

Mathematics Department Response to Exam Board Guidance.

The Edexcel Advance Information can be downloaded from:

<https://qualifications.pearson.com/content/dam/pdf/Support/summer-2022-support/advance-info-as-a-level.zip>

A Level Mathematics

The primary focus for the papers will be:

Paper 1 Pure Mathematics

- Formal proof
- The factor theorem
- Understand and use graphs of functions
- Use intersection points of graphs to solve equations
- Transformations of a curve
- Use of functions in modelling
- The coordinate geometry of the circle
- Arithmetic sequences and series
- Differentiation: stationary points, minima. Radian measure
- Trigonometric identities and equations
- Trigonometric functions and identities: area under a curve
- Exponentials: Solving equations, rate of change
- Maximum point; iteration
- Integration as a limit
- Methods of integration
- Use vectors to solve a problem in pure mathematics

Paper 2 Pure Mathematics

- Formal proof
- The modulus of a linear function
- Understand and use function notation
- The binomial expansion
- Sequence generated by an iterative formula
- Geometric sequences and series; trigonometric identities
- Use of a trigonometric function
- The function a^x and its graph
- Differentiation; roots of equations
- Differentiation from first principles
- Find maximum and minimum points; Newton- Raphson method
- Differentiation of curves defined parametrically
- Area under a curve
- Solution of a first order differential equation; partial fractions
- The trapezium rule
- Use vectors to solve problems in pure mathematics

Paper 3 Statistics and Mechanics

Statistics:

- Regression lines (change of variable); hypothesis test for correlation
- Measures of central tendency and variation
- Probability and Venn diagrams
- Discrete probability distributions; normal approximation
- Normal distribution
- Hypothesis testing

Mechanics

- Constant acceleration in 2-D and Newton's 2nd law in 2-D using vectors
- Variable acceleration, language of kinematics
- Projectiles, constant acceleration
- Dynamics, resolving forces, friction, equilibrium
- Statics, moments, resolving forces, friction

Mathematics department response:

- The Exam Board Guidance has not identified any redactions
- The Exam Board Guidance does allow for revision to be targeted more specifically for each paper
- The Mock Exams for this subject will receive a similar guidance document to allow students to practice specialising their revision appropriately
- The mock exams have been scrutinised and questions that we feel are of a style that is highly likely to be examined in a similar way based on the Exam Board Guidance have been highlighted with a box so that students can specialise their "green pen" follow-up work and inform their revision
- Tuesday period 7 and Thursday period 7 interventions have each been given a targeted focus for question types that are known to be assessed this summer based on the exam board guidance as follows:

W/C	Tuesday period 7 (15:40-16:35)	Thursday period 7 (15:40-16:35)
21-Feb	Linear interpolation	vector $f=ma \rightarrow$ SUVAT
28-Feb	Mean and SD	Variable acceleration
7-Mar	Mock	Mock
14-Mar	Mock	Coordinate Geom Circle
21-Mar	Turning points with location of roots (iteration & Newt-Raph)	Methods of integration
28-Mar	Area under a curve	13 Parents eve
4-Apr	Easter	
11-Apr		
18-Apr		12 Parents eve
25-Apr	Trig identities	Harmonic form
2-May	Parametric diff (& integration)	Exponentials, solve eqtn, rates of change (a^x)
9-May	Transformation of graphs (how sin and cos related)	Int as a limit, trap rule, first principles
16-May	Contextual sequences (arithmetic)	geometric seq & recurrence relation

- Topics that we believe will be examined but are not addressed through targeted interventions will be targeted through lesson starters – this is usually because this was felt a more appropriate way to support these topics
- A new Wednesday period 4 intervention has been set up to provide an alternate support opportunity for Y12 students, further students and Y13 students requiring different support to allow for the targeting of the aforementioned period 7 interventions.

A Level Further Mathematics

The primary focus for the papers will be:

Further Mathematics Core Pure 1

- Complex numbers: Multiplication and division, conjugates
- Complex numbers: Roots of polynomial equations, Argand diagram
- De Moivre's theorem; Volumes of revolution
- Matrices: Inverse of a 3×3 matrix, singular and non-singular
- Method of differences for summation of finite series
- Improper integrals; Hyperbolic functions
- Integration; Partial fractions
- Inverse hyperbolic functions
- Solution of first order differential equations
- Solution of second order non-homogenous differential equations

Further Mathematics Core Pure 2

- Proof by induction; Use matrices to represent linear transformations in 2-D
- Complex numbers: Multiplication and division
- Complex numbers; Addition and subtraction; simple loci in the Argand diagram
- Matrices: Solution of three simultaneous equations
- The relationship between roots and coefficients of polynomial equations
- Differentiate inverse trigonometric functions
- Vectors; Equation of a straight line, scalar product, perpendicular distance from a point to a plane
- Polar coordinates: Area enclosed by a curve, tangents
- Differentiation of hyperbolic functions; Maclaurin series

Further Pure Mathematics FP1

- t -formulae
- Taylor series, limits, L'Hospital's Rule
- Differential equations reducible by means of a given substitution
- Coordinate systems: Ellipse and hyperbola
- Coordinate systems: Rectangular hyperbola
- Vector product
- Vector equations of planes
- Numerical solution of first order differential equations
- Algebraic inequalities and inequations including the modulus sign

Further Mechanics FM1

- Impulse-momentum in 1-D
- Impulse-momentum in 2-D
- Power
- Work-energy
- Hooke's law, work energy
- Successive direct impacts
- Oblique impact of two spheres
- Successive oblique impacts

Mathematics department response:

- The Exam Board Guidance has not identified any redactions
- A small number of topics are not specifically mentioned in the exam board guidance meaning they are unlikely to be assessed and should not have any greater importance than a minor focus in a question that is

otherwise primarily focussed on another area – our schemes of work were adjusted to deliver this material in a slightly accelerated manner in accordance with this reduced emphasis in the exam

- As with A Level Mathematics, the exam board guidance does offer opportunities for targeted revision
- The Further Mathematics group are on-course to complete the syllabus promptly and topics have been identified for targeted revision in lesson
- The additional Wednesday period 4 intervention has been timetabled to allow it to meet the support needs of the Further Mathematics students to mitigate lost support opportunities due to the targeting of the Tuesday and Thursday interventions
- Further Mathematics students also sit A Level Mathematics and benefit from all the support measures identified for that subject, as well.