



Year 13 Applied Mathematics	Working towards expected outcomes Your child is not yet making the expected progress within this course.	Working at expected outcomes Your child is achieving the expected progress for this point within the course.	Working beyond expected outcomes Your child is exceeding the expected progress.
Autumn Term	<p>Students working towards expected outcomes in Y13 can:</p> <ul style="list-style-type: none">• Use the basic definition of a moment and apply the formula $\text{moment} = \text{force} \times \text{perpendicular distance}$• Resolve forces vertically and horizontally in simple statics problems• Understand correlation in real-life contexts and calculate PMCC using a calculator• Use coding to linearise data in exponential models• Understand set notation and basic probability language (n, U, A')	<p>Students working at expected in Y13 can:</p> <ul style="list-style-type: none">• Solve equilibrium problems involving rods, beams and laminae with multiple supports• Handle non-uniform rods and apply the principle of moments to ladder problems• Perform hypothesis tests for correlation using p-values or critical values and interpret conclusions in context• Use coding techniques to derive and interpret regression equations for exponential models• Solve complex probability problems involving conditional events using Venn diagrams and tree diagrams	<p>Students working beyond expected in Y13 can: In addition to the skills listed under 'Working At' for this topic, students working beyond expected outcomes can:</p> <ul style="list-style-type: none">• Tackle unfamiliar ladder and tilting problems• Interpret the implications of statistical testing and correlation strength in nuanced real-world settings• Identify misleading uses of correlation and evaluate limitations of modelling using regression lines• Combine tree diagram and Venn diagram methods in multi-step probability problems• Make evaluative decisions about modelling assumptions in complex equilibrium problems



Spring Term

- Draw tree diagrams and use basic conditional probability from tables

Students working **towards** expected outcomes in Y13 can:

- Recognise the shape and key properties of the normal distribution curve
- Use a calculator to find probabilities and inverse values in normal distribution contexts
- Recall and apply basic kinematics formulae to horizontal and vertical motion under gravity
- Use vector notation for constant acceleration
- Differentiate and integrate vector functions with constant coefficients

- Apply the conditional probability formula correctly in unfamiliar settings

Students working **at** expected in Y13 can:

- Solve hypothesis testing problems using the normal distribution and interpret results clearly in context
- Apply continuity corrections when approximating binomial distributions with the normal
- Solve projectile motion problems with angle and height, using suvat in horizontal and vertical components
- Use integration and differentiation with vector functions in kinematics, including initial conditions and vector constants
- Convert between standard normal and general normal distributions

Students working **beyond** expected in Y13 can:

- Solve normal hypothesis testing questions involving unknown parameters using simultaneous equations
- Apply calculus to determine maximum height, range, or impact angle in projectile motion
- Integrate vector acceleration functions involving time to derive position vectors, applying conditions to find constants
- Work backwards from outcomes (e.g. range, time) to deduce unknown parameters in projectile and vector motion problems
- Articulate and critique the assumptions made in projectile models and evaluate model suitability

