Spring Term plan

Year 13 Mathematics A Level Spring Term

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<tr><th>Mrs Laidler</th><th>Mr Bullock/Mr Ahluwalia</th></tr>
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Mechanics

Kinematics

- Use the constant acceleration formulae in two dimensions using vectors
- Use calculus to solve problem in two dimensions with variable acceleration
- Solve problems involving motion of a projectile under gravity

Statics

Understanding that there is a maximum value that Friction can take when an object is on the point of moving. Finding unknown forces when a system is at rest.

Dynamics

Finding unknown forces when a system has constant acceleration, including the use of the SUVAT equations.
Solving differential equations arising from F=ma

Moments

Looking at taking moments about points and resolving to find unknown forces in a static situation

Mechanics revision, test and feedback – open book

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Statistics

- Use correlation coefficients as measures of how close data points lie to a straight line and be able to interpret a given correlation coefficient using a given p-value or critical value (calculation of correlation coefficients is excluded)
- Conduct a statistical hypothesis test for the mean of a Normal distribution with known, given or assumed variance and interpret the results in context.
- Interrogate and apply statistical knowledge to the large data set

Statistics revision, test and feedback – open book

Core

Numerical Methods

- Locate roots of f(x) = 0 by considering changes of sign of f(x) in an interval of x on which f(x) is sufficiently well-behaved
- Understand how change of sign methods can fail
- Solve equations approximately using simple iterative methods; be able to draw associated cobweb and staircase diagrams.
- Solve equations using the Newton-Raphson method and other recurrence relations of the form
- $x_{n+1} = g(x_n)$.
- Understand how such methods can fail

- Understand and use numerical integration of functions, including the use of the trapezium rule and estimating the approximate area under a curve and limits that it must lie between.
- Use numerical methods to solve problems in context

Proof

Proof by contradiction (including proof of the irrationality of root 2 and the infinity of primes, and application to unfamiliar proofs)

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Formal mocks will take place at the end of February.
End of content – Review and preparation for summer assessments begin. This will include past papers to help bring all the topics together and help with increasing fluency of the work covered over the last two years.

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