit A2	
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 – 93701F; 93701H

Unit 2 – 93702F; 93702H

GCSE certification – 9372

A separate entry is need for each of the two units. In addition, an entry must be submitted for the overall subject award, 9372.

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 Applications of 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 Methods in 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.

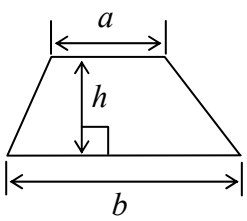
Candidates' grades are based on the work they submit for assessment.

Appendices

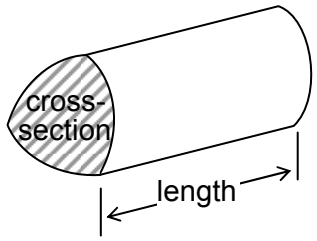
A Formulae Sheets

Foundation Tier Unit A2

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

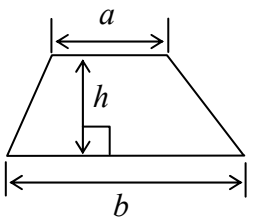


Volume of prism = area of cross-section × length

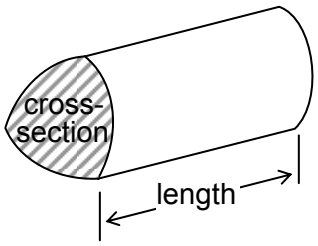


Higher Tier Unit A2

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

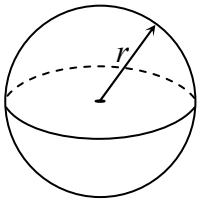


Volume of prism = area of cross-section × length



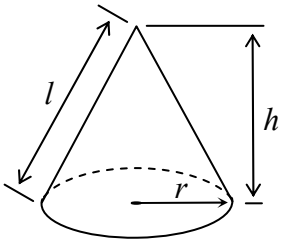
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



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

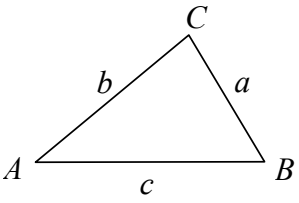
Curved surface area of cone = $\pi r l$



In any triangle ABC

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

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



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 Applications of Mathematics is intended to be taken alongside Methods in 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 A1 of this specification and GCSE Statistics.

Candidates preparing for this specification will cover the functional elements of mathematics but will not be awarded a qualification for Functional mathematics.

The Functional Skills Certificate in Mathematics is available as a separate stand-alone qualification.

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.qcda.gov.org.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 Applications of Mathematics (Pilot)

Qualification Accreditation Number: 500/7931/1

Every specification is assigned a national classification code indicating the subject area to which it belongs. The classification code for this specification is 2210.

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

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