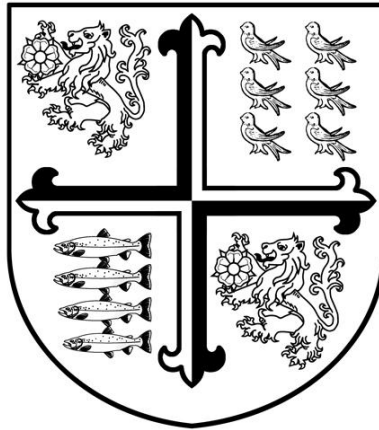




A Level Mathematics Exam Preparation

Exam Board: Pearson Edexcel

Specification: 9MA0

A level Mathematics Specification

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Year 12 Mathematics: Units and Assessment Criteria

Key information:

Teaching schedule

- Teacher A and Teacher B both teach Yr 1 Pure content, but different topics. It is not taught linearly. (i.e: In weeks 1 to 3, Teacher A covers Chapters 1 & 2 while Teacher B covers Chapter 7 and makes a start on Chapter 3).
- Once the Yr 1 Pure content is taught:
 - Teacher A covers mechanics (Yr 1 Applied Chapters 8 – 11)
 - Teacher B covers statistics (Yr 1 Applied Chapters 1 – 7)
- Once the Yr 1 Applied content is taught:
 - Teacher A covers Yr 2 Pure Chapters 2, 1 and 4 (starts mid-May)
 - Teacher B covers Yr 2 Pure Chapter 5 (starts mid-June)

Assessment schedule

- At the end of each Chapter there is a short assessment (dates given in document)
- The January formal assessment will be Pure content covered up to Christmas
- The Easter Mock exam will be a full Pure AS-level paper
- The June Applied Mock exam will be a full Applied AS-level paper

All exams taken in Yr 12 will count towards UCAS predicted grades

Teacher A

Unit and Duration	Criteria for Success	Assessment Information
Pure Year 1 Chapter 1 – Algebraic expressions w/c 7th September (and summer bridging unit) Manipulation of algebraic expressions	- You will be able to use index laws to manipulate and simplify expressions, including fractions - You will be able to expand double and triple brackets - You will be able to factorising expressions into single and double brackets fluently, being able to identify when to use each technique - You will be able to identify DOTS and perfect squares, and expand and factorise fluently - You will be able to work with negative and fractional indices, and be able to write expressions in index form - You will be able to solve simple equations using index manipulation - You will be able to simplify and manipulate surds - You will be able to rationalise denominators	In class test (~70% skills, ~30% problem solving): w/c 21st September (combined with Chapter 2)
Pure Year 1 Chapter 2 – Quadratics w/c 14 th September (and summer bridging unit) Expanding, factorising, and solving quadratics. Finding roots, turning points and sketching. An introduction to Domain and Range	- You will be able to solve quadratic equations by factorisation, quadratic formula and completing the square - You will understand what a mathematical function is, and the terms domain, range and root - You will be able to sketch quadratic graphs and label key points - You will be able to use the discriminant and its relationship with the number of roots of a quadratic function - You will be able to model real-life situations, including projectile motion, using quadratics	In class test (~70% skills, ~30% problem solving): w/c 21st September (combined with Chapter 1)
Pure Year 1 Chapter 5 – Straight Line Graphs w/c 28th September (and summer bridging unit) Working with linear graphs, finding equations, parallel and perpendicular lines	- You will be able to find the gradient of a line or line segment, and use the gradient to solve problems - You will be able to find the equation of a line using the formula $y - y_1 = m(x - x_1)$ - You will be able to find the equation of parallel and perpendicular lines - You will be able to find the length of line segment between two points - You will be able to solve problems involving area on a Cartesian grid	In class test (~70% skills, ~30% problem solving): w/c 5th October

	You will be able to model real-life situations using linear models	
Pure Year 1 Chapter 6 – Circles w/c 12th October Coordinate geometry of circles, intersections, use of circle theorems	- You will be able to find the midpoint of a line segment - You will be able to find the equation of perpendicular bisectors - You will be able to find the equation of a circle, and solve problems using it - You will be able to find the intersection of lines and circles, and use the discriminant to determine the number of intersections - You will be able to use properties of tangents and chords - You will be able to use circle theorems to solve problems involving circles and lines on a coordinate grid	In class test (~70% skills, ~30% problem solving): w/c 19th October
Pure Year 1 Chapter 9 – Trigonometric Ratios w/c 2 nd November Trigonometry for triangles (sine rule, cosine rule, sine rule for area), trigonometric graphs	- You will be able to use cosine rule to find a missing side or angle - You will be able to use sine rule to find a missing side or angle, being careful of ambiguous cases - You will be able to find the area of any triangle - You will be able to select and use the appropriate formulae to solve problems involving triangles - You will know and be able to sketch accurately the graphs of trigonometric functions, knowing key points, periods, asymptotes - You will be able to transform and sketch accurate trigonometry graphs	In class test (~70% skills, ~30% problem solving): w/c 16th November
Pure Year 1 Chapter 10 – Trigonometric Identities and Equations w/c 16th November Trigonometric identities, solving trigonometric equations within a given range	- You will be able to calculate the sine, cosine or tangent of any angle - You will be able to manipulate angles to write in terms of acute angles using trigonometric identities - You will be able to show and know the exact values of key trigonometric ratios - You will be able to use key trigonometric identities to prove other identities, simplify expressions and find exact values of trigonometric ratios - You will be able to solve simple trigonometric equations, finding all solutions within the given range	In class test (~70% skills, ~30% problem solving): w/c 30th November Homework – textbook and/or Dr Frost

	You will be able to solve harder trigonometric equations that involve rearrangement or use of identities	
Pure Year 1 Chapter 12 – Differentiation w/c 7th December Introduction to calculus and gradient functions, tangents and normal, turning points, modelling	- You will be able to calculate the sine, cosine or tangent of any angle - You will be able to manipulate angles to write in terms of acute angles using trigonometric identities - You will be able to show and know the exact values of key trigonometric ratios - You will be able to use key trigonometric identities to prove other identities, simplify expressions and find exact values of trigonometric ratios - You will be able to solve simple trigonometric equations, finding all solutions within the given range - You will be able to solve harder trigonometric equations that involve rearrangement or use of identities	In class test (~70% skills, ~30% problem solving): w/c 1st February (combined with Chapter 13)
Pure Year 1 Chapter 13 – Integration w/c 18th January Integration as the inverse of differentiation, finding areas	- You will be able to find y given dy/dx - You will be able to integrate polynomials - You will be able to rewrite a function using indices to be able to integrate it - You will be able to find $f(x)$, given $f'(x)$ and a point on the curve - You will be able to evaluate a definite integral - You will be able to find the area bounded by a curve and the x-axis - You will be able to find areas underneath the x-axis - You will be able to find areas bounded by curves and straight lines	In class test (~70% skills, ~30% problem solving): w/c 1st February (combined with Chapter 12)
Applied Year 1 Chapter 8 – Modelling in Mechanics w/c 8th February Introduction to mathematical modelling, common assumptions, SI units and quantities	- You will be able to find y given dy/dx - You will be able to integrate polynomials - You will be able to rewrite a function using indices to be able to integrate it - You will be able to find $f(x)$, given $f'(x)$ and a point on the curve - You will be able to evaluate a definite integral - You will be able to find the area bounded by a curve and the x-axis - You will be able to find areas underneath the x-axis	In class test (~70% skills, ~30% problem solving): w/c 8th March (Combined with Chapter 9)

	You will be able to find areas bounded by curves and straight lines	
Applied Year 1 Chapter 9 – Constant Acceleration w/c 1st March Kinematic graphs, deriving results from graphs, constant acceleration formulae	- You will be able to find y given dy/dx - You will be able to integrate polynomials - You will be able to rewrite a function using indices to be able to integrate it - You will be able to find $f(x)$, given $f'(x)$ and a point on the curve - You will be able to evaluate a definite integral - You will be able to find the area bounded by a curve and the x-axis - You will be able to find areas underneath the x-axis - You will be able to find areas bounded by curves and straight lines	In class test (~70% skills, ~30% problem solving): w/c 8th March (Combined with Chapter 8)
Applied Year 1 Chapter 10 – Forces and Motion w/c 15th March Forces, diagrams, Newton's laws, connected objects	- You will be able to draw force diagrams and calculate resultant forces (ΣF) - You will be able to understand and use Newton's 1st Law - You will be able to calculate resultant vectors in 2D - You will be able to understand and use Newton's 2nd Law, $\Sigma F = ma$ - You will be able to apply Newton's 2nd Law to vector forces and acceleration - You will be able to understand and use Newton's 3rd Law - You will be able to solve problems involving linear connected particles - You will be able to solve problems involving connected particles and pulleys	In class test (~70% skills, ~30% problem solving): w/c 26th April
Applied Year 1 Chapter 11 – Variable Acceleration w/c 3rd May Displacement, Velocity and Acceleration as functions of time when acceleration is not constant	- You will be able to understand that displacement, velocity and acceleration may be given as functions of time - You will be able to use differentiation to solve kinematics problems - You will be able to use calculus to solve problems involving maxima and minima - You will be able to use integration to solve kinematics problems - You will be able to use calculus to derive constant acceleration formula	In class test (~70% skills, ~30% problem solving): w/c 17th May

Pure Year 2 Chapter 1 – Algebraic methods w/c 17th May More proof, algebraic fractions, partial fractions, improper algebraic fractions	• You will be able to use proof by contradiction to prove true statements • You will be able to multiply and divide two or more algebraic fractions • You will be able to add or subtract two or more algebraic fractions • You will be able to convert an expression with linear factors in the denominator into partial fractions • You will be able to convert an expression with repeated linear factors in the denominator into partial fractions • You will be able to divide algebraic expressions • You will be able to convert an improper fraction into partial fraction form	In class test (~70% skills, ~30% problem solving): w/c 7th June (Yr 12)
Pure Year 2 Chapter 2 – Functions and Graphs w/c 15th June The modulus function, mappings and functions, domains and ranges, composites and inverses, transformations of functions	• You will be able to understand and use the modulus function • You will be able to sketch modulus function graphs and solve modulus equations • You will be able to understand mappings and functions, and use domain and range • You will be able to combine two or more functions to make a composite function • You will be able to find the inverse of a function graphically and algebraically • You will be able to sketch the graphs of the modulus functions $y = f(x)$ and $y = f(x)$ • You will be able to apply a combination of two (or more) transformations to the same curve • You will be able to transform the modulus functions	In class test (~70% skills, ~30% problem solving): w/c 28th June (Yr 12)

Teacher B

Unit and Duration	Criteria for Success	Assessment Information
Pure Year 1 Chapter 7 – Algebraic Methods w/c 7 th September Algebraic fractions, factor and remainder theorem, dividing polynomials, methods of proof	- You will be able to cancel factors in algebraic fractions - You will be able to divide a polynomial by a linear expression using long division and equating coefficients - You will be able to use factor theorem to fully factorise cubic and quartic expressions expression - You will be able to prove identities and construct mathematical proofs of statements using algebra - You will be able to use proof by exhaustion - You will be able to disprove by counter-example	In class test (~70% skills, ~30% problem solving): w/c 21st September
Pure Year 1 Chapter 3 – Equations and Inequalities w/c 21 st September Solving simultaneous equations, solving inequalities, and using the discriminant	- You will be able to solve linear simultaneous equations by elimination or substitution - You will be able to solve non-linear simultaneous equations by substitution - You will be able to solve simultaneous equations graphically - You will be able to use the discriminant of a resulting quadratic equation to determine the number of solutions - You will be able to solve linear inequalities - You will be able to solve quadratic inequalities - You will be able to use set notation - You will be able to represent inequalities on graphs	In class test (~70% skills, ~30% problem solving): w/c 12th October
Pure Year 1 Chapter 4 – Graphs and Transformations w/c 19 th October Sketching polynomial functions, reciprocals, using graphs to find solutions, and transforming functions	- You will be able to sketch cubic graphs and label key points - You will be able to sketch quartic graphs and label key points - You will be able to sketch reciprocal graphs, and label key points and asymptotes - You will be able to relate the points of intersection of $y = f(x)$ and $y = g(x)$ to the equation $f(x) = g(x)$ - You will be able to translate graphs of functions - You will be able to stretch graphs of functions - You will be able to reflect graphs of functions - You will be able to transform unfamiliar functions by considering the movement of specific points	In class test (~70% skills, ~30% problem solving): w/c 2nd November

Pure Year 1 Chapter 8 – The Binomial Expansion w/c 9th November Expanding binomial expressions with positive, integer powers, estimating values	• You will be able to use Pascal's triangle to identify binomial coefficients • You will be able to expand simple binomial expressions • You will be able to use the "choose" function and factorials to find binomial coefficients for any term • You will be able to solve problems involving binomials, including finding missing terms or missing powers • You will be able to use binomial expansions and a suitable substitution to find an approximation for values raised to powers	In class test (~70% skills, ~30% problem solving): w/c 16th November
Pure Year 1 Chapter 11 – Vectors w/c 23rd November Position and displacement vectors, magnitude and direction, geometric problems	• You will be able to use vectors in 2 dimensions in both Cartesian and column form • You will be able to use the triangle law for addition and subtraction of vectors • You will be able to solve problems involving parallel vectors • You will be able to use column vectors and carry out arithmetic operations on vectors • You will be able to calculate the magnitude and direction of a vector • You will be able to understand and use position vectors • You will be able to use vectors to solve geometric problems • You will be able to understand vector magnitude and use vectors in speed and distance calculations • You will be able to use vectors to solve problems in context	In class test (~70% skills, ~30% problem solving): w/c 7th December
Pure Year 1 Chapter 14 – Exponentials and Logarithms w/c 14th December Exponential and Logarithmic functions and equations, the graphs and their transformations, solving equations, modelling	• You will be able to sketch graphs of the form $y = a^x$, $y = e^x$ and transformations of these • You will be able to differentiate e^{kx} and use this result • You will be able to use and interpret models that use exponential functions • You will be able to recognise the relationship between exponents and logarithms • You will be able to sketch graphs of the form $y = \ln x$, $y = \log x$ and transformations of these • You will be able to recall and apply the laws of logarithms • You will be able to solve exponential and logarithmic equations • You will be able to use natural logarithms	In class test (~70% skills, ~30% problem solving): w/c 25th January

	You will be able to use logarithms to estimate the values of constants in non-linear models of the forms $y = ab^x$ and $y = ax^b$	
Applied Year 1 Chapter 1 – Data Collection w/c 1st February Sampling techniques, their advantages and disadvantages, types of data, The Large Data Set	- You will understand “population”, “census” and “sample”, and comment on the advantages and disadvantages of each - You will understand the advantages and disadvantages of different sampling types: Simple random, Systematic, Stratified, Quota and Opportunity - You will be able to define qualitative, quantitative, discrete and continuous data, and understand grouped data - You will be able to understand the large data set, how to collect from it, identify types of data, and calculate simple statistics	In class test (~70% skills, ~30% problem solving): w/c 8th February
Applied Year 1 Chapter 2 – Measures of Locations and Spread w/c 22nd February Ways of representing data, their advantages and disadvantages, outliers, variance and standard deviation	- You will be able to calculate different measures of central tendency from data in raw or tabulated form - You will understand the advantages and disadvantages of different averages - You will be able to calculate measures of location, such as quartiles, median and percentiles, including in grouped data (by interpolation) - You will be able to calculate measures of spread, such as range, interquartile range, and interpercentile range - You will be able to calculate variance and standard deviation - You will understand and be able to use coding	In class test (~70% skills, ~30% problem solving): w/c 8th March
Applied Year 1 Chapter 3 – Representations of Data w/c 8th March Displaying data in diagrams, interpreting diagrams, comparing data sets	- You will be able to identify outliers in data sets - You will be able to clean data to remove the affect of anomalous data - You will be able to draw and interpret box plots - You will be able to draw and interpret cumulative frequency diagrams - You will be able to draw and interpret histograms - You will be able to compare two data sets	In class test (~70% skills, ~30% problem solving): w/c 22nd March
Applied Year 1 Chapter 4 – Correlation w/c 22 nd March Correlation and lines of regression	- You will be able to draw and interpret scatter diagrams for bivariate data - You will be able to interpret correlation and understand that it does not imply causation	In class test (~70% skills, ~30% problem solving): w/c 3rd May (combined with Chapter 5)

	- You will be able to interpret the coefficients of a regression line equation for bivariate data - You will understand when you can use a regression line to make predictions	
Applied Year 1 Chapter 5 – Probability w/c 26th April Probability vocabulary, Venn diagrams, tree diagrams, conditional probability	- You will understand key terms such as “experiment”, “outcomes” and “events” - You will be able to calculate probabilities for single events - You will be able to draw and interpret Venn diagrams - You will be able to understand mutually exclusive and independent events - You will be able to determine whether two events are independent - You will be able to understand and use tree diagrams	In class test (~70% skills, ~30% problem solving): w/c 3rd May (combined with Chapter 4)
Applied Year 1 Chapter 6 – Statistical Distributions w/c 10th May Probability mass functions, binomial distributions	- You will be able to understand and use simple discrete probability distributions, including the discrete uniform distribution - You will be able to use probability mass functions to find probabilities of outcomes - You will be able to understand the binomial distribution as a model and comment on appropriateness - You will be able to calculate individual probabilities for the binomial distribution - You will be able to calculate cumulative probabilities for the binomial distribution	In class test (~70% skills, ~30% problem solving): w/c 17th May
Applied Year 1 Chapter 7 – Hypothesis Testing w/c 31st May Hypothesis testing for a Binomial distribution	- You will be able to understand the language and concept of hypothesis testing - You will be able to understand that a sample is used to make an inference about a population - You will be able to find critical values of a binomial distribution using tables - You will be able to carry out a one-tailed test for the proportion of the binomial distribution and interpret the results - You will be able to carry out a two-tailed test for the proportion of the binomial distribution and interpret the results	In class test (~70% skills, ~30% problem solving): w/c 7th June

Pure Year 2 Chapter 4 – Binomial expansion w/c 21st June Expanding binomial expressions with rational and/or negative powers, estimating values	• You will be able to expand $(1 + x)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid • You will be able to expand $(a + bx)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid • You will be able to use partial fractions to expand fractional expressions • You will be able to use a binomial expansion to estimate the values raised to rational powers	In class test (~70% skills, ~30% problem solving): w/c 12th July (Yr 12)
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