THOMAS ALLEYNE`S HIGH SCHOOL

A level Mathematics LEARNING JOURNEY

OPPORTUNITY · PROGRESS · INDIVIDUALITY

University

POST-18 PATHWAY

Higher Apprenticeships

Year 13

Final Exams

Applications of Forces
Further Kinematics
Sequences & Series
Vectors 2

The mechanics module concludes with equilibrium and statics of a particle, dynamics of a particle, followed by further work on constant and variable acceleration. Students learn about arithmetic and geometric sequences as well as sigma notation and recurrence relations. Vectors are extended into 3D.

Assessment Point 4

Statistical Distributions 2
Binomial Theorem
Numerical Methods

In Y13 continuous distributions are covered through the normal distribution to calculate probabilities, as an approximation to the binomial distribution and hypothesis testing for the mean of a normal distribution. The Binomial Theorem is extended from Y12 to include negative and fractional powers. In numerical methods students learn how to locate roots, use iteration and Newton-Raphson method.

Assessment Point 3

Moments
Forces & Friction
Projectiles

The mechanics module continues by studying forces turning effects, resolving forces and using the coefficient of friction. It then moves onto projectiles

Assessment Point 2

Trigonometry 2
Parametric Equations
Differentiation 2

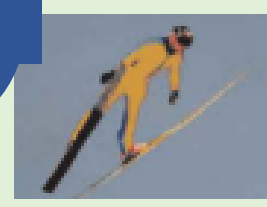
Mock Exam

Integration 2

Assessment Point 1

Correlation & Regression
Probability 2

The trigonometry unit starts with an introduction to radians as a unit of angle measurement. It then builds on the work completed in Y12 – students will learn more trig identities and use them to prove and solve trig identities and equations. Students will convert between parametric and cartesian equations. They will extend the differentiation work from Y12 to include differentiating products, quotients, implicit and parametric functions as well as trig , exponential and logarithmic functions.



This unit is started in Y12 and continues into Y13. Students extend their work on algebra by simplifying algebraic fractions and using partial fractions. They will learn how to prove by deduction and by contradiction. Students will learn about the domain and range of functions, the modulus function, composite and inverse functions and extend the work on transformations of graphs.

Students will extend the integration work form Y12 to include integrating by reverse chain rule, substitution and by parts. They will learn to integrate trig, exponential and log functions, as well as using partial fractions and the trapezium rule. Differential equations will be introduced.

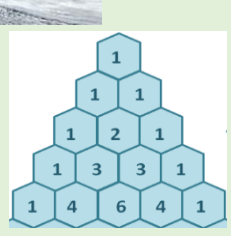
The statistics module continues by calculating correlation coefficients and hypothesis testing for zero correlation. Probability is extended to include set notation and conditional probability.

Algebraic & Partial Fractions
Proof
Functions & Modelling

Y12 Trial Exams

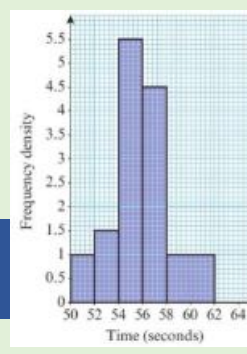
Statistical Hypothesis Testing 1
Forces & Newton's Laws
Kinematics 2

Exponentials & Logs
Integration 1
Statistical Distributions



Students are introduced to the language and notation of hypothesis testing and complete hypothesis tests using the Binomial distribution. The mechanics module continues with using Newton's first, second and third laws to solve problems in equilibrium, with connected particles and pulleys. It then extends onto solving problems with variable acceleration.

Students will study exponential functions and learn how to use the laws of logs to solve equations, including natural logarithms. Integration is used to calculate the area under a curve, students will work with both indefinite and definite integrals. In Y12 discrete distributions are covered in the form of discrete random variables, the uniform distribution and the Binomial distribution.

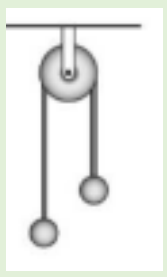


Assessment Point 4

Trigonometry 1
Vectors 1
Quantities & Units in Mechanics
Kinematics 1

Assessment Point 3

Differentiation 1
Data Presentation & Interpretation 2
Probability 1



The trigonometry unit recaps the work from GCSE on trig ratios and trig graphs but then extends this into using trig identities and solving trig equations. 2D vectors are studied at this point of the course. Students begin the mechanics module learning about force, velocity, acceleration and displacement, they represent these graphically as well as using the suvat equations to solve problems with constant acceleration.

Differentiation is used to find the gradient at a point on a curve. Students will differentiate polynomials to find gradients and normal to curves as well as maxima and minima. They will also learn how to differentiate from first principles and find second derivatives. The statistics module continues with drawing and interpreting cumulative frequency graphs, box plots, histograms, scatter graphs and formally identifying outliers. Two-way tables, Venn diagrams and tree diagrams are all covered in the probability topic.

Assessment Point 2

Algebra & Functions 2
Further Algebra
Statistical Sampling
Data Presentation & Interpretation 1

Assessment Point 1

Algebra & Functions 1
Coordinate Geometry

Year 12

Transition days and Bridging work

The work on graphs is extended to include cubic, quartic and reciprocal graphs, as well as graphical transformations. Students learn how to complete algebraic division, to use the factor theorem and are introduced to algebraic proof. Binomial expansion builds on the work completed on expanding brackets, using Pascals triangle and combinations. Students begin the statistics module learning about different sampling techniques. They build on the work completed at GCSE on averages by studying different measures of location and variation. The large data set (weather) is introduced and is used throughout the statistics module.

The first units in Year 12 recap and build on the algebra topics covered at GCSE – algebraic manipulation, indices & surds, quadratic functions, simultaneous equations, inequalities, straight line graphs and circle geometry

WELCOME