



# Level 2 Extended Mathematics Certificate

## Specification

Pearson Edexcel Level 2 Extended Mathematics Certificate (7M20)

*First teaching from September 2024*

*First certification June 2025*

**Issue 2**

## **About Pearson**

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## Summary of Pearson Edexcel Level 2 Extended Mathematics Certificate (7M20) Specification.

### Issue 2 changes

Summary of changes made between previous issue and this current issue	Page of PDF
Update to 'Get help and support' section	3
Specification point A2.1 has been amended to include polynomial division	8
In <i>Additional guidance section A2.3</i> addition of $(x)$ after "g" in the last sentence.	9
The first bullet point of the <i>Progression section</i> has been updated	20
The Trapezium rule has been added to the list of formulae in <i>Appendix 1: Mathematical formulae</i> that will be provided for students	22

If you need further information on these changes or what they mean, contact us via our website at:

[qualifications.pearson.com/en/support/contact-us.html](https://qualifications.pearson.com/en/support/contact-us.html)

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# 1 Introduction

## Why choose Pearson Edexcel Extended Mathematics Certificate?

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We have listened to and engaged with all areas of the mathematics subject community, including further education. We have used the feedback to develop a qualification that will enable your students to deepen their knowledge in mathematics at Level 2 and develop mathematical skills which will allow them to succeed in their chosen pathway.

**Dive deeper into maths** – our qualification has been designed to challenge your students to dive deeper into key concepts, to encourage their enjoyment of maths and help them to achieve their potential.

**Build the knowledge needed for further study** – our qualification provides relevant, foundational knowledge that builds upon what students already know, and eases the transition to KS5 qualifications, such as qualifications in Maths, Geography, Science or Psychology.

**Based on research and teacher insight** – we have listened to your feedback and have created a qualification that suits your needs in the classroom, with key concepts and topics that make sense for your students at this stage of their learning journey.

**Effortless switching** – switch easily with support from our dedicated maths subject team, giving you the confidence to get started with us straight away.

**Unbeatable support** – the support you know and trust from Pearson Edexcel. With a large number of resources available throughout the year on our Qualifications website, we will ensure that you have the support you need to teach this qualification.

# Supporting you in planning and implementing this qualification

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## Planning

- Our **Course Guide** gives you an overview of the new Extended Mathematics Certificate qualification to help you to get to grips with the content and assessment, and to help you understand what this means for you and your students.
- CPD to help you to get to grips with delivering the content to your students.
- We will give you an editable **course planner** and **scheme of work** that you can adapt to suit your department.
- **Our mapping documents** highlight links to higher GCSE mathematics and GCE mathematics.

## Teaching and learning

- There will be lots of free teaching and learning support to help you deliver the new qualifications, including:
  - suggested resources lists,
  - practice and topic papers,
  - student facing videos and guides,
  - materials for your options evenings.

## Preparing for exams

We will also provide a range of resources to help you prepare your students for the assessments, including:

- additional assessment materials to support formative assessments and mock exams,
- themed papers,
- practice papers,
- marked exemplars of student work with examiner commentaries.

## ResultsPlus

ResultsPlus provides the most detailed analysis available of your students' exam performance. It can help you identify the topics and skills where further learning would benefit your students.

## Get help and support

We have over 20,000 free resources across all Pearson Edexcel maths qualifications; including past papers, mark schemes, examiner reports and grade boundaries. We also have teaching and learning resources as well as offering both free and paid for high quality CPD. Learn more at [qualifications.pearson.com](https://qualifications.pearson.com)

Our subject experts will ensure you receive the help and guidance you need to deliver the course. Contact us at [teachingmaths@pearson.com](mailto:teachingmaths@pearson.com)

## Qualification at a glance

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### Content and assessment overview

The Pearson Edexcel Level 2 Extended Mathematics Certificate consists of two externally examined papers.

Students must complete both assessments in the same assessment series.

There is one assessment series available each year in May/June.

The first assessment series is May/June 2025.

The assessments will cover the following five content areas:

1. Number
2. Algebra
3. Ratio, proportion and rates of change
4. Geometry
5. Probability

Questions will be set in both mathematical and non-mathematical contexts.

Each paper will cover all Assessment Objectives, in the percentages outlined. (See 'Assessment Objectives' for more information.)

A list of formulae that may be given in the examination (as part of the relevant question) is provided in Appendix 1 'Mathematical formulae.'

The qualification will be graded and certificated on a four-grade scale, pass, merit, distinction and distinction\* using the total mark across both papers where distinction\* is the highest grade. Individual papers are not graded.

## Paper 1: Non-calculator paper

#Paper code: (7M20/01)

- Duration: 1 hour and 15 minutes
- Number of marks: 60
- Percentage of qualification: 50%
- Written paper with a range of question types.
- The paper will include questions that target mathematics at Level 2.
- Students must answer all questions.
- Marks may be allocated for sketching a diagram.
- ##Any part of the content may be assessed
- No calculator is allowed.

## Paper 2: Calculator

#Paper code: (7M20/02)

- Duration: 1 hour and 15 minutes
- Number of marks: 60
- Percentage of qualification: 50%
- Written paper with a range of question types.
- The paper will include questions that target mathematics at Level 2.
- Students must answer all questions.
- ##Any part of the content may be assessed.
- Calculators are allowed.

#See Appendix 3: 'Codes' for a description of this code and all other codes relevant to this qualification.

##A minimum of 50% of the content across Paper 1 and Paper 2 in any given examination series will assess content from **Algebra**.

Content from **Number, Ratio, Geometry** and **Probability** will also be assessed on either Paper 1 and/or Paper 2 in any given examination series.

## **Synoptic assessment**

Synoptic assessment requires students to work across different parts of a qualification and to show their accumulated knowledge and understanding of a topic or subject area.

Synoptic assessment enables students to show their ability to combine their skills, knowledge and understanding with breadth and depth of the subject.

Both papers assess synoptically.

## **Sample assessment materials**

Sample papers and mark schemes for both papers can be found in the Pearson *Edexcel Level 2 Extended Mathematics Certificate Sample Assessment Materials (SAMs)* document.

## 2 Subject content and assessment information

### Qualification aims and objectives

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The aims and objectives of this qualification are to enable students to

- develop fluent knowledge, skills and understanding of mathematical methods and concepts,
- acquire, select and apply mathematical techniques to solve problems,
- reason mathematically, make deductions and inferences, and draw conclusions,
- comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.
- develop a deeper understanding of key mathematics concepts at Level 2
- provide relevant, foundational knowledge that builds upon GCSE Mathematics skills and knowledge.
- prepare for further study.

### Qualification sizing

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Guided Learning Hours (GLH) are made up of activities that are completed by the learner under the direct instruction or supervision of a teacher, whether through physical presence or electronic means. The GLH for this qualification is 60 hours.

Total Qualification Time (TQT) is made up of the GLH plus all other time taken in preparation and study and is an estimate of the total number of hours it would take an average learner to achieve and demonstrate the necessary level of attainment to be awarded with a qualification but not under the direct supervision of a teacher. The TQT for this qualification is 121 hours.

# Subject Content

The content of the Pearson Edexcel Extended Mathematics Certificate is based on the content of GCSE Mathematics qualification. The content draws on some of the Higher tier GCSE Mathematics content in greater depth and extends it.

Ref	Level 2 Extended Maths Certificate Content	Additional Guidance	GCSE and A Level References
<b>1 Number</b>			
<b>N1.1</b>	Calculate with integer, negative and fractional indices Understand the term "real numbers"	This can include expressions that link with algebra and the solving of linear equations	GCSE – N7 A-level – 2.1
<b>N1.2</b>	Calculate exactly with surds; simplify surd expressions involving squares, (e.g. $\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$ ) and rationalise denominators	This can include complex expressions where the denominator requires simplifying prior to rationalisation	GCSE – N8 A-level – 2.2

<b>2 Algebra</b>			
<b>A2.1</b>	Simplify and manipulate algebraic expressions (including those involving surds and algebraic fractions) by: <ul style="list-style-type: none"> <li>collecting like terms</li> <li>multiplying a single term over a bracket</li> <li>expanding products of two or more binomials</li> <li>factorising quadratic expressions of the form <math>ax^2 + bx + c</math>, including the difference of two squares;</li> <li>factorising cubic expressions of the form <math>ax^3 + bx^2 + cx + d</math></li> <li>simplifying expressions involving sums, products and powers, including the laws of indices</li> </ul>	This can include the use of Pascal's Triangle to expand polynomials, and the use of the factor theorem (but not the remainder theorem) and polynomial division. Pascal's Triangle, or the relevant row will be provided	GCSE – A4 A-level – 2.6

<b>2 Algebra</b>			
<b>A2.2</b>	Use algebra to support and construct proofs	<p>Students need to understand the importance of clear structured algebra when working with proofs.</p> <p>Students should be able to write a general form for an integer (<math>n</math>), and even number (<math>2n</math>) and an odd number (<math>2n + 1</math>) or (<math>2n - 1</math>)</p> <p>Methods of proof can include, proof by deduction, proof by exhaustion and proof by counter example. Proof by contradiction will not be assessed.</p>	GCSE – A6 A-level – 1.1
<b>A2.3</b>	Identify a function's features including the asymptotes, domain and range. Interpret the 'inverse function'; interpret the succession of two functions as a 'composite function' (the use of formal function notation is expected)	<p>Given a function, find the inverse function, may include quadratic functions.</p> <p>Given <math>f(x)</math> and <math>g(x)</math> find <math>fg(x)</math> or <math>gf(x)</math></p> <p>Understanding of domain and range of functions will be assessed.</p> <p>e.g. For <math>f(x) = \frac{4}{3-x}</math></p> <p>what value must be excluded from the domain.</p> <p>For <math>g(x) = x^2</math> write the domain of <math>g(x)</math></p>	GCSE – A7 A-level – 2.8
<b>A2.4</b>	Identify parallel and perpendicular linear lines in the forms $y = mx + c$ , $ax + by + c = 0$ , $ax + by = c$ and $y - y_1 = m(x - x_1)$	<p>Make the link between perpendicular lines with the radius and tangent of a circle.</p> <p>Students should be able to use straight line models in a variety of contexts, including Linear Programming.</p>	GCSE – A9 A-level – 3.1
<b>A2.5</b>	Identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically and turning points by completing the square	<p>Completing the square where the coefficient of <math>x^2</math> is not 1 and the coefficient of <math>x</math> is not even.</p> <p>Understand algebraic perfect squares, <math>a^2 + 2ab + b^2</math></p> <p>Understand the links between the discriminant of a quadratic function having no real roots, equal real roots, and two distinct roots and how that can be depicted graphically. (Tangent with one real root)</p>	GCSE – A11 A-level – 2.3

<b>2 Algebra</b>			
<b>A2.6</b>	Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic and quartic functions, the reciprocal function $y = a/x$ and $y = a/x^2$ where $x \neq 0$ and $a$ is an integer, exponential functions $y = k^x$ and the trigonometric functions (with arguments in degrees) e.g. $y = \sin x$ , $y = \cos(x + 30)$ and $y = \tan 2x$ for angles of any size	Key points and intersections will need to be identified in sketches including asymptotes.  For trigonometric graphs students should understand their graphs, symmetries and periodicity.	GCSE – A12 A-level – 2.7
<b>A2.7</b>	Sketch transformations of a given function	This will include stretches in both directions, $y = af(x)$ , $y = f(x) + a$ , $y = f(x + a)$ , $y = f(ax)$ and combinations of these.	GCSE – A13 A-level – 2.9
<b>A2.8</b>	Plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration	e.g. population growths, radioactive decay, linear programming, variable acceleration. Understand the difference between the graphs of $y = a^x$ when $0 < a < 1$ and $a > 1$	GCSE – A14 A-level – 6.1
<b>A2.9</b>	Calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts (this does not include calculus)	Interpreting rate of change by drawing, and finding the gradient of, a suitable tangent to the curve.  This will include specific use of the Trapezium Rule for estimating area under a curve.	GCSE – A15
<b>A2.10</b>	Recognise and use the equation of a circle; find the equation of a tangent to a circle at a given point.  Recognise, sketch and use the equation of a circle	Understand the coordinate geometry of the circle, including using the equation in the form, $(x - a)^2 + (y - b)^2 = r^2$ and be able to complete the square to find the centre and radius of a circle.	GCSE – A16 A-level – 3.2

<b>2 Algebra</b>			
<b>A2.11</b>	Solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph	This can be extended, for example, to solving trigonometric equations such as $3\sin x + 2 = 3$ and those that give no solutions e.g. $3 - 0.5\cos x = 2$ Students should be able to use straight line models in a variety of contexts, including Linear Programming where they should understand the terms 'Objective Function' and 'feasible region'.	GCSE – A17
<b>A2.12</b>	Solve quadratic equations (including those that require rearrangement) algebraically by factorising, by completing the square and by using the quadratic formula	This can include solving 'hidden' quadratics, e.g. Solve quadratic equations with $x^4$ and $x^2$ or $2^{2x}$ and $2^x$ or solving equations such as $2\sin^2 x + 3\sin x + 1 = 0$ for $0^\circ \leq x \leq 360^\circ$	GCSE – A18 A-level – 2.3
<b>A2.13</b>	Solve two simultaneous equations in two variables (linear/linear or linear/quadratic) algebraically or graphically (including those that require rearrangement)	There will be a greater emphasis on solving by substitution or graphically.	GCSE – A19 A-level – 2.4
<b>A2.14</b>	Solve linear inequalities in one or two variable(s), and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph	This may be assessed in context, e.g. linking to Linear programming and profit and loss.	GCSE – A22 A-level – 2.5

<b>3 Ratio, proportion and rates of change</b>			
<b>R3.1</b>	Interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts (this does not include calculus)		GCSE – R15

<b>4 Geometry</b>			
<b>G4.1</b>	Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results	This can be tested by giving a partial proof to be completed or a complete proof of the standard circle theorems.	GCSE – G10 A-level – 3.2
<b>G4.2</b>	Know the formulae for: Pythagoras' theorem $a^2 + b^2 = c^2$ , and the trigonometric ratios; apply them to find angles and lengths in right-angled triangles and, where possible, general triangles in two and three dimensional figures		GCSE – G20
<b>G4.3</b>	Know the exact values of $\sin \theta$ and $\cos \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and $90^\circ$ ; know the exact value of $\tan \theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and $60^\circ$	Proof of these values using triangles may be tested.	GCSE – G21
<b>G4.4</b>	Know and apply the sine rule and cosine rule, to find unknown lengths and angles in two and three dimensional figures	Proof of the sine rule using Pythagoras may be tested.	GCSE – G22
<b>G4.5</b>	Know and apply $\text{Area} = \frac{1}{2}ab\sin C$ to calculate the area, sides or angles of any triangle	This can include working in 3D.	GCSE – G23 A-level – 5.1
<b>G4.6</b>	Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; use vectors to construct geometric arguments and proofs	Understand and use position vectors; calculate the distance between two points represented by position vectors. Understand the notation $AB$ .	GCSE – G25 A-level – 10.1 / 10.3 / 10.4 / 10.5

<b>5 Probability</b>			
<b>P5.1</b>	Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams	Understand the notation $n(B)$	GCSE – P6
<b>P5.2</b>	Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions, e.g. for two independent events $A$ and $B$ $P(A \text{ and } B) = P(A) \times P(B)$	Strong links to algebra and solving linear and quadratic equations. Understand the notation $P(A)$	GCSE – P8
<b>P5.3</b>	Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams	Strong links to algebra and solving linear and quadratic equations	GCSE – P9

## Assessment Objectives

	Percentage of qualification
<p><b>AO1 Use and apply standard techniques</b></p> <p>Students should be able to:</p> <ul style="list-style-type: none"> <li>accurately recall facts, terminology and definitions</li> <li>use and interpret notation correctly</li> <li>accurately carry out routine procedures or set tasks requiring multi-step solutions.</li> </ul>	40%
<p><b>AO2 Reason, interpret and communicate mathematically</b></p> <p>Students should be able to:</p> <ul style="list-style-type: none"> <li>make deductions, inferences and draw conclusions from mathematical information</li> <li>construct chains of reasoning to achieve a given result</li> <li>interpret and communicate information accurately</li> <li>present arguments and proofs</li> <li>assess the validity of an argument and critically evaluate a given way of presenting information.</li> </ul> <p><i>Where problems require students to ‘use and apply standard techniques’ or to independently ‘solve problems’ a proportion of those marks should be attributed to the corresponding Assessment Objective.</i></p>	30%

	Percentage of qualification
<p><b>AO3 Solve problems within mathematics and in other contexts</b></p> <p>Students should be able to:</p> <ul style="list-style-type: none"> <li>• translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes</li> <li>• make and use connections between different parts of mathematics</li> <li>• interpret results in the context of the given problem</li> <li>• evaluate methods used and results obtained</li> <li>• evaluate solutions to identify how they may have been affected by assumptions made.</li> </ul> <p><i>Where problems require students to ‘use and apply standard techniques’ or to ‘reason, interpret and communicate mathematically’ a proportion of those marks should be attributed to the corresponding Assessment Objective.</i></p>	30%

# 3 Administration and general information

## Entries

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Details of how to enter students for the examinations for this qualification can be found in our *UK Information Manual*. A copy is made available to all examinations officers and is available on our website: [qualifications.pearson.com](https://www.pearson.com/qualifications)

## Access arrangements, reasonable adjustments, special consideration and malpractice

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Equality and fairness are central to our work. Our equality policy requires all students to have equal opportunity to access our qualifications and assessments, and our qualifications to be awarded in a way that is fair to every student.

We are committed to making sure that:

- students with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to students who do not share that characteristic
- all students achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

## Language of assessment

Assessment of this qualification will be available in English. All student work must be in English.

## Access arrangements

Access arrangements are agreed before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

The intention behind an access arrangement is to meet the particular needs of an individual student with a disability, without affecting the integrity of the assessment. Access arrangements are the principal way in which awarding bodies comply with the duty under the Equality Act 2010 to make 'reasonable adjustments'.

Access arrangements should always be processed at the start of the course. Students will then know what is available and have the access arrangement(s) in place for assessment.

## Reasonable adjustments

The Equality Act 2010 requires an awarding organisation to make reasonable adjustments where a person with a disability would be at a substantial disadvantage in undertaking an assessment. The awarding organisation is required to take reasonable steps to overcome that disadvantage.

A reasonable adjustment for a particular person may be unique to that individual and therefore might not be in the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, including:

- the needs of the student with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the student with the disability and other students.

An adjustment will not be approved if it involves unreasonable costs to the awarding organisation, or affects timeframes or the security or integrity of the assessment. This is because the adjustment is not 'reasonable'.

## Special consideration

Special consideration is a post-examination adjustment to a student's mark or grade to reflect temporary injury, illness or other indisposition at the time of the examination/assessment, which has had, or is reasonably likely to have had, a material effect on a candidate's ability to take an assessment or demonstrate their level of attainment in an assessment.

## Further information

Please see our website for further information about how to apply for access arrangements and special consideration.

For further information about access arrangements, reasonable adjustments and special consideration, please refer to the JCQ website: [www.jcq.org.uk](http://www.jcq.org.uk).

## Malpractice

### Candidate malpractice

Candidate malpractice refers to any act by a candidate that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

Candidate malpractice in examinations **must** be reported to Pearson using a *JCQ Form M1* (available at [www.jcq.org.uk/exams-office/malpractice](http://www.jcq.org.uk/exams-office/malpractice)). The form should be emailed to [candidatemalpractice@pearson.com](mailto:candidatemalpractice@pearson.com). Please provide as much information and supporting documentation as possible. Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice constitutes staff or centre malpractice.

### Staff/centre malpractice

Staff and centre malpractice includes both deliberate malpractice and maladministration of our qualifications. As with candidate malpractice, staff and centre malpractice is any act that compromises or seeks to compromise the process of assessment or which undermines the integrity of the qualifications or the validity of results/certificates.

All cases of suspected staff malpractice and maladministration **must** be reported immediately, before any investigation is undertaken by the centre, to Pearson on a *JCQ Form M2(a)* (available at [www.jcq.org.uk/exams-office/malpractice](http://www.jcq.org.uk/exams-office/malpractice)). The form, supporting documentation and as much information as possible should be emailed to [pqsmalpractice@pearson.com](mailto:pqsmalpractice@pearson.com). Note that the final decision regarding appropriate sanctions lies with Pearson.

Failure to report malpractice itself constitutes malpractice.

More detailed guidance on malpractice can be found in the latest version of the document *General and Vocational Qualifications Suspected Malpractice in Examinations and Assessments Policies and Procedures*, available at [www.jcq.org.uk/exams-office/malpractice](http://www.jcq.org.uk/exams-office/malpractice).

## Awarding and reporting

This Level 2 qualification will be graded and certificated on a four-grade scale from pass to distinction\* using the total subject mark. Individual papers are not graded.

Students whose level of achievement is below the minimum judged by Pearson to be of sufficient standard to be recorded on a certificate will receive an unclassified U result.

The first certification opportunity for this qualification will be 2025.

## Student recruitment and progression

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Pearson follows the JCQ policy concerning recruitment to our qualifications in that:

- they must be available to anyone who is capable of reaching the required standard
- they must be free from barriers that restrict access and progression
- equal opportunities exist for all students.

## Prior learning and other requirements

There are no prior learning or other requirements for this qualification.

Students who would benefit most from studying this qualification are likely to be studying towards a Level 2 qualification such as a GCSE in Mathematics.

## Progression

Students can progress from this qualification to:

- Further Mathematical Study e.g. AS/A level Mathematics, AS/A level Further Mathematics, A level Statistics, International A level Mathematics/Further Mathematics/Mechanics/Statistics, Advanced Extension Award, Level 3 Core Maths, Edexcel Award in Mathematics Algebra Level 3 etc.
- Other A level subjects e.g. Psychology, Biology, Chemistry, Physics, Geography, Business, Economics etc.
- BTEC Level 3 qualifications which contain level 3 Mathematics content e.g. Level 3 Applied Science etc.

# Appendices

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# Appendix 1: Mathematical formulae

The following formulae will be provided for students within the relevant examination questions.

## *Perimeter, area, surface area and volume formulae*

Where  $r$  is the radius of the sphere or cone,  $l$  is the slant height of a cone and  $h$  is the perpendicular height of a cone:

Curved surface area of a cone =  $\pi rl$

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

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

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

The trapezium rule

$$\text{Area} \approx \frac{1}{2}h[y_0 + 2(y_1 + y_2 + \dots + y_{n-1}) + y_n]$$

where  $h$  is the width of each strip,  $y_0, y_1, y_2, \dots, y_{n-1}, y_n$  are the values of  $y$  for each value of  $x$  used, and  $n$  is the number of strips with equal width.

# Appendix 2: Transferable skills

## The need for transferable skills

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In recent years, higher education institutions and employers have consistently flagged the need for students to develop a range of transferable skills to enable them to respond with confidence to the demands of undergraduate study and the world of work.

The Organisation for Economic Co-operation and Development (OECD) defines skills, or competencies, as ‘the bundle of knowledge, attributes and capacities that can be learned and that enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning.’<sup>[1]</sup>

To support the design of our qualifications, the Pearson Research Team selected and evaluated seven global 21st-century skills frameworks. Following on from this process, we identified the National Research Council’s (NRC) framework as the most evidence-based and robust skills framework. We adapted the framework slightly to include the Program for International Student Assessment (PISA) ICT Literacy and Collaborative Problem Solving (CPS) Skills.

The adapted National Research Council’s framework of skills involves:<sup>[2]</sup>

### Cognitive skills

- **Non-routine problem solving** – expert thinking, metacognition, creativity.
- **Systems thinking** – decision making and reasoning.
- **Critical thinking** – definitions of critical thinking are broad and usually involve general cognitive skills such as analysing, synthesising and reasoning skills.
- **ICT literacy** – access, manage, integrate, evaluate, construct and communicate.<sup>[3]</sup>

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<sup>[1]</sup> OECD – *Better Skills, Better Jobs, Better Lives* (OECD Publishing, 2012)

<sup>[2]</sup> Koenig J A, National Research Council – *Assessing 21st Century Skills: Summary of a Workshop* (National Academies Press, 2011)

<sup>[3]</sup> PISA – *The PISA Framework for Assessment of ICT Literacy* (2011)

## Interpersonal skills

- **Communication** – active listening, oral communication, written communication, assertive communication and non-verbal communication.
- **Relationship-building skills** – teamwork, trust, intercultural sensitivity, service orientation, self-presentation, social influence, conflict resolution and negotiation.
- **Collaborative problem solving** – establishing and maintaining shared understanding, taking appropriate action, establishing and maintaining team organisation.

## Intrapersonal skills

- **Adaptability** – ability and willingness to cope with the uncertain, handling work stress, adapting to different personalities, communication styles and cultures, and physical adaptability to various indoor and outdoor work environments.
- **Self-management and self-development** – ability to work remotely in virtual teams, work autonomously, be self-motivating and self-monitoring, willing and able to acquire new information and skills related to work.

Transferable skills enable young people to face the demands of further and higher education, as well as the demands of the workplace, and are important in the teaching and learning of this qualification. We will provide teaching and learning materials, developed with stakeholders, to support our qualifications.

## Appendix 3: Codes

Type of code	Use of code	Code
Regulated Qualifications Framework (RQF) codes	<p>Each qualification title is allocated an Ofqual Regulated Qualifications Framework (RQF) code.</p> <p>The RQF code is known as a Qualification Number (QN). The QN will appear on students' final certification documentation.</p>	<p>The QN for this qualification is:</p> <p>610/3322/4</p>
Subject codes	<p>The subject code is used by centres to enter students for a qualification. Centres will need to use the entry codes only when claiming students' qualifications.</p>	7M20
Paper/Component codes	<p>These codes are provided for reference purposes. Students do not need to be entered for individual components/papers.</p>	<p>Paper 1: Non-calculator 7M20/01</p> <p>Paper 2: Calculator 7M20/02</p>

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