FINISH

Pearson Edexcel 9MA0
Advanced Level Mathematics
examinations

Year 13 Term 4
Gap analysis

Key Stage 5 Mathematics 2023-2024

Year 13 Term 4 Prelims

YEAR 13 TERM 4
The normal distribution - use the normal distribution as an approximation to the binomial distribution, selecting the appropriate distribution, statistical hypothesis testing for the mean of the normal distribution.
Further kinematics - variable acceleration (use of calculus and finding vectors at a given time).

Year 13 Term 3 assessment

Year 13 TERM 3
Differentiation - differentiating sin x and cos x from first principles, differentiating exponentials and logarithms, differentiating products, quotients, implicit and parametric functions, second derivatives (rates of change of gradient, inflections), rates of change problems (including growth and kinematics).
Numerical methods - location of roots, solving by iterative methods (knowledge of staircase and cobweb diagrams), Newton-Raphson method, problem solving.
Integration - exponentials, trigonometric and parametrically defined functions, using the reverse of differentiation and using trigonometric identities to manipulate integrals, integration by substitution, integration by parts, use of partial fractions, areas under graphs, area as limit of a sum, the trapezium rule, differential equations.
Vectors - in three dimensions, column vectors, i, j and k unit vectors.
Applications of forces - dynamics of a particle. Further kinematics - constant acceleration (equations of motion in two dimensions and the i, j system).

Year 13 Term 2 Prelims

YEAR 13 TERM 2
Trigonometry and modelling - compound and double (and half) angle formulae, geometric proof of compound angle formulae, Rcos(x+α) or Rsin(x+α), proving trigonometric identities, solving problems in context.
Parametric equations - definition and converting between parametric and Cartesian forms, curve sketching and modelling.
Regression, correlation and hypothesis testing - change of variable, correlation coefficients, statistical hypothesis testing for zero correlation.
Conditional probability - using set notation for probability, questioning assumptions in probability.
The normal distribution - finding probabilities for normal distributions, the inverse normal distribution function, the standard normal distribution.
Projectiles - horizontal projection, horizontal and vertical components, projection at any angle, projectile motion formulae.
Applications of forces - equilibrium and statics of a particle (including ladder problems).

Year 13 Term 1 assessment

Year 13

YEAR 13 TERM 1
Algebraic methods - proof by deduction, exhaustion, disproof by counter example, simplifying algebraic fractions, partial fractions.
Functions and graphs - modulus function, composite and inverse functions, transformations, modelling with functions.
Sequences and series - arithmetic and geometric progressions, sigma notation, recurrence and iterations.
Binomial expansion - range of validity, expansion of functions by first using partial fractions.
Radians - arcs and sectors, small angles.
Trigonometric functions - secant, cosecant and cotangent, inverse trigonometrical functions.
Moments - forces and turning effect. **Forces and friction** - resolving forces, friction forces and the coefficient of friction.
United Kingdom Mathematics Trust (UKMT) **Senior Mathematical Challenge.**

Year 12 Term 6 Prelims

YEAR 12 TERM 5
Integration - definite integrals, areas under curves, areas under the x-axis, areas between curves and lines.
Exponentials and logarithms - exponential functions, exponential modelling, logarithms, laws of logarithms, solving equations using logarithms.
Probability - calculating probabilities, Venn diagrams, mutually exclusive and independent events, tree diagrams.
Statistical distributions - probability distributions, the binomial distribution, cumulative probabilities.
Variable acceleration - functions of time, using differentiation, maxima and minima problems, using integration, constant acceleration formulae.

Year 12 Term 5 assessment

YEAR 12 TERM 6
Exponentials and logarithms - working with natural logarithms, logarithms and non-linear data.
Hypothesis testing - finding critical values, one-tailed tests and two-tailed tests.

Year 12 Term 4 assessment

YEAR 12 TERM 4
Trigonometric ratios - solving triangle problems, graphs of sine, cosine and tangent, transforming trigonometric graphs.
Trigonometric identities and equations - angles in all four quadrants, exact values of trigonometric ratios, trigonometric identities, trigonometric equations and identities.
Differentiation - differentiating quadratics, differentiating functions with two or more terms, gradients, tangents and normal, increasing and decreasing functions, second order derivatives, stationary points, sketching gradient functions, modelling with differentiation.
Integration - indefinite integrals and finding functions.
Forces and Motion - connected particles and pulleys.

YEAR 12 TERM 2
Graphs and transformations - cubic graphs, quartic graphs, reciprocal graphs, points of intersection, translating graphs, stretching graphs and transforming functions.
Straight line graphs - equations of a straight line, y=mx+c, parallel and perpendicular lines, length and area, modelling with straight lines.
Circles - midpoints and perpendicular bisectors, equation of a circle, intersections of straight lines and circles, tangent and chord properties, circles and triangles.
Correlation and linear regression.
Vectors - representing vectors, magnitude and direction, position vectors, solving geometric problems, modelling with vectors.
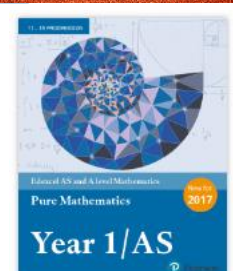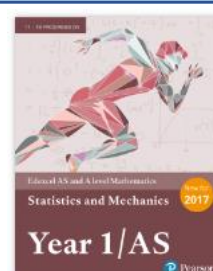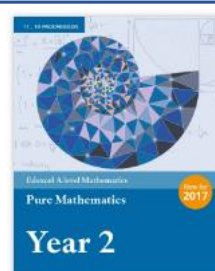
Year 12 Term 2 assessment

Year 12 Term 3 Prelims

YEAR 12 TERM 3
Algebraic methods - algebraic fractions, dividing polynomials, the factor theorem, mathematical proof, methods of proof.
The binomial expansion - Pascal's triangle, factorial notation, the binomial expansion, solving binomial problems, binomial estimation.
Trigonometric ratios - the cosine rule, the sine rule, areas of triangles.
Differentiation - gradients of curves, finding the derivative.
Forces and Motion - force diagrams, forces as vectors, forces and acceleration, motion in two dimensions.

Year 12

Year 12 Term 1 assessment

YEAR 12 TERM 1
Algebraic expressions, Quadratics, Equations and inequalities.
Data collection - populations and samples, sampling, non-random sampling, types of data, the large data set.
Measures of location and spread - measures of central tendency, other measures of location, measures of spread, variance and standard deviation, coding.
Representations of data - outliers, box plots, cumulative frequency, histograms, comparing data.
Modelling in mechanics - quantities and units, working with vectors.
Constant acceleration - displacement-time graphs, velocity-time graphs, constant acceleration formulae, vertical motion under gravity.

AO1 Use and apply standard techniques
AO2 Reason, interpret and communicate mathematically
AO3 Solve problems within mathematics and in other contexts

START

Statistics and Mechanics Year 2

Pure Mathematics Year 2

Statistics and Mechanics Year 1/AS

Pure Mathematics Year 1/AS

FINISH

Pearson Edexcel Level 3 Advanced GCE in Further Mathematics (9FM0) examinations

Year 13 Term 4
Gap analysis

Year 13 Term 4 Prelims

YEAR 13 FURTHER MATHEMATICS TERM 4
Preparation for Year 13 Term 4 examinations. Extension resources from Pearson Edexcel Advanced Extension Award in Mathematics (9811).

Year 13 Term 3 assessment

Year 13 FURTHER MATHEMATICS TERM 3
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 2
Modelling with differential equations and Polar coordinates.
Further Pure Mathematics 1
Numerical methods, Reducible differential equations and Conic sections 2.
Further Mechanics 1
Elastic collisions in two dimensions.

Year 13 Term 2 Prelims

YEAR 13 FURTHER MATHEMATICS TERM 2
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 2
Volumes of revolution, Hyperbolic functions and Methods in differential equations.
Further Pure Mathematics 1
Methods in calculus and Inequalities.
Further Mechanics 1
Elastic collisions in two dimensions.

Year 13 Term 1 assessment

YEAR 13 FURTHER MATHEMATICS TERM 1
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 2
Complex numbers, Series and Methods in calculus.
Further Pure Mathematics 1
Taylor series.
Further Mechanics 1
Elastic springs and strings.
United Kingdom Mathematics Trust (UKMT) **Senior Mathematical Challenge.**

Year 13

Year 12 Term 6 Prelims

YEAR 12 FURTHER MATHEMATICS TERM 5
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 1 / AS
Volumes of revolution
Core Pure Mathematics Book 2
Complex numbers
Further Pure Mathematics 1
Vectors and Numerical methods.
Further Mechanics 1
Momentum as a vector and Successive direct impacts.

Year 12 Term 5 assessment

YEAR 12 FURTHER MATHEMATICS TERM 6
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 2
Series.
Further Pure Mathematics 1
Conic Sections 2
Further Mechanics 1
Elastic springs and strings.

Year 12 Term 4 assessment

YEAR 12 FURTHER MATHEMATICS TERM 4
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 1 / AS
Vectors
Further Pure Mathematics 1
Vectors
Further Mechanics 1
Elastic collisions in one dimension.

YEAR 12 FURTHER MATHEMATICS TERM 2
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 1 / AS
Complex numbers, Matrices and Linear transformations.
Further Pure Mathematics 1
Conic Sections 1 and Inequalities.
Further Mechanics 1
Work energy and power.

Year 12 Term 2 assessment

Year 12 Term 3 Prelims

YEAR 12 FURTHER MATHEMATICS TERM 3
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 1 / AS
Series, Roots of Polynomials and Proof by induction.
Further Pure Mathematics 1
The t-formulae.
Further Mechanics 1
Power.

Year 12 Term 1 assessment

Year 12

YEAR 12 FURTHER MATHEMATICS TERM 1
Pre-requisite topics from Pearson Edexcel Level 3 Advanced GCE in Mathematics (9MA0).
Core Pure Mathematics Book 1 / AS
Complex numbers, Argand diagrams and Matrices.
Further Pure Mathematics 1
Conic Sections 1
Further Mechanics 1
Momentum and impulse

AO1 Use and apply standard techniques
AO2 Reason, interpret and communicate mathematically
AO3 Solve problems within mathematics and in other contexts

Year 12 Term 1

START

FM2 FM1 D1 FP1 Book 2 Book 1/AS