



Level 3 Certificate in Mathematics in Context (7MC0)

Enhanced Content Guidance – Version 1

To be used with Issue 5 of the specification

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Introduction

The purpose of this document is to provide further guidance for specific content areas within the **Pearson Edexcel Level 3 Certificate in Mathematics in Context** specification.

This document is to be used alongside the Pearson Edexcel Level 3 Certificate in Mathematics in Context specification found on our website:

<https://qualifications.pearson.com/en/qualifications/edexcel-mathematics-in-context/mathematics-in-context.html>

The additional guidance can be found in the final column of the table, 'Additional content guidance'. Where appropriate, we have included examples of questions to add further clarity, however the lists of examples provided are not exhaustive.

Please note that the additional guidance provided here does not change or impact upon the specification.

Calculator Guidance

Use of calculators to answer questions **without** showing working is allowed, unless working is specifically requested.

However, we do not recommend this, as it is a high-risk strategy. One arithmetic error could lead to no marks being awarded as all the examiners will see is an inaccurate answer. By showing some working out this could allow examiners to award some intermediate marks for method that has resulted in an incorrect final answer, in line with the mark scheme.

General Guidance

Interpretation in context is a requirement of this specification. Simple interpretations, without reference to context, may only be awarded partial marks.

Further guidance and examples

GCSE Mathematics

Only GCSE Mathematics content that is **common** across the different exam boards will be assessed in this specification.

For any references to the GCSE Mathematics please refer to the **Department for Education – Subject content and assessment objectives for GCSE in mathematics**. Visit <https://www.gov.uk/government/publications/gcse-mathematics-subject-content-and-assessment-objectives> for an overview of the content.

Individual exam board specification documents provide further detail, please refer to the [Pearson Edexcel GCSE \(9-1\) Mathematics specification](#).

The following documents outline the key differences between the Pearson Edexcel specification and the other exam boards.

[GCSE Maths Pearson Edexcel Differences with AQA](#)

[GCSE Maths Pearson Edexcel Differences with OCR](#)

Question examples

For examples of past paper questions by topic area, please refer to ExamWizard. Visit

<https://qualifications.pearson.com/en/support/Services/examwizard.html> for more information.

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
Application of Statistics		
A1	Infer properties of populations or distributions from a sample, while knowing the limitations of sampling	<p>Usually, questions will be asked about general characteristics of populations and the difference between populations and samples.</p> <p>Limitations may consider concepts such as the bias of data and sample size and their influence on statistical analysis.</p> <p>Knowledge of stratified sampling is not required.</p>
A2	Interpret and construct tables and line graphs for time series data; calculate, interpret and use moving averages	Questions may ask for construction of graphs, finding moving averages and interpretation including trends, interpolation and extrapolation.
A3	Construct and interpret diagrams for grouped discrete data and continuous data, e.g. histograms with equal and unequal class intervals and cumulative frequency graphs, and use them appropriately	<p>As real life data is used an exhaustive list of diagrams is not possible. Graphs could include different types that are used within the media.</p> <p>In a cumulative frequency graph points may be joined by line segments or curves. The graph should cover the data set.</p>

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
A4	Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation, including box plots	<p>This is “including box plots” and may include the identification and consideration of outliers. If students are required to calculate, to identify outliers, the formula will be stated in the question. For example, below lower quartile -1.5 IQR and above upper quartile $+1.5$ IQR</p> <p>Students are expected to be familiar with the diagrams within the GCSE Mathematics foundation content.</p> <p>The ability to physically draw a pie chart will not be required but calculating the size of sectors may be required.</p> <p>Other diagrams may also be used, including different types of graphs that are used within the media.</p>
A5	Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency, including quartiles, inter-quartile range, calculate and use variance and standard deviation	<p>Central tendency covers the knowledge of mean, median and mode including estimations. Calculations may be expected.</p> <p>The interpretation of a range of diagrams or written reports may be required to find or estimate any of the statistical values listed in this section.</p> <p>Interpretation in context is a requirement of this specification. Simple interpretations, without reference to context, may only be awarded partial marks.</p>
A6	Recognise correlation and know that it does not indicate causation	This may require use of diagrams or statistical values.

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
A7	Apply and interpret explanatory (independent) and response (dependent) variables, interpolate and extrapolate apparent trends while knowing the dangers of doing so	
A8	Draw estimated lines of best fit and make predictions; use and interpret the product moment correlation coefficient, recognising its limitations	<p>Lines of best fit should be straight but may be drawn by eye if a simple estimation is required.</p> <p>The formula for PMCC is given in the source booklet and should be referred to if required. Interpretation may be either simple or in context.</p> <p>Limitations may also be requested in context.</p>
A9	Use, apply and interpret linear regression; calculate the equation of a linear regression line using the method of least squares (candidates may be asked to draw this regression line on a scatter diagram)	<p>Formulae can be found in the source booklet.</p> <p>Use of substitution into the equations of a line of regression may be assessed. This may overlap with elements of the Linear Programming content area.</p> <p>Comparisons may be requested and should usually be supported by calculations to gain full credit when justification is required.</p>

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
A10	Use, apply and interpret Spearman's rank; calculate Spearman's rank correlation coefficient and use it as a measure of agreement or for comparisons of the degree of correlation (tied ranks may be tested in the examination papers).	Appropriate formulae can be found in the source booklet. Some of the data, usually provided in a table, will already be partially ranked. Students may use this ranking as an aid or fully re-rank the data. Both approaches will be given credit.
Probability		
P1	Understand and demonstrate that empirical unbiased samples tend towards theoretical probability distributions, as sample size increases	Students may be asked to consider the sample size for the reliability of outcomes, including the probability of given events.
P2	Enumerate sets and combinations of sets systematically using tree diagrams	Tree diagrams and Venn diagrams are not restricted to only two events.
P3	Calculate the probability of independent and dependent combined events, including sampling with and without replacement, using tree diagrams and other representations, Venn diagrams, sum and product laws	For calculating probabilities, a wide range of diagrams and information may need to be interpreted. These include the list given but note the phrase 'other representations' so tables or diagrams or written data sources etc may be used.
P4	Calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams	For calculating probabilities, a wide range of diagrams and information may need to be interpreted.

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
P5	Understand, use and interpret probability notation, its application to Venn diagrams, exclusive and complementary events, independence of two events and conditional probability	Common set and probability notation may be used, including intersections, unions and complements. Students may need to write down notation or interpret notation and again interpretation in context may be required.
P6	Understand, interpret and use appropriately the following formulae: $P(A') = 1 - P(A)$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cap B) = P(A) \times P(B A)$ $P(B A) = P(B) \text{ and } P(A B) = P(A)$ $P(A \cap B) = P(A) \times P(B)$	Students need to be able to recall, understand and use this formal notation.
P7	Understand and interpret risk; the probability of something happening multiplied by the resulting cost or benefit if it does; comparison of levels of risk; application of risk to real-life contexts such as finance, insurance and trading.	This may be set in a variety of contexts. Some questions will be set in a problem-solving nature.

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
Linear Programming		
LP1	Translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution	<p>‘Situations’ may be described in words or given diagrammatically.</p> <p>The distinction between equations, formulae, expression and inequalities (LP6) are a requirement of this specification.</p> <p>Solution of linear/linear simultaneous equations is expected (LP5).</p> <p>Interpretations of any solutions may be required in context or used to solve a given problem.</p> <p>The equation of an objective function may be requested.</p> <p>Spreadsheet notation is a requirement of this specification.</p>
LP2	Plot graphs of equations that correspond to straight line graphs in the coordinate plane; use the form $y = mx + c$ to identify parallel lines; find the equation of the line through two given points, or through one point with a given gradient	<p>Students should be confident in the drawing and interpretation of straight lines.</p> <p>Questions may be set in direct form or as part of a multi-step problem, for example these skills may be combined with content from SG4.</p>

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
LP3	Recognise, sketch and interpret graphs of linear functions	Interpretation may be required in context or as a comparison. Interpretation of a region bordered by a given straight line may be required including inequality notation. (Linking with LP8 and LP9).
LP4	Solve algebraically linear equations in one unknown with the unknown on both sides of the equation	May be set within a problem.
LP5	Solve two simultaneous equations in two variables (linear/linear) algebraically; find approximate solutions using a graph	May be set within a problem.
LP6	Solve linear inequalities in one variable, representing the solution on a number line using set notation	Rearrangement of inequalities with negative numbers is a requirement of this specification.
LP7	Solve linear inequalities in two variables, representing the solution on a graph	Identification of a feasible region is required. The confidence of students in LP2 will aid their success in this (LP7) content descriptor.

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
LP8	Use algebra to support and construct arguments	<p>Interpretation from algebraic solutions may be required in context or as a comparison. Arguments to assess the validity of a statement may also be required.</p> <p>Calculations may be a required to 'support/construct arguments.'</p>
LP9	Formulate problems as linear programs with up to three variables	<p>Students may be requested to use inequalities to formulate problems.</p> <p>Whilst three variables may be used in a problem, diagrams using 3-D coordinates are not required.</p>
LP10	Solve and interpret two-variable problems graphically, using ruler and vertex methods	Students may use a variety of methods to identify and test points of intersection.
LP11	Consider problems where solutions must have integer values.	Consider the solutions of minimum and maximum problems in real life context e.g. number of chairs and number of tables possible to purchase within a given budget.

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
Sequences and growth		
SG1	Set up, solve and interpret the answers to growth and decay problems, including compound interest	<p>All aspects of proportionality and ratio work referenced in GCSE Mathematics (Higher and Foundation) including increase, decrease and original value is included.</p> <p>May be included in problems and modelling. Interpretation in context may be required and comments on suitability/reliability of models may also be required.</p>
SG2	Calculate simple interest and compound interest; use and interpret graphical representation of simple and compound interest	<p>All aspects of proportionality and ratio work referenced in GCSE Mathematics (Higher and Foundation) including increase, decrease and original value is included.</p> <p>Interpretation of graphs and gradients in context may be set.</p>
SG3	Recognise, sketch and interpret graphs of quadratic functions, reciprocal functions, polynomial functions of the form $y = x^n$ and exponential functions $y = k^x$ for positive values of k	<p>These graphs are usually set in real life/modelling situations and so interpretation in context is often required.</p>

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
SG4	Interpret the gradient at a point on a curve as the instantaneous rate of change and apply the concepts of average and instantaneous rates of change (gradients of chords and tangents) in numerical and graphical contexts	<p>Students will be required to find the gradient of a curve at a point using a tangent, they will be expected to show their tangent to justify any calculations as part of their interpretation.</p> <p>Interpretations will often require context.</p> <p>Students should know the meaning of the word ‘chord’ when related to a graph.</p> <p>Calculus is not a requirement of this specification.</p>
SG5	Calculate with roots, and with integer and fractional indices	
SG6	Recognise and interpret linear and quadratic sequences; deduce expressions to calculate the n th term of linear and quadratic sequences	These are often in context.
SG7	Recognise, use and interpret sequences, including those given by a formula for the n th term, those generated by a simple relation of the form $x_{n+1} = f(x_n)$, Fibonacci sequences and the golden ratio	<p>These are often in context.</p> <p>Students are expected to be able to use and interpret any given formula for the nth term of a sequence.</p>

Spec ref.	Mathematics in Context content descriptor	Additional content guidance
SG8	Understand and use sigma notation	This notation is also shown on the formula sheet in the source booklet. 'Understand' may include interpretation of an aspect of this notation.
SG9	Recognise, use and interpret arithmetic series, including the general term of an arithmetic series and the sum to n terms of an arithmetic series	Appropriate formulae can be found in the source booklet.
SG10	Recognise, use and interpret geometric series, including the general term of a geometric series, the sum to n terms of a geometric series and the sum to infinity of a convergent geometric series including the use of $ r < 1$.	Appropriate formulae can be found in the source booklet. Students should be actively encouraged to use the formulae provided.